# The Mooney Flyer

The Official Online Magazine for the Mooney Community

November 2012

# Contents

## Features



## In Every Issue




**Editors**
Phil Corman
Jim Price

**Contributing Writers**
Bob Kromer
Tom Rouch
Paul Loewen
Linda Corman

**To Subscribe**
Click Here

To Advertise
Click Here

To Submit an Article
Click Here

Click Here to Subscribe Click Here For Back Issues

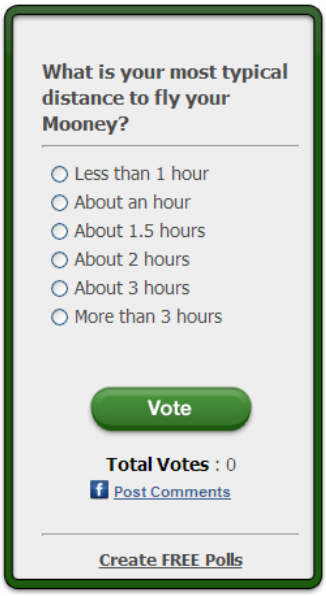
# From the Editor

**Phil Corman**


We are constantly keeping our eye on Mooney. As you know, Bob Kromer has written several times in **The Mooney Flyer** about a "restart strategy" for Mooney, namely a refurbish line for J's and K's. Having the ability to buy essentially a new airplane at a fraction of the cost for current long bodies seems like a no brainer to us. Now AVweb reports on a new industry-wide initiative.

The Three R's Affordable Aircraft Initiative is taking shape--and now over 40 General Aviation Companies and organizations are onboard. Our goal is to encourage our industry to acquire and deliver rebuilt, restored and re-equipped aircraft that meet high standards of quality, affordability, appraised value, insurability and financing. We meet at NBAA next week in Orlando, October 31st at 2PM, room N220A near the press room. Soon, at least two proof of concept airplanes will undergo a Three R's rebuild.

We continue to wonder why the current owners of Mooney are sitting on the factory without action.




We are curious how far Mooney owners take their planes when they go flying. We know that periodically you will go on a long trip. Likewise, you may also just takeoff, burn some holes in the sky and land. But how far do you fly most typically? We are curious. We have some data from fly-ins, but wanted a larger audience. Click Here to take the poll.

It's not Mooney related, but here is a fantastic video of the Space Shuttle tour of Southern California. Click Here to view it. A great tour of the Los Angeles basin

***News Flash – iPad Mini, "What You Need to Know"***

The iPad mini was announced as we were going to press, so I thought I'd add a few thoughts and facts. Here are the facts. It has a 7.9 inch screen, as opposed to the 9.7 inch found on all the other iPads. The iPad mini is .67 lbs and 2.8 inches thick. It is small enough to be held in your hand. It also fits nicely on the yoke of my Mooney, an M20S. It has 1024 x 768 pixels on its screen, which disqualifies it as being the Apple Retina display, which is 2048 x 1536 pixels. All iPad apps run on the iPad mini as it's basically an older ipad with the same pixels on a smaller screen, so it has more pixels per inch. It uses the same processor, the A5, as used on the iPad 2. So buyers need to realize that it is an older processor, and therefore will become void of Apple support in the same timeframe as the iPad 2. The mini is essentially two generations old. Apple unfortunately has already dropped support for the iPad 1 which is only 2 years old. Having an older processor means having a shorter support life. Don't be confused by the new fourth generation iPad, also announced on October 23. The pricing for a 16GB WIFI model is $329 and they top out at $659 for a 64GB WIFI+Cellular. We recommend a minimum of 32GB to run the typical suite of Aviation apps such as Foreflight, WingX, etc. including databases. It'll also give you enough headroom for your non-aviation life. That is, if you have such as life.

We received a few requests from readers who are not yet owners of Mooneys, asking for two things. First, they wanted an overview of the differences between the M20 models, and secondly, they asked what the Cost of Ownership is for a Mooney since there is a lot of "folk ware" out there regarding this topic. We are handling the first question in a three-part series entitled "So You are Considering a Mooney". In Part 1, we're focusing on the Short Body Mooneys, models A thru E. In part 2 and 3, we'll cover the Medium Body and Long Body Mooneys. The second question we were asked concerns the cost of owning a Mooney. We handle this question in What Does it Cost to own a Mooney? We even provide an Excel spreadsheet which readers can download to tailor costs for their specific Mooney. Because of the economy, vintage Mooneys can be had for a good price. According to Jimmy Garrison of All American, the J model continues to be the most sought after. You can also use the Mooney Appraisal app, below, to figure out what your particular Mooney's market value may be.

There are several online forums and mailing lists that cover Mooneys. This month, we highlight MooneySpace which is open to everyone and is the only modern forum dedicated to Mooneys. Check out the details featured in this issue's Website of the Month. Other online sources include the Mooney list and the Mooney-Tech lists. The Mooney list is for most any topic and the Mooney-tech list is more focused on technical topics. You can get more info at http://lists.aviating.com/mailman/listinfo. The other mailing list is the mapalist. You must be a member of MAPA to join this list. Our assessment and review of these sources points to MooneySpace as the easiest to navigate, the most modern, and by far, the most open. There also seems to be more active involvement from a broader Mooney pilot/owner base on MooneySpace.

We continually lament over the declining population of certificated pilots. Here's an excerpt from an AOPA publication - *From Aircraft Owners and Pilots Association President Craig Fuller at the Southeast Aviation Expo in Greenville, S.C., last month: Over the last 20 years, the pilot population in the United States has dropped from 800,000 to 600,000 — and it keeps shrinking.*

*It gets worse: As referenced in a recent post from Charles Spence, our Washington, D.C., correspondent, the **active pilot population in the U.S. is below 200,000**, and about 10,000 pilots are lost every year. Much of this is blamed on the costs of buying and operating an airplane, according to industry officials.*

Equally disconcerting is that existing pilots are flying far less. While talking with the founder of a well-known MSC, he told The Mooney Flyer that he has 3 Mooneys in current annual. One flew only 20 hours over the past year, and the most was about 60 hours. This is way down from the history of these aircraft. For current owners, it must be costs, as the weather was pretty typical over the course of the year. Even though fuel costs are far from the largest cost to operate our Mooneys, the price of 100LL has a huge emotional impact on hours flown.

## 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.


M20C M20E M20G M20F M20J
Updated September 2012


MooneySpace.com

We love Mooneyspace.com for a lot of reasons. First and foremost, it is the only "Forum" dedicated to lovers of Mooney Aircraft. Other Mooney social media sites are based on "Mailing Lists". These require those that participate to receive emails on each and every participant's thread. This adds up quickly and forces you to deal with threads that do not hold your interest. The second thing we love about MooneySpace is that it is completely "open" to any and all lovers of Mooney aircraft. Unlike other forums on other topics, the posts and replies mostly seem to stay on topic and the flames are kept to a minimum. And the best thing is that MooneySpace just got a facelift to a faster and more powerful software engine that makes using MooneySpace even more useful. The site is user-supported. The founder and main sysop is Craig. He is dedicated and very good at driving MooneySpace software.


There are several forums available to the browsers of this site. You can see the main forums below. There are also Group Specific forums and a Trading Post for buying/selling aircraft and parts.

The site is FREE and boasts a little over 2400 users, at the time of this writing.

Click Here to register and begin sharing your Mooney stuff with this fantastic community.


## Mooney Mail

**What's All the Flaps About**

Here's a commentary regarding use of flaps on the Mooney. I noticed a Mooney owner changing a tire that appeared new. Under closer inspection it was revealed that the tire had a flat spot with chord showing. Observation of the other tire revealed several lesser flat areas.

I offered my services to perform some landing instruction/practice. It became quickly apparent that the pilot was consistently approaching at higher than optimum speed and with full flap extended touchdown after the long float was punctuated by intermittent braking on the "shortish" runway with an occasional screech from the skidding tires clearly audible even through the noise cancelling headsets as the wheels intermittently left the ground and locked.

The Mooney flaps are more useful for providing a better view of the runway than steepening/slowing the approach (bless the advent of speed brakes). Even a minimal reduction in stall speed is useful. Gear down/take off flaps is a great set up for instrument approaches. This event and takeoff is about the only time I will use less than full flaps, excluding certain wind conditions

In 1968 the Mooney factory pilot showed me that dumping the flaps when the wheels touch ground provides better braking by transferring more weight to the wheels. It minimizes the extra lift generated under the wing because of air trapped and compressed between the ground and the lowered flap due to the low stance of the Mooney. If you touch down with even a little extra speed this condition can cause the wheels to skip and lock as you brake.

As we all know the idea behind the ideal landing is to touch down with absolutely minimal lift being generated by the wing. Full stall landings are certainly not de-rigueur in high performance aircraft, but minimizing lift at the moment ground contact will certainly save your tires and provide better braking.

I have taught students in Mooneys, since 1968, to **move the hand to the flap lever once the throttle is closed upon landing**, the flaps are removed **upon wheel contact.** Yes, I get some verbal "back pressure" regarding the ancient litany of "don't touch anything until you clear the runway". This stems from WW2 flight training (took mine just after) when military aircraft had the flap lever placed adjacent to the landing gear knob (sometimes on same lever!). You might observe the placement is quite different in modern aircraft.

Keep your nose low
**G. M. Lee CFII**

Good evening team! A great magazine with great people that I know, Paul Loewen and Bob Kromer. Well done with great articles.
**Don Rowling, Canberra Australia**

Excellent issue as always. The thought of a turbo-diesel in my J and getting 185KTAS is better than porn! Only one minor comment from the issue, regarding your review of the Stratus device. It connects to the iPad via WiFi, not Bluetooth.
Keep 'em coming!
**Jeff Schlueter**
**Editor's Note:** Jeff, thanks for the correction. We knew that the Stratus unit connected via WIFI, and even think that is a great design. I guess we just had Bluetooth on our brains.

Great job on the magazine! You must have been a publisher or something in a prior life!
**Austin Kalb**

Phil & Jim,
Great work! (as usual). Thanks for your efforts helping keep the Mooney community informed and engaged! Keep it up!

The Newsletter was, once again, fantastic. I really think you should be more than a volunteer with all the time you have to be spending. WOW!!!
Shery Loewen, LASAR

Your magazine is a most excellent information product!!! You guys are doing the aviation community a huge service with your efforts and talents!!
**Mike Farlow**

Great newsletter. I must say though, that pay now or pay later article scares the crap outta me regarding corrosion. I love the efficiency numbers on those vintage Mooneys, but they sure sound like rust magnets. And apparently that tubular steel is not easy to diagnose either. For those who know Mooneys, is the point the author pushes, concerning not being maintained by a MSC pretty, much a hidden rust coffin really credible? That seemed a little bit of a reach by the author, judging by how some **Mooney** owners I've spoken to seem to have the opposite experience. Still on the fence about these old Mooneys, but great newsletter. Very informative!!
**Hindsight2020**

The Mooney Flyer is excellent! Keep up the great work. Question: On page 13, the "Red Box" at 75% power is 180° ROP to 40° LOP. My 180 HP Mooney C can't be leaned to LOP operation. The recommendation I've always read is 50° to 75° ROP, and what I've been using. So, to get out of the "Red Box" would mean changing to 180°-plus ROP. What would that do to fuel consumption? I've been averaging 9.7 GPH.
**Chet Peterson, N1225X**

**Editors Note: Strictly speaking, if you follow the Red Box, you should be at** 180° ROP. At 50° ROP, your Internal Cylinder Pressure is at the peak, not good for your engine. Some Mooney pilots compromise and fly around 90° to still get a good fuel burn and remain away from peak ICPs.

Great issue of your new magazine - Sign us up whatever the cost!
**Steve Craft and Dick Enright.**

Don't try this takeoff in your Mooney!
Click on the picture to see the takeoff

# *2012 General Aviation Survey*

The survey closes November 30th, 2012. Please make an effort to participate. It should take no more than 10 minutes of your time.

The annual survey is the only source of information on the general aviation fleet, the number of hours flown, and the ways people use general aviation aircraft. The data helps to determine funding for infrastructure and service needs, assess the impact of regulatory changes, and measures aviation safety. The GA Survey is also used to prepare safety statistics and calculate the rate of accidents among general aviation aircraft.

FAA Acting Administrator Michael Huerta says the data gathered with the assistance of owners and operators "helps the entire GA community." Information secured is private for statistical purposes only and will not be published or released in any form which might reveal the identity of the participant.

Aircraft owners and operators who receive a postcard invitation or survey by mail to participate should respond as soon as possible. This can be either by mail or online at AviationSurvey.org, using the aircraft number to log-in.

Let them know about you and your Mooney by completing the survey at http://form.aviationsurvey.org/s/2011/.

**An abbreviated survey form is available for owners of multiple aircraft. Owners of three or more aircraft who receive multiple survey forms are asked to telephone the FAA toll-free at 888-672-4493 or contact the agency by e-mail at infoaviation@aviationsurvey.org.**

Back to Table of Contents

# One of the Best – Developing the M20K 252

Bob Kromer
Former Executive VP and General Manager, Mooney Aircraft Corporation
former Mooney Engineering Test Pilot 1983-1986

In 1985, I was busy flying various research programs as Mooney's factory engineering test pilot. We had just finished the 1984 model changes to the M20K 231, which primarily consisted of converting its powerplant from the original Continental TSIO-360-GB to an upgraded TSIO-360-LB version of the engine. This –LB version incorporated a larger diameter throttle body, allowing the engine to "breathe easier" by allowing a greater volume of induction air into the intake and cylinders for combustion. It was a nice improvement, with cylinder head temperatures reduced by an average of 10-15 degrees F. The engine also idled smoother than the –GB, which tended to surge and stumble somewhat at idle power without aggressive mixture control leaning. The –LB engine upgrade for the 1984 M20K 231 was good enough that Continental began incorporating the larger diameter throttle body on all engines returned to the factory for overhaul or remanufacture. Over the years, this resulted in virtually the entire population of -GB engines to be converted to the -LB configuration.

Flush with this success, we knew we could do even more with the TSIO-360 engine. We put our heads together with the engineers at Continental and looked at all the flight test data derived from developing the –LB engine. From that analysis was born one of the best versions of the TSIO-360 engine series ever built, the TSIO-360-MB. It was this engine, the Continental TSIO-360-MB, that served as the heart and soul of what should be described as one of the best Mooneys ever built, the M20K 252.

Primary powerplant upgrades that resulted in the wonderful engine/airframe combination that became M20K 252 were 1) the incorporation of a NACA inlet on the RH side of the cowling for engine induction air, 2) an engine induction air intercooler that decreased induction air temperatures downstream of the turbocharger and just prior to entering the engine by an average 100 degrees F, 3) a variable wastegate controller that allowed for full throttle takeoffs and climbs, and 4) a larger Airesearch TA06 turbocharger that reduced turbo speeds and temperatures, especially at high altitude.

I made the first flight in early 1985 on the M20K 252 engineering prototype and immediately knew we had a winner. All of the shortcomings of the previous -GB and –LB versions of the TSIO-360 engine were eliminated with the new -MB engine. It ran cool and smooth in all phases of flight. The intercooler showed a reduction in induction air temperatures by at least 100 degrees F in climb and cruise. This, combined with the larger turbocharger, allowed us to certify the engine for 210HP at 36 inches of manifold pressure, compared to the same 210 HP in the M20K 231 at 41 inches of MP. This 5 inch reduction in MP for the same horsepower was huge. Internal engine pressures were less, operating temperatures and turbocharger speeds were also drastically reduced. We also investigated and

changed idle fuel pressures and flows, allowing for very smooth engine idle both in flight and during taxi. On the top end, we were able to reduce fuel flows at takeoff power. Extra fuel flow at high power was needed in the 231 for engine cooling during climb at Vy, but not so in the 252.

The airframe changes incorporated in the 252 were just as important as the -MB engine. The NACA inlet on the RH side of the cowl for engine induction air proved to be a winner. By its design it was non-icing, eliminating an issue we discovered with the original 231 when flown in ice particles or frozen precipitation (my flights in known icing conditions in northern Canada with an instrumented 231 is another story). We increased the size and ramping on the two openings in the front of the cowling for better intake of engine cooling air. This allowed us to cool the engine with "low cost" inlet airflow instead of "high cost" fuel flow at higher power settings.

We incorporated an electrically actuated, low drag, multi-position cowl flap in the 252, eliminating the old push-pull control and high drag cowl flaps used on the original 231. This gave 252 pilots infinite positions for cowl flap settings in climb and cruise – the 231 pilot only had a choice between full open, trail and full closed. We incorporated optional dual alternators and standard dual vacuum pumps for IFR safety and redundancy in the 252 compared to the 231. And we put in wingtip recognition lights for added visibility in high traffic environments. Finally, I wrote a Pilots Operating Handbook (POH) intended to simplify engine and airframe management considerably.

The Mooney dealers and customers loved the M20K 252. I still remember the excitement when briefing the Dealers in Kerrville in late 1985 on the upcoming 1986 model 252. They knew we had addressed all the shortcomings of the 231 and the order book swelled. Those were some of the best days at Mooney and some of the most satisfying of my career. I flew with the major magazine writers (FLYING, AOPA Pilot, Plane & Pilot) and they wrote glowing reports about the 252. FLYING made a side-by-side trip with the 252 flown against the P210. We were proud in Kerrville when the results showed the 252 came out the better airplane of the two. Our little 210 horsepower speedster went head-to-head with the 310 horsepower P210 and did very well.

**252 Flying Tips for Today's Owners**

From the original flight test program, there are many hints and tips that can be gleaned for today's 252 owners. For example, try climbing the 252 at 36 inches MP, 2700 RPM, mixture set to 150 degrees rich of peak TIT (about 22GPH), cowl flaps set at ½ open and 120 KIAS enroute climb speed (110KIAS if heavy or high/hot). This gives excellent enroute climb performance, puts the Mooney wing at its best angle of attack and speed for enroute climb, keeps the engine cool and smooth and places the propeller in conditions for maximum climb thrust efficiency. For cruise, we developed (tuned) the engine induction system, turbocharger, exhaust and propeller combinations for peak efficiency at 28 inches MP, 2500-2400 RPM, Peak TIT plus 50 degrees rich, cowl flaps closed. Expect fuel flows here of about 12.8 GPH (our testing was done before the days of lean of peak (LOP) operations, so I cannot comment on mixture settings on the lean side of peak TIT). Enroute descent is best accomplished at 20 inches MP, 2200-2300RPM, mixture leaned to peak TIT, cowl flaps closed, speed as desired, speed brakes as necessary. Try to avoid any throttle setting below 15 inches MP in descent until in the traffic pattern. We found below 15 inches MP the propeller will "drive" the engine in descent and could shock cool it. Once on the ground, cowl flaps open and it's okay to aggressively lean the mixture on the ground for smooth idle if necessary. And there is no need to idle the engine for a certain period after landing to cool the turbocharger in the 252. That's a carryover from the 231 (and an unnecessary procedure in that airplane) that is likewise not necessary in the 252.

Mooney has built many wonderful airplanes over the years. But I am proud of our engineering team's efforts with the M20K 252. Sometimes you can overpower an airframe, getting small improvements in speed and climb but with big hits in fuel flows, weight and efficiency. The 252 seems to hit the sweet spot for all three of these – a perfect marriage of powerplant and airframe. The flight test program was one of the most successful in Mooney's history and the resulting model 252 remains a lasting favorite. Of all the Mooney's I have flight tested and flown, it is my favorite because it is a technically correct airplane. It's also a favorite when paying the fuel and maintenance bills.

AOPA AVIATION SUMMIT
PALM SPRINGS, CALIFORNIA OCTOBER 11-13

by Phil Corman

We had the opportunity to attend the AOPA Summit in Palm Springs again this year. To avoid the KPSP traffic, we decided to land at KTRM (Thermal, aka Jacqueline Cochrane) about 25 miles southeast. We used Thermal Aviation. They provided fuel at $5.67/gal as opposed to $7.20 at KPSP (which included a $.75/gal discount… geez). Dan, who runs Thermal Aviation, treats you like a million dollars. No traffic problems arriving or departing.

If you get there a day early, you can see the parade of planes. We saw this the first time AOPA did this and expected the planes to be towed. Nope. They taxi down the streets of Palm Springs from the airport to the convention center. It's just fun. We saw everything from a Mustang jet to a Kitfox, a turbine powered Bonanza to a WWII F4U Corsair.

The keynote on Friday was interesting with Harrison Ford.. *Flying* magazine Editor Robert Goyer, AOPA Pilot Editor Tom Haines, and Craig Fuller discussed GA issues. Ford's remarks came at the conclusion of a keynote that included remarks from FAA Acting Administrator Michael Huerta, along with Haines and Goyer. A passionate advocate for general aviation, Ford has offered his celebrity to efforts to educate the public about the value of GA to the nation. Fuller credited Ford with drawing attention to the cause in the halls of Congress; many members of Congress are now members of the GA Caucus, a group Ford said is an effective tool. Ford is a tremendous advocate for general aviation. He flies everything from taildraggers to helicopters. He told attendees that flying helped to reinvent his life.

The Exhibit Hall was full of vendors and attendees for the 3 days. There was not a lot of new stuff, per se, but there were a lot of ADS-B In devices that foretold the future. Many of them had WAAS GPS and AHRS included. For the iPad, the choices still seem limited to Stratus for ForeFlight and Garmin's GDL-39 for their Garmin Pilot app.

We attended a number of the seminars including Basic iPad for Pilots, Advanced iPad for Pilots, Mountain Flying by Pilot Getaways editor John Kounis, Life after 100LL, and the always entertaining Rod Machado. His best line, during a seminar on Inflight Emergencies, was "If you touch anything and something bad happens, UNTOUCH IT!


There were all kinds of evening entertainment. We chose the free ones including VillageFest in downtown Palm Springs on Thursday evening. We had our own, impromptu Mooney pilot dinner at LuLu's, and then walked the main drag which was full of arts & crafts, food, drink, and music. The next morning, apparently I was still having some side-effects when this picture was taken at the Summit.

As always, I think one of the best parts of AOPA Summit is not only the seminars and the exhibits, but also the time to catch up with lots of interesting friends and aviation luminaries. You bump into the coolest people at the Summit, and they always seem to have time to stop and talk. Going every other year, when it is on the west coast, seems like the right frequency to attend the Summit. Stuff just doesn't change fast enough to fly back east. Next year it'll be in Fort Worth, TX. So for us Mooney drivers, it's not too far from most anywhere in the continental USA. The only drawback is you'll have to put up with Texans!!! (only kidding).

I'll leave you with this. What happens at AOPA Summit, stays at AOPA Summit!

**Keep an Eye on that Weight & Balance**


Send your questions for Tom to TheMooneyFlyer@gmail.com

## What is the correct method to break-in a new engine?

This can really open up a lot of opinions but forget all the theories.

Many years ago I made the mistake of letting an owner break-in his own engine. After about 100 hrs I had to remove all the cylinders to remove the glazing and re-ring the pistons. He stopped at a close by airport to pick up his girlfriend and then went on to the break-in flight.

Since that time, if we change an engine, we break it in or I won't do the engine change. If I am going to be held responsible then I will do the break-in. I believe that the people who built the engine know how to break it in so I use: **TCM SB 89-7**, "Engine ops after cylinder or overhaul instructions" or **Lycoming SI 1427B,** "Operation after overhaul and cylinder change".

I also require my pilots to do the break-in over the airport so they are in gliding distance in case of a problem. (That's another story)

Both procedures are very much alike but we use the one that applies. Since I have followed this guidance, we have never had any problems due to a poor break-in. The rings are almost completely seated and usually we go to detergent oil after about 20 hours. We break in certain engines with detergent oil.

## Why do Continentals seem to need top overhauls before TBO?

This is not easy since you have to assume the question is correct. I believe the Lycoming cylinders are built heavier and withstand the heat changes better than the TCM engines. The TCMs that require the tops early are mostly the turbocharged versions that really run high temps and are very critical on how they are operated. The aspirated versions seem to be reliable. We deal mostly with the IO- 550s which I feel is one of the best engines today.

## What issues do we see at Annuals or repair that are pilot caused?

That's easy, almost everything. Mooney pilots, as a group, are pretty good at not abusing their airplanes, especially versus the "Clorox bottle" pilots (Cirrus and plastic planes). If I had to pick a few things, flat-spotted tires would be #1. Too much oil in the engines makes for messy gear doors. We have changed a few tail skids, but the Mooney is a strong built plane that can take a beating well. I have two customers that had midair collisions and landed safely. One aircraft had the rudder torn off and the vertical laid flat, while the other had about six feet of a wing torn off. Both landed easily. I could probably make a case about how some operate engines but that subject is well covered on the chat page.

One suggestion: Quit trying to make the first turnoff on landing and you will save a lot on tires and brakes.


# So You Want to Buy a Mooney!

## Here's What You Want to Know

## Part 1: The Short Body Mooneys (M20A-M20E)

There are a large number of our readers who do not yet own a Mooney. We thought it might be useful to provide an overview of the M20 family to assist potential owners in finding the right Mooney for their mission. The M20 family can be placed into 3 general categories; 1) Short Body, 2) Medium Body, and 3) Long Body. In addition to differences in leg room and baggage space, there are different handling characteristics of each class, which we'll delve into later in this article. The cabin size appears small and cramped to non-Mooney owners. This is mostly an optical illusion, as the cabin is essentially the same size as a Bonanza.

All Mooneys have several things in common, such as load limitations of +3.8g to -1.5g. All Mooneys have, essentially, the same **laminar flow wing.** This wing is thin compared to your garden variety Cessna or Pipers. Laminar flow is an essential design component of why Mooneys are faster and more economical to fly. The flush riveted laminar flow Mooney wing is also a unique design in that it is very strong, one-piece and has a single spar from wingtip to wingtip. The fuselage can be removed and the wing rolled around on the wheels. The flaps stretch out over nearly two-thirds of the wing, while the ailerons are short and wide and run right to the tip of the wing — a combination designed to give better control at slow speeds.

Attached to the wing is an equally strong fuselage. Rather than being the typical monocoque construction, Mooneys feature a **welded steel tubular frame** wrapped with non-structural aluminum as the foundation for the forward fuselage.

Another design feature of all Mooneys is the **moly steel space frame** around the cockpit which provides a significantly improved passenger survivability factor.

Most single engine general aviation aircraft utilize cables and pulleys for flight controls. Mooneys utilize **metal rods** which facilitate a much more positive (and slack-less) responsiveness to airleron, elevator, and rudder control.

The tailplane design is unique to Mooney, as most pilots refer to it as being placed backwards. The theory is that the tail design positions the rudder directly in-line with the airflow when at slow speeds and high nose attitudes. This makes the rudder more effective just when you really need it, such as when landing or approaching a stall. Probably a lesser known fact is that the Mooney pitch trim control moves the entire empennage rather than using drag inducing trim tabs. The later Mooney M20 designs eliminated the recognizable tail geometry.

Now that we have done a brief overview of what is common across the Mooney M20 family, we'll start a discussion of the variations in models.

**The Short Body Mooneys (M20A thru M20E)**

The short body M20's have a fuselage length of 21' 3" and a wingspan of 35' 3". Most short body Mooneys have the famous Johnson Bar. The Johnson Bar is used to manually retract and extend the

gear. This is a joy of flying the early short bodies and eliminates a lot of failure points from electrical gear. Electrical gear operation was introduced in 1969. If your arm is working in a J-Bar Mooney, so is your gear. Another feature of these short bodies is the hydraulic operation of the flaps. You simply pump the flaps to set them from 0-full flaps.

Until 1977, standard Mooney equipment included an automatic wing leveller known as the Positive Control or PC system. Pneumatically operated, the PC system senses both roll and yaw in the turn coordinator, which meters vacuum to cylinders attached to the control tubes. Slowing the slippery Mooney down requires forward planning.

**M20A**: The first M20 and M20A are distinguished by having a wood wing. Almost 700 wood wings were produced by Mooney. All other M20 models are metal. These models may have Lycoming 150 hp O-320 or 180 hp O-360-A1A. Empty weight on the M20A is typically 1470 lbs and Gross Weight is 2450 lbs. Fuel capacity in the M20A is 35 gals. Dirty, the M20A will stall at around 50 mph. Some Mooney pilots believe that the wood wings provide a smoother ride in turbulence. Bill Wheat thought "For equal horsepower, the wood wing airplanes were faster than the metal ones. The M20B was 5-8 mph slower than the M20A". At a fly-in at Page, AZ, Dave Morris' M20A out flew an M20J over Lake Powell.

**M20B**: This model sports an Empty Weight of 1525 lbs and a Gross Weight of 2450 lbs. It was marginally faster than the M20A and only shipped with the 180 hp Lycoming.


**M20C**: The Mark 21 has the same 180 hp engine (Lycoming O-360-A1D). This engine is one of the best in all of general aviation and its track record is impeccable. The O-360 is a foolproof engine to start. Once running, a good M20C pilot is immediately on the mixture control, leaning it out for smooth engine operation on the ground. Carburetors are notorious for uneven fuel distribution to the cylinders and overly rich mixtures at low power settings. A Mooney pilot who takes the time to aggressively lean the mixture for ground operations will have a smoother running engine and spark plugs that will last a long time. But while taxiing, you'll notice a characteristic that is inherent to the Mooney landing gear design: Mooneys ride on stiff gears. Our landing gears are a marvel of simplicity and low maintenance, but the price we pay for this simplicity is a stiff ride. For some reason, the airplane requires a pretty healthy pull to come unstuck from the runway, but that same pull is too much once the airplane is airborne. The result is a pitch up immediately after liftoff that requires a relaxation of some of the pull force required to rotate the airplane. On climb out, use full throttle, max rated RPM and the mixture leaned to 100-125 degrees rich of peak. If you want to climb your C model efficiently, that's the power you'll consider using. At cruise, you can expect 142 kts in the C at around 8000'. The C has an Empty Weight of 1525 lbs and a Gross Weight of 2575 lbs. It cruises at about the same speeds as the M20B. From 1974-1976, the M20C

Ranger was shipped. The Ranger has essentially the same specs as the Mark 21. In the interest of speed, the entrance step retracted during flight. A one-piece windshield was introduced in 1968. Other compromises with the C model are: 1) the ridiculously low top of the green arc on the airspeed indicator, which makes it almost impossible to make efficient, high speed descents from altitude, 2) a cowling design that makes it impossible to look at the engine on a regular basis for good pre-flights and has poor aerodynamics, 3) a carburetor that makes ice, an issue if you fly a lot of IFR and 4) an instrument panel that was designed when good pilot ergonomics were unheard of. Later Cs converted to the T design and electric gear and flaps. I have to tell you, the manual gear is a tough one to call. Some pilots will like its simplicity. Other pilots will think it is archaic and outdated. But it's not hard to operate if you retract at the lower airspeeds. And ensure that it's locked when extending the gear down.

**M20D**: In 1963 Mooney introduced the M20D Master. The 20D is basically an M20C with fixed gear. The

M20D was type certified on 15 October 1962. This airplane left the factory on January 31, 1963. Mooney is known for it's retractable-gear aircraft so the idea that Mooney manufactured fixed-gear aircraft is new to most aviation buffs. The aircraft was intended primarily for flight training and for owners seeking lower insurance rates. The last M20D Master was produced in 1965. All but three have either been converted to retractable-gear for increased cruise speed and climb performance, or they are no longer in existence. The other fixed-gear Mooneys still around are N1916Y located in Princeton, New Jersey and N6651U in Edgewood, MD. The Empty Weight is 1455 lbs and Gross Weight is 2500 lbs. The cruise speeds are significantly below all other short body models (approx. 125 mph) and a much lower ceiling of about 13,500 MSL.

**M20E:** This is the first truly high performance Mooney. Firewall aft, this is the same airplane as the

M20C. It typically cruised 10 kts faster than M20C models. There were three (3) distinct M20E models; 1) the Chaparral (pre 1974), 2) Chaparral (post 1974) and 3) the Super 21 Chaparral. Think of the M20E as an M20C with 200 hp, Bendix fuel injected (IO-360). The M2OC with its carbureted 0-360-AID is a delight to start hot or cold. A few pumps on the throttle and the engine fires right away. The choice of the fuel injected IO-360-AIA in the M2OE eliminates the carb ice issue, but adds the compromise of hot starts that have to be finessed like playing a piano. So you make your choice - M2OC (carburetor) or M20E (fuel injection). Learn how to handle the carburetor ice threat with an M2OC or how to hot start the M20E--the choice is yours. On takeoffs, there is no other Mooney that can touch the takeoff distances of an E, even the new ones. Certainly, the newer models have much more horsepower, but they are also a lot heavier. If you fly often from short runways, the E model is the best of the best Mooneys for short field operations. Positive rate of climb established after takeoff and all the engine parameters in the green, it's time for a manual gear retraction. When compared to the C, the extra 20 horsepower of the E model buys an extra 140 FPM at 100 mph and an additional 117 FPM at 120 mph. It has an Empty Weight of 1600 lbs and a Gross Weight of 2575 lbs, and a ceiling of almost 19,000'. The Super Chaparral cruised approximately 3 mph faster than earlier models, but with Ram Air on (bypassing the air filter), it can be 10 mph faster. The M20E is essentially a 150 kt airplane. Electric gear was introduced in 1970. The best mod to speed her up even more: The cowling.

We'll cover the Medium and Long Body Mooneys in future editions of The Mooney Flyer.

**The Medium Body Mooneys (M20F thru M20K)**

The medium body M20's have a fuselage length of 24' 8" and a wingspan of 36' 1".

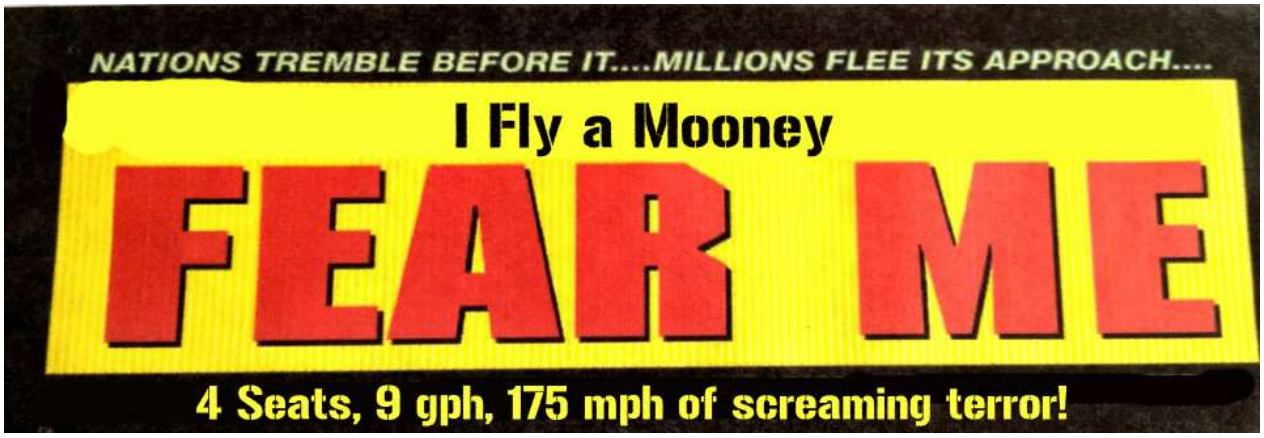
**The Long Body Mooneys (M20L thru M20TN)**

The long body M20's have a fuselage length of 26' 9" and a wingspan of 36' 1".

### Some Useful Links

Mooney Performance Specs: www.pilotfriend.com/aircraft performance/Mooney/31.htm

Mooney Model Chronology: www.mooneyevents.com/chrono.htm




**Did you switch tanks like I asked?**



# Get Home Itus and the Flight From Hell

(Anonymous) Edited by Jim Price

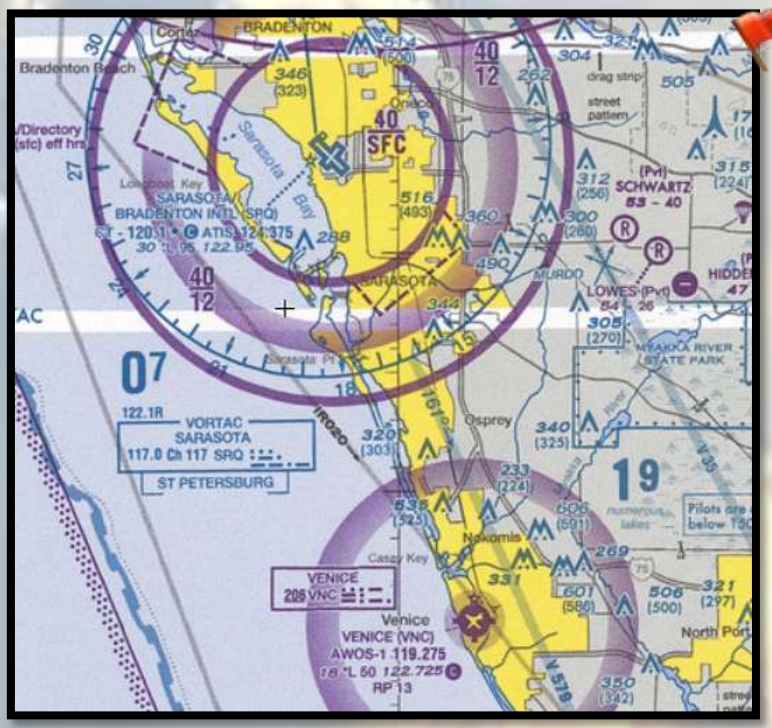
*"A good traveler has no fixed plans and is not intent upon arriving." - Tao Te Ching*

I fly in Florida and, at the time, I might have had about 200 hours total – just enough to feel slightly invincible. I was flying an old school Skyhawk with a STOL kit that I had come to love. I can park that plane anywhere. On board were myself and my girlfriend. We had flown down to Venice (KVNC) for some sun and surf. The beach and a great restaurant are a short walk from the airport.

**Red Flag #1:** We'd finished dinner and were on our way back to the airfield. It was very dark and I had noticed some off shore lightning, but didn't think much of it. However the lightning north and east of the field did get my attention.

**Red Flag #2:** I turned the GPS on and sure enough, there are three cells forming up a nice horse shoe around central Florida but wide enough that we might make it back before they could roll over the airport. My instincts are screaming at me, DO NOT FLY THIS OUT! My girlfriend, on the other hand, was extremely concerned about getting home as she had to work in the morning. She had started a new job and was ultra concerned about making the right impressions.

**Red Flag #3:** I gave in and we jumped in the Skyhawk. Right off the bat I knew this was a bad idea. We took off downwind (only four knots by the AWOS) to avoid flying over the black hole of the Gulf of Mexico and to avoid the storm already closing in from that direction.




**Red Flag #4:** I was on the horn with Tampa ATC and immediately noticed the surprise in the controller's voice that anyone would even be out in those conditions. That should have been a clue. I was getting vectors north around the cells and thought that everything was relatively cool, although I could see lightning flashes in all four directions. Ok, the situation was getting my attention but, I was not sweating yet.

**Red Flag #5:** ATC told me to turn to 090° to clear the way for a Mooney on a long 15 mile straight in final to Sarasota (KSRQ). Here was another invincible soul who thought he could sniff his way through the Cumulonimbus clouds that night.

### *Alarm Bells*

This is when the alarm bells started a faint whisper in my ear. Here's another aircraft getting a 15 mile final straight into an airport, 15 miles out. I suppose it crossed my mind that if he couldn't make a turn, or set up for a local pattern or approach then something must have been very wrong with the weather.

ATC told me that the nearest cell to me was 20 miles away and that he would get me back on course before I we flew too close to it. I was about to learn a very important lesson about what ATC can and can't see on their radar scopes.

Radar can only reflect falling precipitation. It can't do anything for you as far as clouds are concerned and the sweeps are a bit delayed from reality. So what seems like a wide open hole in the sky could actually be filled with all kinds of nasty weather.

### *The Killer Turn*

I turned to 090°, blindly accepting that ATC had the world completely under control. I was at 2,500 feet MSL and had just rolled level when the world outside the window went completely black. I had just flown into a cloud wall. I told Tampa what was going on and rolled back into a left turn, intending to "180" out of there, glued to the instruments. Tampa was actually a lot more concerned and started rapid firing instructions to do exactly what I had already done. The outside world was starting to deteriorate rapidly and the plane was bouncing and rolling uncontrollably.

Just as I broke out in a 30° plus bank turn, the Skyhawk was hit full broadside by an enormous wind. The bottom suddenly fell out from under the plane. My girlfriend had a death grip on the sides of her chair and the only part of the world I could recognize were the instruments in front of me. The most alarming instrument was the vertical speed indicator, showing a 2,000 per minute descent correlated by an altimeter which was spinning rapidly. Things had gone very, very south.

Although the plane was buffeting, I finally leveled off around 1,000 feet, wings level and somehow under **Va** speed. I had just lost 1,500 feet of precious altitude in the span of a few seconds. I had a white knuckle grip on the yoke and a laser focus on the panel in front of me. The rest of the planet as far as I was concerned did not exist. Calm as a coma, I keyed the mike and asked Tampa for a straight-in to Sarasota. I was completely done with our flight and wanted nothing more than to be on the ground. I made the smoothest landing I've ever performed in my flying career; not realizing that we had landed. After I taxied and shut down, I finally looked at my girlfriend in the right seat. She was completely pale, and was still white knuckling the chair in both hands. She simply muttered, "Nice landing".

We managed to get home later that night, after waiting two solid hours for the surrounding convection to burn off. Lessons learned were stark and profound:

- Never let the urge to complete the mission compromise the flight.
- Never fly into a box canyon that's formed by surrounding weather.
- Never put complete faith in ATC. They're just as human as the pilots they direct.

I later required surgery to remove the seat cushion from my overly puckered posterior.

Back to Table of Cont


## A Mooney Tale – Santa Fe, New Mexico

by Linda Corman, cool co-pilot & Mooney navigator

We were sitting around the house thinking that we had not flown in a few months. Where should we go on our next trip?

I was just looking through a Sunset magazine when I found a story about Santa Fe, New Mexico. That looked like fun. It was February so the weather was cool there, but we thought what the heck. It will be pretty with a little snow on the ground. Phil started planning and a few days later we headed out for New Mexico.

After we landed and picked up our rental car, we headed for town. We stayed in a little inn just out of town with "Kiva" fireplaces in every room. Very Southwest. With only a few days in Santa Fe we headed to downtown the first day to look over the shops and restaurants available. I did not realize that Santa Fe is a major city. The shopping is wonderful as was every restaurant we went into. However, if you like galleries, they are on every street corner. We fell in love with a few of the local artists and ended up taking home some beautiful prints. The sights in downtown Santa Fe are not to be missed. There is a large cathedral in the center of town and the governor's plaza. These are must see sites. The local people set up blankets in the plaza where they sell beautiful southwest jewelry. Additionally, we walked over to the Loretto Chapel. They have a staircase there that spirals two 360° turns without any obvious measure of support. The chapel is beautiful and the stairs are a wonder.

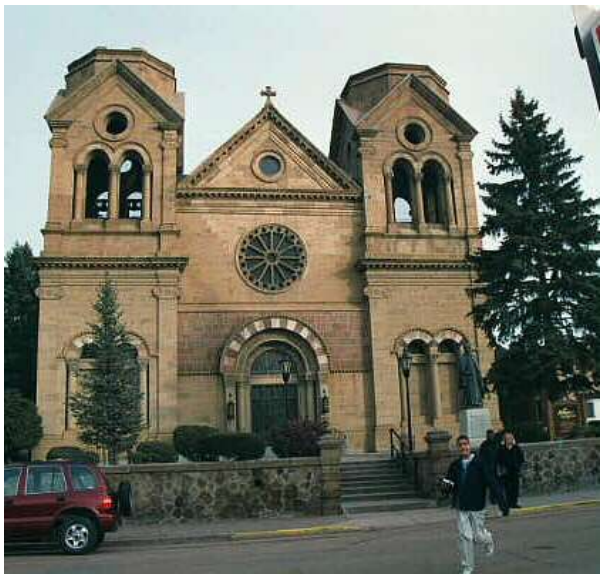
After walking around town all day it was time for dinner. We found a restaurant located on the second floor, called the "Blue Coyote", where we could sit at the bar and watch

Back to Table of Contents

the chefs prepare the food. Very fun, as the chef finished a dish he would pass some of it for us to try.

Next day, we were off to Bandelier National Monument and Frijoles Canyon area. Bandelier is amazing. You can climb around the cliff dwellings and into some of the rooms that still exist in the walls. We spent a lot of time enjoying the site. There is so much to see there. We also took a short hike to a covered ceremonial Kiva. It has been fully restored so that you can climb down into it.

On the next day, we decided to take a trip to Taos, a ski area and artsy town north of Santa Fe. The town of Taos is charming with loads of galleries and shops. The outside statuary is outstanding. We took the scenic route instead of the interstate, which is always more fun. We walked the town, shopped, visited the Kit Carson museum, and then had lunch. The highlight at the restaurant started when the waitresses thought Phil was some kind of celebrity. Of course, when he denied it, the myth with the wait staff became stronger. Finally, Phil played along by not denying it any longer. After lunch, the waitress asked him to sing a song. For reasons unknown to me, he chose to sing "If I only had a Brain" from the *Wizard of Oz*. It was memorable. Mooney pilots continually amaze! We then decided to drive through Los Alamos Canyon and pass through the Jemez Caldera to make a circle back to Santa Fe. It is beautiful country especially with snow on the ground.



Along the way, we stopped at Los Alamos, the home of the atomic bomb. It was very interesting and also very sobering to see the Big Boy.

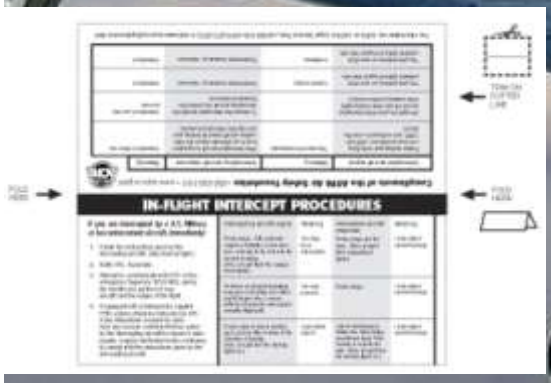
There is so much to see and do in the Santa Fe area, we just ran out of time to enjoy it all. We will have to go back, and soon.

Over and out, from the right seat of our Mooney!

# Navigating VIP TFRs

By Jim Price

**Should you choose to skip this article, you should at least click HERE for an IN-FLIGHT INTERCEPT PROCEDURES Card. You can print it and keep it in your wallet for quick reference.**




**When the F-16s come for you, you won't be able to see the pilots' fingers on the triggers and you'll be clueless about what's up. However this little card will tell you exactly how to cooperate.**

## *It happens too Often*

One morning, a Mooney pilot friend of mine, got to his Los Angeles area airport early for a flight to Chino for breakfast with friends. He was aware that a VIP TFR was active. He would remain clear of the 10 nm ring. Although his airport has a tower, he was taxiing 10 minutes before it became operational, so he announced his departure on CTAF. The flight to Chino can be made under all of the Los Angeles Class B, so he didn't talk to anyone until approaching Chino. When he landed, the Chino Police Department met him at his airplane and informed him that he had violated the TFR. They were very friendly, and quickly realized that he was NOT a threat, recognizing an honest mistake. They asked him to remain at the airport as the Secret Service were enroute to talk with him. He went into the restaurant on the field and had breakfast with his friends. The Chino PD waited patiently on the ramp. Some time after breakfast, the Secret Service arrived. He had a similar exchange with the Secret Service, who also recognized the incident as an accident. Both the Chino PD and the Secret Service were professional. The Secret Service even apologized for taking so long to get to Chino, due to LA traffic. He was allowed to fly his Mooney home without incident.

## *So What Happened?*

He did not violate the 10nm ring, but unfortunately, he flew VFR within the 30nm ring. It was an honest mistake. Nevertheless, he lost his pilot privileges for 120 days. The following will help you avoid sanctions and Mooney separation.

There are two basic types of VIP TFRs:

The ***Big*** one: 10/30nm VIP TFRs, reserved for use in association with **Presidential** movement,

1. 3nm VIP TFRs, used for **Vice Presidential movement or movement by other lower-ranking government officials.**

## *Big Secret*

These TFRs are governed by FAR 91.141 and are generally kept a secret until two or three days before the event.

## *Structure – President of the United States & VP*

VIP TFRs are normally set up as **one or more rings** of airspace, surrounding the VIP, which become active for a specific amount of time. The normal arrangement is to have one ring covering the VIP's arrival and departure location(s) **and another covering the area where the VIP will be between arrival and departure.** While these rings are stationary, there are occasions where **"rolling" TFRs** are created to accommodate a moving event (such as one on a train or bus).

## *10/30nm VIP TFRs (Presidential)*

If you see one or more 10 mm rings surrounded by one or more 30 NM rings, avoid these at all cost, with a few exceptions. (See "IFR GA Flights Inside the 30nm Ring", next page for exceptions). The shape and dimensions of the rings may vary.

## *Inside the 10nm Ring*

Because general aviation aircraft are not screened by the TSA, they NOT allowed inside the **inner,** small ring(s) below 18,000 MSL. Airports within these areas are unavailable to GA aircraft during the specified times.

Call a Flight Service Briefer and check TFRs. This puts your conversation on tape. You can also do the "Gee, I don't have any proof that I checked" method at http://tfr.faa.gov/.

## *Cutouts*

A TFR might be structured with a "cut-out" to allow operations into an airport that lies just inside the inner ring. This happens quite often for Teterboro Airport (KTEB) when TFRs are placed over the New York City area. However, certain approaches and departures may not be available from the airport in the cut-out.

## *IFR GA ONLY 30nm to 10nm*

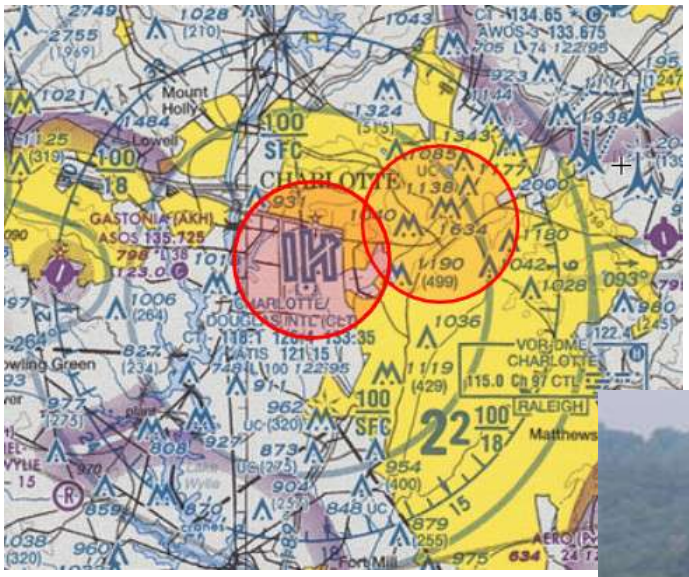
**GA aircraft flights are permitted inside the 30nm ring but outside the 10nm ring, as long as they are on IFR flight plans and in communication with air traffic control.**

However, in this airspace, you cannot do the following:

- Loiter
- Flight training
- Practice approaches
- Sightseeing flights

## *3nm VIP TFRs (Vice President and below)*

These consist of one or more 3nm rings and no outer rings. These TFRs are less restrictive for GA aircraft, allowing aircraft that are on **IFR flight plans and in communication with ATC.**




You can also check for TFRs and valid times at http://tfr.faa.gov/

## *Halting Operations*

When an airport is contained within a 3nm-type TFR, airport operations are typically halted for a short period of time while the VIP is at the airport or is departing or arriving. As a result, operators flying into an airport sitting under a 3nm ring can expect minor delays during the TFR's active times.

Call a Flight Service Briefer and check TFRs.

JIM PRICE ATP, CFI-I, MEI

# The Flight Review

***Your Flight Review Certified Flight Instructor (CFI)*** must be qualified in your **airplane's Category and Class.**
In case you've forgotten, here's a quick review of Category and Class:


The Mooney, of course, is an Airplane, SEL – so your CFI must have currency in an airplane SEL – that's it. He or she doesn't need to have five hours of PIC flight time in your model of Mooney, or in any Mooney.
That being said, you may want to seek out a CFI with Mooney experience, or take advantage of the Mooney Pilot Proficiency Programs (MPPP) sponsored by the Mooney Safety Foundation. The Mooney PPP instructors have experience in your model. The last Mooney PPP program for 2012 will be held in Olathe, KS - Oct 12-14 (includes a tour of Garmin)
You can learn more at ***http://www.mapasafety.com***

Your CFI doesn't need a current FAA Medical if you can be the Pilot In Command (PIC). You can be the PIC if you have an unexpired flight review and have a current medical.

## *What to Expect from the Oral and the Flight*

*The flight review does not involve a written examination. It requires a minimum of:*

- A one hour oral, including a review of flight rules found in FAR Part 91.
- A one hour flight.

If you are a "15 – 20 hours per year pilot", or you haven't flown for a long time, expect a longer oral and flight.


## *The Oral*

To prepare for the oral, you can study a current FAR/AIM, Sectional and your POH.
Or you can simply read the "Flight Review Study Guide", available at **http://www.JDPriceCFI.com** . You would be wise to also review your POH.

In addition, you might consider completing the "*Flight Review Prep Guide*" course available at **http://www.faasafety.gov** . Bring a copy of the completion certificate to the flight review.

Your CFI may give you a short (no more than 50 nm) cross-country flight plan assignment to an unfamiliar airport. Be sure to consider runway lengths, weather, fuel requirements, terrain, NOTAMs, TRFs, etc. Your CFI could require a manual flight plan, or allow you to prepare using an online planner.

## *The Flight*

Your CFI could ask questions to determine your experience and the type of flying that you normally do, and then determine which maneuvers you'll perform. Remember that it's proficiency-based, and the CFI has discretion on how much time and how much instruction is needed to ensure that you are proficient. You must demonstrate that you can safely exercise the privileges of your certificate.

As you fly selected maneuvers, you'll be evaluated on your basic stick and rudder proficiency. If asked to fly a short cross-country, that's a good place to sample your knowledge of aircraft systems, and your ability to make good decisions when faced with unusual circumstances, (*Aeronautical Decision Making* and *Risk Management*). For instance, you may be asked to consider a mechanical problem or an unexpected weather scenario, which will require a diversion to another airfield.
Use all your tools and resources, including the "Nearest" and "Direct to" functions on your GPS. For more information, see **http://www.aopa.org/asf/publications/sa03.pdf**

## *Logging Flight Time*

You don't need a current medical to have an annual review, but if your medical has expired, you'll log the Flight Review time as "dual". Once you get a medical, you can then fly as PIC. If you have a current medical, then log the time as PIC.

## *How Much Should You Train?*

There are flight departments of all sizes, from the largest airline, to the company that has one plane to run errands. No matter the size, they all want their pilots to be proficient and highly trained. Every passenger expects their pilot to be full of knowledge, well trained, proficient, and competent.


*Is a Flight Review with a CFI every two years working for you? Perhaps that depends on how much you fly, and how much you feel challenged as an aviator. If you feel that you would like more training, please go to* ***http://www.FAASafety.gov*** *and register for the Wings program. This basically requires a short flight with your CFI every four months and completing an approved course every four months. Courses take about an hour. Some are free and some require a course purchase.*


Volume 1 Number 7 November 2012

# *Useful Aeronautical Terms*

**AIRSPEED** - Speed of an airplane. (Deduct 25% when listening to a retired fighter pilot.)

**BANK** - The folks who hold the lien on most pilots' cars.

**CARBURETOR ICING** - A phenomenon reported to the FAA by pilots immediately after they run out of gas.

**CONE OF CONFUSION** - An area about the size of New Jersey located near the final approach fix at an airport.

**DEAD RECKONING** - You reckon correctly, or you are.

**DESTINATION** - Geographical location 30 minutes beyond the pilot's bladder saturation point.

**ENGINE FAILURE** - A condition that occurs when all fuel tanks mysteriously become filled with low-octane air.

**FIREWALL** - Section of the aircraft specifically designed to funnel heat and smoke into the cockpit.

**FLIGHT FOLLOWING** - Formation flying.

**GLIDE DISTANCE** - Half the distance from an airplane to the nearest emergency landing field.

**HYDROPLANE** - An airplane designed to land long on a short and wet runway.

**MINI MAG LITE** - Device designed to support the AA battery industry.

**NANOSECOND** - Time delay between the Low Fuel Warning light and the onset of carburetor icing.

**PARASITIC DRAG** - A pilot who bums a ride and complains about the service.

**ROGER** - Used when you're not sure what else to say.

**SECTIONAL CHART** - Any chart that ends 25 nm short of your destination.

**SERVICE CEILING** - Altitude at which cabin crew can serve drinks.

**SPOILERS** - FAA Inspectors.

**STALL** - Technique used to explain to the bank why your car payment is late.

**STEEP BANKS** - Banks that charge pilots more than 10% interest.

**TURN & BANK INDICATOR** - An instrument largely ignored by pilots.

**USEFUL LOAD** - Volumetric capacity of the aircraft, disregarding weight.

**YANKEE** - Any pilot who has to ask New Orleans tower to, "Say again."

Wanna climb in your Mooney? Pull back on the stick. Wanna descend quickly? Pull back some more!

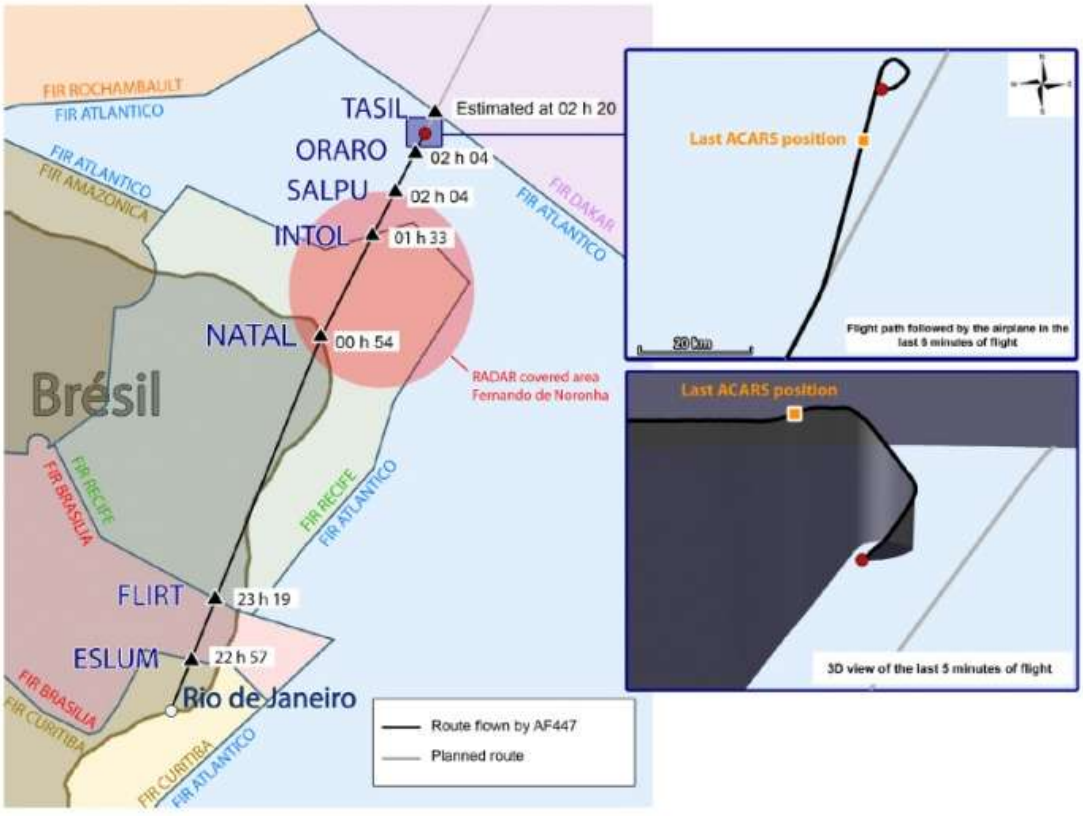
PHIL CORMAN

# Fatal Crash caused by lack of Stick & Rudder Skills?

This story is about an Air France Airbus 330-200 that crashed over the ocean. We are writing about this accident since it seems to us that basic stick & rudder skills were lacking. The pilots failed to identify and rectify a simple instrumentation malfunction, then displayed questionable stick & rudder responses, followed by a lack of proper responses to sensory inputs. Wow… that's a lot of bad Mojo. We have excerpted a portion of the report here, and you can click on a link at the end of the article for the complete report. The events started out with the Airbus flying straight and level, before all airspeed indications became unreliable. Our comments are in the shaded areas.

It was possible to confirm that prior to the onset of the event sequence, level flight at a speed of Mach 0.82 was being maintained with a pitch attitude which was normal for the circumstances of about 2.5°. The aircraft commander (who had been acting as PNF) had then left the flight deck for a planned rest period leaving the two co-pilots in the flight deck with right seat co-pilot continuing to act as PF. Shortly afterwards and in quick succession, two of the three airspeed indications, those on the left hand PFD and those on the ISIS (the Integrated Standby Instrument), failed followed by that on the right hand PFD indication. Recorded data showed that the speed displayed on the left hand PFD was incorrect for a total of 29 seconds, that on ISIS for 54 seconds and that on the right hand PFD for up to a total of 61 seconds. After these short intervals, normal function returned to all three displays. Their transient malfunction was subsequently attributed to ice crystal icing of their respective pitot probes, as had occurred previously in similar environmental conditions to other Airbus A330 aircraft flown by various operators. The reconstructed flight track reproduced from the Official Report.

As the Airbus A330 is a Fly-By-Wire aircraft, a secondary effect of these failures was that the prevailing Control Law changed from 'Normal' to 'Alternate' with the effect of removing Flight Envelope Protection in respect of any attempt to fly at an excessive angle of attack. Crew awareness of such a change is



confirmed by the CVR recording of the PNF acknowledging 'alternate law protections'.

Granted, we do not have such systems in our Mooneys, but the pilots were aware of the system change.

The sudden change to manual flight control was found to have been followed almost immediately by a series of inappropriate pitch control inputs by the PF (we think this means Pilot Flying) and, as a result of these inputs, two brief activations of the stall warning system. In the presence of some roll instability, the pitch attitude of the aircraft had initially increased to beyond 10 degrees and the aircraft began to climb at up to 7000 fpm with no recorded comments from either co-pilot. The PF then made nose down inputs alternately to the right and to the left and the rate of climb reduced to 700 fpm. After an absence of 29 seconds, valid indications returned to the left side PFD showing Mach 0.68. By this time the aircraft was at about 37,500 ft with a recorded (but not annunciated) angle of attack of around 4°. Thirty nine seconds after the AP disconnection, the stall warning was again activated, this time remaining continuously active.

It appears the the PIC kept the nose in an incipient stall continuously.

The response of the PF was to select TO/GA (we think this selection means Takeoff/Go-Around) and maintain nose-up input. The recorded angle of attack continued to increase and the trimmable horizontal stabiliser (THS) moved from 3° nose-up to 13° nose-up in about a minute in response to pilot control inputs and then remained there until the end of the flight. It was determined that *"in less than one minute after the disconnection of the autopilot, the aircraft became fully stalled and exited the AFM Flight Envelope as a result of the actions of the PF"*.

Having reached an altitude of 38000 feet, the aircraft began to descend fully stalled. As the descent continued, and approximately 30 seconds after the fully stalled condition had begun, the aircraft commander re-entered the flight deck. During the following few seconds, all of the recorded airspeed indications became invalid and the stall warning stopped, after having sounded continuously for 54 seconds. The altitude was then about 35,000 ft, the angle of attack exceeded 40 degrees and the vertical speed of the descent was about 10,000 fpm. Pitch attitude did not exceed 15° and engine thrust remained close to 100%. After the aircraft commander had been present for 20 seconds, the thrust levers were reduced to Flight Idle. As the aircraft continued to descend in a fully stalled condition, *"the angle of attack, when it was valid, always remained above 35°"*. All recordings ceased 2 minutes and 46 seconds after the aircraft commander had re-entered the flight deck with pitch attitude recorded as 16.2° nose-up.

It was noted that all activations of the stall warning system had occurred in accordance with their design and that the stalled condition had been characterised by the onset of buffet. It was also noted that at no time had there been any reference to the stall warning or any formal identification of the stalled condition by any of the pilots.

In considering the failure of the co-pilots to respond rationally to the onset of unreliable airspeed and subsequently to perform an appropriate and timely recovery from the self-generated incipient and subsequently active stalled condition, the Investigation noted the following in respect of the training which they had received:

*"The only opportunities available to the two relatively low experience co-pilots to learn about stall were during their basic training, and then as part of one or two simulator sessions during their initial training for A320 type rating. These exercises were conducted at low altitude (FL100) with the focus on*

*demonstrating and analysing the phenomenon, and with particular attention on the operation of the aircraft's protections in normal law. In alternate law, the approach to stall exercise exposes the trainee to the stall warning in a situation in which it is expected, and the corrective actions to be performed are prepared in advance. The exercise lets the trainee experience the onset of the vibrations due to buffet, which confirms the stall phenomenon.*

*At high altitude, the margin between the normal angle of attack in cruise and the angle of attack that activates the stall warning is very small. Trainees who perform the exercise at low altitude note a reduction in speed compared with the reference values but are not sensitized to the proximity of the angle-of-attack threshold at which the warning is triggered.*

*The demonstrative nature of the exercises undertaken does not enable the crew to appreciate the startle effect generated by the stall warning, nor the reflex actions on the controls that may be induced. Current training practices do not fill the gap left by the non-existence of manual flying at high altitude, or the lack of experience on conventional aeroplanes. Furthermore, they limit the pilots' abilities to acquire or maintain basic airmanship skills.*

*More generally, the exercises performed in a simulator follow a predetermined scenario, and even if there are variations from one session to the next, the trainees are more or less familiar with the failures they will have to deal with. In this respect, the training scenarios may significantly differ from the reality of an in-flight failure. The startle effect associated with this operational reality is destabilising and generates stress. It may have a direct impact on the correct execution of a manoeuvre, or on the ability of a crew to diagnose the problem and then recover the situation. However, the conditions in which training is delivered are not conducive to giving instruction in these environmental factors, and thus to the subsequent application in service of the non-technical skills necessary for the correct management of an unexpected situation."*

It was ascertained that the professional flying experience of both co-pilots had been facilitated by cadet training and gained within Air France on Airbus aircraft types. The more experienced of the two overall was the PNF who had been with Air France for 11 years and on type since 2002. The PF had been with Air France for 5 years and had completed A330 type conversion just six months prior to the accident.

The **Causes of the Accident** were documented formally as follows:

*"The obstruction of the pitot probes by ice crystals during cruise was a phenomenon that was known but misunderstood by the aviation community at the time of the accident. From an operational perspective, the total loss of airspeed information that resulted from this was a failure that was classified in the safety model. After initial reactions that depend upon basic airmanship, it was expected that it would be rapidly diagnosed by pilots and managed where necessary by precautionary measures on the pitch attitude and the thrust, as indicated in the associated procedure.*

*The occurrence of the failure in the context of flight in cruise completely surprised the pilots of (the accident flight). The apparent difficulties with aeroplane handling at high altitude in turbulence led to excessive handling inputs in roll and a sharp nose-up input by the PF. The destabilisation that resulted from the climbing flight path and the evolution in the pitch attitude and vertical speed was added to the erroneous airspeed indications and ECAM messages, which did not help with the diagnosis. The crew, progressively becoming de-structured, likely never understood that it was faced with a "simple" loss of three sources of airspeed information.*

*In the minute that followed the autopilot disconnection, the failure of the attempts to understand the situation and the de-structuring of crew cooperation fed on each other until the total loss of cognitive control of the situation. The underlying behavioural hypotheses in classifying the loss of airspeed information as "major" were not validated in the context of this accident. Confirmation of this classification thus supposes additional work on operational feedback that would enable improvements, where required, in crew training, the ergonomics of information supplied to them and the design of procedures.*

*The airplane went into a sustained stall, signaled by the stall warning and strong buffet. Despite these persistent symptoms, the crew never understood that they were stalling and consequently never applied a recovery maneuver. The combination of the ergonomics of the warning design, the conditions in which airline pilots are trained and exposed to stalls during their professional training and the process of recurrent training does not generate the expected behaviour in any acceptable reliable way.*

The lessons for Mooney pilots seem to be as follows:

1. What will you do when a primary instrument, such as the Airspeed Indicator, unexpectedly fails? When is the last time you received instruction for recognizing and remedying primary inop instruments?
2. Can you maintain situational awareness and recover if you find yourself in an unusual attitude? We think this requires strong multi-tasking skills.
3. Have you practiced landing your Mooney with an inop airspeed indicator? How about slow flight without your ASI?

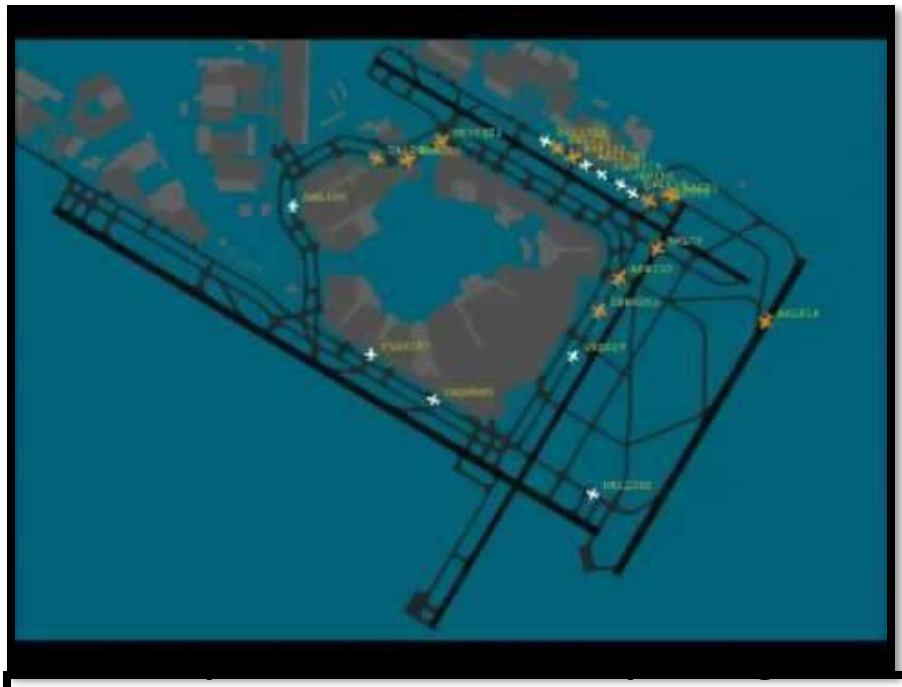
The primary lesson to be learned from this Air France crash is that ongoing primary training seems to be rather significant. Maybe it's wise to schedule periodic review of fundamental stick & rudder exercises with an instructor, maybe during a Flight Review or Wings Program, or just schedule this periodically.

The primary lesson to be learned from this Air France crash is that ongoing primary training seems to be rather significant. Maybe it's wise to schedule a periodic review of fundamental stick & rudder exercises with an instructor, maybe during a Flight Review or Wings Program, or just schedule this periodically. Seems to us that many Mooney pilots don't perform that many turns around a point, slow flight in the area of reverse command, recognizing inoperative primary flight instruments, landing with partial panel, and the like. Maybe we can take something away from this Air France crash.

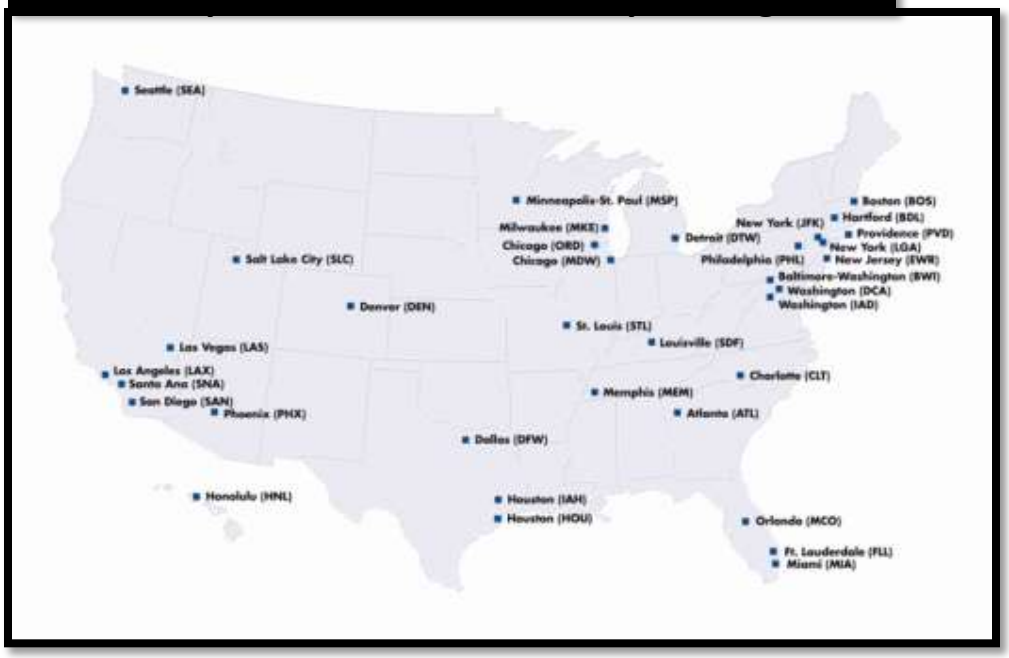
Click Here for the full report.



# When Should the Transponder be "ON"?

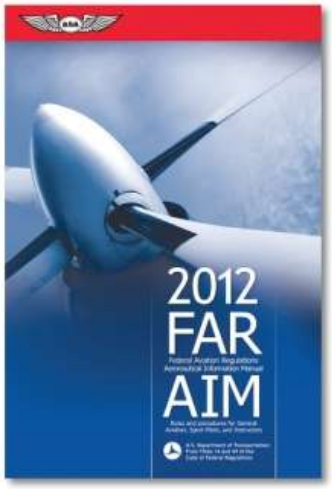


The short answer: From movement after startup to parking prior to shutdown. Here's why:
Air Traffic Control monitors surface movements with a ground taxi monitoring system called Airport Surface Detection Equipment, Model X, or ASDE-X. This equipment enables air traffic controllers to detect potential runway conflicts by providing detailed coverage of runway and taxiway movements.



Yes, I know. You probably don't operate into major US airports where ASDE-X is operating. So, why should a Mooney pilot in Camarillo or Corona, CA turn the transponder to ON prior to movement?

It's the pesky AIM that states, "All aircraft should turn transponders 'on' or normal altitude reporting position [ALT] prior to moving on the airport surface." (AIM 4-1-20 a3)



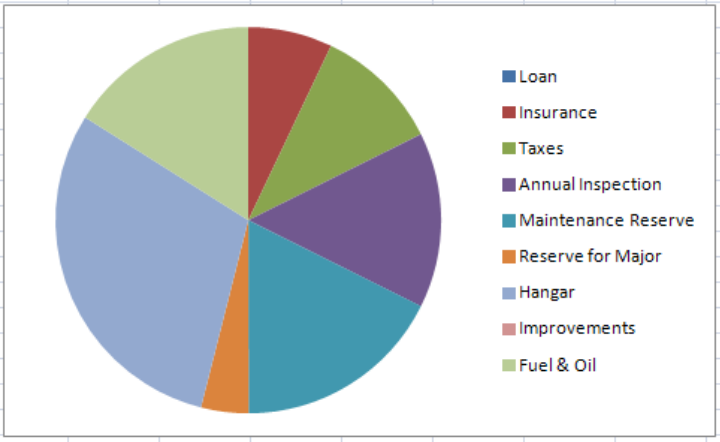

**If the AIM doesn't convince you, how's this for a good reason?**

**If you turn your transponder to "ON" or "ALT" after engine start, this habit pattern will help you avoid feeling like a *student pilot* the next time you call ATC, and they can't seem to find you because you forgot to turn your transponder to "ON" or "ALT".**


# What does it cost to own a Mooney!

Some say owning a complex airplane or a high performance airplane will cost you more. Some say Mooneys cost more than a fixed gear equivalent (What is that, anyway?). Others say it costs less to operate a vintage Mooney than any other airplane in its class. Again, we say, is there another airplane in its class? Regardless, we provide you with two things in this article. An objective analysis and a downloadable Excel spreadsheet which you can tailor to your Mooney, or perspective Mooney. Costs of ownership fall into two categories; 1) Fixed, and 2) Variable. Fixed include loans, insurance, hangar/tie down, annuals, etc. Variable include maintenance, oil, fuel, and other expendables based on usage.

| | | | | |
|---|---|---|---|---|
| Amount | $ 0.00 | | | |
| Rate | 6% | | | |
| Term | 10 | | | |
| Payment | $0 | | | |
| Total Payments | $0 | | | |
| Total Interest | $0 | | | |
| | | | | |
| Operating Costs | Monthly | Yearly | Cost | |
| Loan | $ 0.00 | | | |
| Insurance | $ 100.00 | $ 1,200.00 | | |
| Taxes | $ 150.00 | $ 1,800.00 | | |
| Annual Inspection | $ 208.33 | $ 2,500.00 | | |
| Maintenance Reserve | $ 250.00 | $ 3,000.00 | | |
| Reserve for Major | $ 56.25 | $675.00 | $ 27,000.00 | |
| Hangar | $ 425.00 | $5,100.00 | | GPH |
| Improvements | $ 0.00 | $ 0.00 | | |
| Fuel & Oil | $ 227.60 | $2,731.25 | $ 5.75 | 9.5 |
| **TOTAL / MO** | **$ 1,417.19** | **$17,006.25** | | |
| Total / Hour | $ 340.13 | | | |
| | | | | |
| Total Hrs/Yr | 50 | | | |




This cost of Mooney ownership model is based on average costs for an M20C, D, or E. It assumes a Lycoming O360 or IO-360 and an average fuel burn of 9.5 gph. Click Here to download this model. You input into the shaded fields. All the others are computed. The pie chart shows the distribution of costs. This model is easily adaptable to medium and long body Mooneys.

First of all, the national average hours a typical pilot in the USA flies per year is 45 hours. Owners tend to fly more hours per year, but the average is still below 100 hours. To own a plane and even get close to making it financially attractive vis a vis renting means you want to fly a lot per year. Fortunately, vintage Mooneys can be found on the market today that make the breakeven workable.

The first cost is your **Aircraft Loan**. Let's say you buy an M20E for $50,000. Additionally, let's say you are thinking of a loan for 10 years, with $5,000 down. That means you are going to finance $45,000. Your cost of operation for the first 10 years will include the principal & interest (P&I), which will be useful for your cashflow. But it is not really a cost of ownership over the life of the M20E for you. Our reasoning is that you can turn around and sell the plane, for say $44,000. So your total cost is $6,000. If you take care of your M20E, in this example, you might get the same or even more for her when you sell.

The next cost we consider is **Insurance**. Most owners carry $1M liability and Hull Insurance. On the liability side, the $1M pays out $100,000 per claim. A more expensive option is $1M "smooth" which means that all


claims total $1M, but an individual claim can be up to $1M. Your insurance will vary based on many criteria including your experience, your ratings, your amount of hull, and your amount/type of liability. Picking the amount of Hull Insurance is important. If you go low, you risk the insurance company declaring your plane "totalled" in an accident. If you pick too high, youwould be paying higher premiums.

**Taxes** and death are the only guaranteed things in life. Unfortunately, it is cheaper to die than pay taxes. In this case, we are not referring to Sales Taxes, which you include in the cost of buying. But rather, we are referring to Use Taxes, sometimes referred to as Unsecured Property or Luxury Taxes. California is the most notorious state for this tax and your plane is taxed at the same rate as your home. Your tax will vary by state, or country.

The **Annual Inspection** is another fixed cost. Annual costs are broken down into 2 categories; 1) the cost of the annual inspection, and 2) the cost to fix things, or non-compliances with airworthiness. Often, an owner will add avionics or add a speed modification during an annual. This type of cost should fall under **Improvements**. Your inspection cost may be based on the number of hours that Mooney indicates it takes. Other mechanics simply charge the time it takes them, not "book". This cost is very predictable, hours x $hourly rate. Fixing non-compliances is variable and is based on how well you maintained your Mooney over the course of the year, normal wear and tear items, and unfortunate things.

The next cost area is a **Maintenance Reserve**. This includes an estimation of maintenance that might be performed over the course of a year. It does not include Annual inspection costs. This could be avionics, tires, filters, biscuits, etc., that may need servicing between annuals.

**Reserve for Engine Major** is an oft overlooked cost by owners, when estimating the cost of ownership. If you plan for a major overhaul at TBO, usually 2000 hours, and the cost of replacing that Lycoming O360 is $27,000 or that IO-550 is $48,000, then your hourly cost is that number divided by 2000 to get your hourly cost.

**Why I need a larger hangar!**

**Hangar or Tiedown fees** are easy to compute, and need to be included, but don't need much explanation. But the owner can incur higher maintenance costs and lower re-sale value if the aircraft is tied down and not secured in a hangar. Heat, cold, humidity, wind, sun, and other factors are generally bad for your idle airplane.

**Improvements** are also a simple category. If you have plans to purchase a LASAR mod, or upgrade your panel, then you include those costs, both product and installation, in this category.

The last thing you need to include is the number of hours you fly, the fuel burn per hour, and the cost of 100LL. Our model, above will do all the rest for you.


# November, 2012

***LightSquared is at it again!*** After filing bankruptcy in May, Aviation's GPS enemy LightSquared is now seeking approval for a plan that will allow it to share airwaves with federal agencies. In filings with the Federal Communication Commission, the company says this will solve the technical problems that prevented the launch of its nationwide 4G network. Click to READ MORE (First reported Oct 2, 2012)

***The FAA intends to cancel 1000 ground based approach procedures*** within one year. They will establish the criteria next month and publish their intentions in January, 2013. They do not intend to replace these approaches, and they will not eliminate an approach if it is the only approach to the airport. One would think that they would have to have a public comment period before just pulling the plug on VOR/DME approaches because of the significant portion of the general aviation fleet that has not upgraded to IFR certified GPS and still relies solely on this type of equipment.


***Pilots with aircraft that are equipped with an Automatic Dependent Surveillance - Broadcast (ADS-B)*** transmitter/receiver or transceiver and a cockpit display of traffic information (CDTI) can now receive free traffic and weather information in the cockpit while in the following airspaces: Phoenix Sky Harbor (PHX), Dallas/Ft. Worth (DFW), John Wayne-Orange County (SNA) and New York LaGuardia (LGA).


***Lockheed Martin Flight Services (LMFS) launches*** the Automated Flight Service Station (AFSS) Pilot Web Portal with the new Adverse Condition Alerting Service (ACAS), designed to enhance safety and convenience for pilots who use LMFS to file flight plans. This serevice will be available on November 5th. Pilots who register online and opt-in for ACAS via the Pilot. Go to Flight Services https://www.afss.com/ on November 5th and sighn up. CLICK HERE for more information. See also, AOPA Summit News

***The FAA will make a variety of critical decisions regarding aviation-related issues*** over the next two to three years – decisions that will "define what aviation looks like in this country for the next 25, 30 or 40 years," the FAA's top official said Thursday at the Wichita Aero Club. FAA Acting Administrator Michael Huerta said the agency wants to "enhance general aviation safety while cutting certification costs in half," according to a report in the Wichita Eagle.

The AOPA Foundation's Air Safety Institute has released "Critical Information: The Passenger Safety Briefing" video, which covers items that should be part of every passenger safety briefing. ASI created the video in response to an NTSB safety recommendation for better preflight safety briefings of passengers in the event of pilot incapacitation after an accident, officials said. Click to READ MORE

***Search and Rescue on the Horizon.*** Flight tracking devices such as Spidertracks could alert flight service specialists—and kick off search and rescue efforts—immediately upon a lost signal or distress call through a system in development by Lockheed Martin. Read More

Garmin GNS 400W / 500W Series Unit's Software Upgrade to Main Software Version 5.00 and GPS Software 5.0. COMPLIANCE is Optional for Fixed Wing Aircraft – users may install this software at their discretion, and this update is not warranty reimbursable. CLICK HERE for the Notice (PDF)


The ***2010 Nall Report*** is available by clicking here. Total flying hours decreased 10% from 2008 to 2009, while accidents declined 5%. Seventy (70%) of non-commercial GA accidents were pilot related. The balance was 17% Mechanical and 13% Other. Retractable aircraft accounted for 19% of non-commercial GA accidents. This annual report is worth a read.


**Hate Airlines? Fly Your Mooney!**




**November 10**, Punta Gorda, (PGD)
**December 8**, Lakeland (LAL)

## Greatest Mooney Pilot Lies

- I flew 155 kts at 7.2 gph in my M20C to this fly-in
- Me? I've never busted minimums
- We will be on time, definitely before the Cirrus guys
- Pardon me, ma'am, I seem to have lost my jet keys
- I have no interest in flying for the airlines
- I fixed it right the first time, it must have failed for other reasons
- All that turbulence spoiled my landing
- I'm a member of the mile high club
- I only need glasses for reading
- I broke out right at minimums
- The weather is gonna be alright; it's clearing to VFR
- Don't worry about the weight and balance — it'll fly
- If we get a little lower I think we'll see the lights
- I'm 22, got 6000 hours, a four year degree and 3000 hours in a Lear
- We shipped the part yesterday
- I'd love to have a woman co-pilot
- All you have to do is follow the book
- This plane outperforms the book by 20 percent
- We in aviation are overpaid, under worked and well respected
- Oh sure, no problem, I've got over 2000 hours in that aircraft
- I have 5000 hours total time, 3200 are actual instrument
- No need to look that up, I've got it all memorized
- Sure I can fly it — it has wings, doesn't it?
- We'll be home by lunchtime
- Your plane will be ready by 2 o'clock
- I'm always glad to see the FAA
- We fly every day — we don't need recurrent training
- It just came out of annual — how could anything be wrong?
- I thought YOU took care of that
- I've got the field in sight
- I've got the traffic in sight
- Of course I know where we are
- I'm SURE the gear was down

Did you know what speed the average bird stalls? The answer is 11 mph.

# Prescott, AZ VMG Fly-In (KPRC)

**Saturday, September 22nd**

Eight Mooneys carried 25 people to Prescott for a fly-in get together. There was an excellent educational opportunity in the form of an informative UAV presentation and lunch.

Our event was expertly planned by Jim and Marge Wilkins and hosted/catered by Legend Aviation.
Our planned speaker was VMG Member Jerry Proctor, Deputy Commander to the Commanding General, Fort Huachuca, Sierra Vista, AZ. Friday night, he had home structural difficulties and found it necessary to cancel. Jerry's friend, Paul Nelepovitz, Assistant Professor, Unmanned Air Systems/UAS, College of Aviation, at Embry-Riddle Aeronautical University graciously agreed to speak.
Paul's presentation was full of information and extremely interesting.

Currently, UAVs are allowed to fly only in Restricted airspace. If there is a need for a UAV to fly to a Restricted Area, it is is accompanied enroute by a manned chase airplane.

There are many different UAVs – fixed wing and rotary. They have various missions from almost silent surveillance to unexpected mayhem. Their domestic applications are incredibly unique, i.e., beach water rescue.

Many universities are now offering a UAV program and Embry-Riddle is no exception.

Professor Nelepovitz teaches the UAV classes, develops new UAV classes and is currently evolving Embry-Riddle's UAV minor into a major. Graduates will work and help develop this incredible new industry.

***Eight Mooneys graced Legend 's ramp***

of Contents


*Our Host: Jim Wilkins*

*Speaker: Paul Nelepovitz*

*Hanging on every word*

# The Master of Your Mooney

**By Jim Price**


## Landing Cherokee Hits Row Of Parked Planes

***Friday, 14 Sep 2012, French Valley Airport, (F70) Murrieta, CA. Insurance adjusters were busy after a Piper Cherokee crashed into a taxiing Cessna 172 and a row of parked aircraft. Up to eight parked aircraft were damaged; some were totaled.***

Riverside County Sheriff Sgt. Dean Spivacke said that a Cherokee was landing when it was hit by a strong crosswind gust. "It was quite breezy today, and he caught a crosswind that threw him off course," Spivacke said. The pilot declined to speak with reporters. Witnesses in an airport restaurant said that the Cherokee hit the taxiing 172 first and stopped when it split a Cessna 180 into two pieces.

> The NTSB and FAA are investigating, but you can bet their final report won't indicate that "an evil wind made him do it". It will read something like this: "The pilot in command just flat out failed to maintain aircraft control."

Unfortunately, failure to maintain aircraft control happens too often. Here are a few examples from the NTSB annals of Mooney accidents:

### *Power, Trim and Right Rudder! At the same time, please . . .*

February, 2012, Urbana, IL (C16). A Mooney **M20K** pilot was making an approach and encountered a "turbulent wind". The airplane ballooned during the flare and the pilot executed a go-around. The left wing hit the ground and the Mooney came to rest next to a house.

NTSB finding: The pilot **failed to "maintain aircraft control during the go-around**." 1 Serious Injury.

***Neither Fog nor Ice** stays this pilot from the swift completion of his appointed rounds.*

December, 2010, Colorado Springs, CO (KCOS). A Mooney **M20E** pilot was above the cloud layer preparing for an instrument approach. AIRMETs were issued for IFR, mountain obscuration, turbulence, and icing conditions. Prior to and during the approach, the air traffic controller, related two pilot reports

of icing conditions encountered immediately after departure. Visibility was reported as less than 1/4 mile in freezing fog, with a ceiling at 100 feet. The visibility required for a successful ILS approach at KCOS is 1/2 mile. The airplane was not equipped with anti-icing or deicing equipment and was not approved for flight in known icing conditions.

| CATEGORY | A | B | C | D |
|---|---|---|---|---|
| S-ILS 17L | | 6387/18 | 200 (200-½) | |

The airplane entered the clouds at 8,500 feet and reported a missed approach several feet above the decision altitude (6387), stalled and struck the ground . The ground scars and damage to the airplane were consistent with a low-airspeed and high-angle-of-attack impact.

The NTSB declared that the accident was caused by: 1) The pilot's decision to initiate an approach despite not having the visibility required for the approach. 2) The pilot's decision to fly in reported icing, in an airplane that was not certified for flight in icing conditions.

3) The pilot **failed to maintain control of the airplane during the missed approach.** 2 Fatal.


### *Hey! Watch Your Speed*

July, 2008, Elbert, CO, with a field elevation of over 7,000 feet MSL. A pilot flying a **M20M (TLS/Bravo)** learned some some valuable lessons about hitting the runway with the nose gear first and the sluggish nature of a high density altitude go-around. After the nose wheel "strike", the pilot executed a partial power go-around. He sensed that he was sinking, so he applied full throttle. With a density altitude of 9,674 feet, even 270 tubocharged horses couldn't pull him away from terra firma. The Bravo settled back to the ground, striking the tail and landing left of the runway, then sliding several hundred feet on the belly.

Witnesses said: " . . . the Mooney headed north at slow speed, nose high attitude. [The pilot] added power and it mushed down."

"When I saw the nose attitude of the aircraft (very nose high) with gear extended I knew they were in trouble."

NTSB finding: The pilot **failed to maintain aircraft control during a go-around,** and stalled the aircraft. Contributing to the accident was the high density altitude. 2 uninjured.

### *What Just Happened?*

When a pilot initiates a go-around, it's a rare occasion, spiked with surprise. Pilots often wait too long to react, and when he finally adds power, the airplane's aerodynamic need to pitch up and turn left can be overwhelming. The pilot now has his hands full and can't seem to remember his name, let alone what he should do now! Should I retract the gear? Where should I put the flaps? Where has my mechanic hidden that flap control?

### *We can be safer pilots by doing a few simple things:*

1. Practice a go-around with a CFI on your next Wings flight, or BFR. If you feel a little confused on the first attempt, do another one! Maintain some proficiency in the maneuver by occasionally doing a practice go-around.
2. Every time you make an approach for landing, realize that a go-around could happen. Go over the steps in the go-around procedure. Remind yourself of all that nose up trim that will try to put you in a stall and the torque that will attempt to turn you to the left.
3. Don't put yourself in a self imposed go-around crisis. Whenever possible, make the decision to go-around early.
4. Remember – You're the pilot; the Master of your Mooney. Not the other way around!

## Mooney Maintenance with LASAR Precision

By Paul Loewen, Owner of Lake Aero Styling & Repair (LASAR)

# PILOT CONDUCTED PREVENTIVE MAINTENANCE

**R**ecent maintenance record reviews at our Mooney Service Center has shown some misunderstandings of what preventive maintenance is, what a pilot can do, how the work must be done and how the work must be signed off for returning the aircraft to service.

For review: The person performing the work on an aircraft owned or operated by that pilot must hold at least a private pilot certificate. Upon completion of the work, a maintenance record entry must be made that contains: 1) description of work performed, 2) date of work completion, 3) signature and certificate number of person approving the aircraft for return to service.

Performance rules in preventive maintenance shall use the methods, techniques and practices prescribed in the manufacturer's manuals, including any required special tools and/or test apparatus. Work conducted shall be in such a manner and use materials of such quality, that the condition of the aircraft will be equal to the original.

**Preventive maintenance is limited to the following work, provided it does not involve complex assembly operations:**

1. Servicing landing gear shock struts by adding oil, air or both.
2. Servicing landing gear wheel bearings, ie. cleaning and greasing.
3. Replacing defective safety wiring or cotter keys. Learn properly.
4. Lubrication not requiring disassembly other than removal of nonstructural items, ie., cover plates, cowling and fairing.
5. Making simple fabric patches - see FAR for specifics.
6. Replenishing hydraulic fluid in the hydraulic reservoir.
7. Refinishing decorative coating, when removal or disassembly of any primary structure/operating system is not required. See FAR/manuals for proper paints, materials, fire resistance, etc.
8. Applying preservative/protective material to components when no disassembly of primary structure or operating system is required. Insure such coating is not prohibited nor contrary to good practices.
9. Repairing upholstery/decorative furnishing of cabin/ cockpit and does not require disassembly of primary structure/operating system - interfere and/or affect these items.
10. Making small simple repairs to fairings, nonstructural cover plates, cowlings, small patches & reinforcements not changing the contour so as to interfere with proper airflow. Replacing side windows where the work does not interfere with structure or operating system, ie, controls, electrical equipment, etc.
11. Replacing safety belts.
12. Replacing seats or seat parts with approved parts, not involving disassembly of primary structure or operating system.
13. Trouble shooting and repairing broken circuits in landing light wiring.
14. Replacing bulbs, reflectors, lenses of position and landing lights.
15. Replacing wheels and skis where no weight & balance is involved.
16. Replacing cowling not requiring removal of propeller or flight controls.
17. Replacing/cleaning spark plugs, setting of spark plug gap clearance.
18. Replacing any hose connection, except hydraulic connections.
19. Replacing prefabricated fuel lines.
20. Cleaning/replacing fuel and oil strainers or filter elements.
21. Replacing and servicing batteries.
22. Replacing/adjustment of nonstructural incidental standard fasteners.
23. Installation of anti-misfueling devices to reduce size of tank filler openings, with specific manufacturer's parts and instructions.
24. Removing, checking and replacing magnetic chip detectors.
25. Replacing elastic shock absorber cords on landing gear

Note: Airworthiness Directives are not included in Preventive maintenance, and can only be complied by pilot/owner when specifically authorized in that specific AD by the issuing FAA office, ie. Bendix 76-07-12. References: FAR 91.417, 43.3, 43.5, 43.7, 43.9, 43.13 Appendix A.

| **Service & Maintenance Manuals** | **Code** |
|---|---|
| M2OB 61 Service & Maintenance | MAN 103 |
| M20C, D, E & F 62-67 Serv. & Maint. | MAN 104 |
| M20C, E, F & G 68-78 Serv. & Maint | MAN 106 |
| M20J 77-93 Service & Maintenance | MAN 122 |
| M2OK 79-90 Service & Maintenance | MAN 133 |
| M2OL 88 Service & Maintenance | MAN 140 |
| M2OM 89-93 Service & Maintenance | MAN 150 |
| M2OR 94 Service & MaintenancE | MAN 160 |
| M2OS Service & Maintenance | MAN 170 |
| M20TN Service & Maintenance | MAN 180 |
| **Parts Manuals** | |
| M20B, C, D & E 61-64 Parts Manual | MAN 202 |
| M20C, E & F 65-67 Parts Manual | MAN203 |
| M20C, E, F & G 68-76 Parts Manual | MAN 205 |
| M20J 77-94 Parts Manual | MAN225 |
| M2OK 79-90 Parts Manual | MAN234 |
| M2OL 88-89 Parts Manual | MAN240 |
| M2OM 89-92 Parts Manual | MAN251 |
| M2OR 94 Parts Manual | MAN260 |
| M2OS Parts Manual | MAN262 |
| M2OTN Parts Manual | MAN280 |
| **Miscellaneous Manuals** | |
| Set of Service Bulletins | MAN 301 |
| OECO Regulator Service Manual | MAN 041 |

**VENDOR ADDRESSES OR PUBLICATIONS**

***ENGINES***

**LYCOMING**: The following maintenance publications can be obtained through TEXTRON Lycoming Division, Williamsport, PA 17701.

Overhaul Manual for TEXTRON Lycoming Aircraft Engines, Direct Drive Models, Manual NO. 60294-7.

Illustrated Parts Catalog - Manual NO. PC-206 for TEXTRON Lycoming 10-360, AI0-360, H10-360, L10-360 and TIO-360 series aircraft engines.

Operators Manual - No.60297-12, for TEXTRON Lycoming 0-360, HO-360, 10-360, AI0-360, L10-360 and TIO-360 aircraft engines.

Service Bulletins - Specify model of engine for which maintenance data is desired.

**CONTINENTAL:** The following maintenance publications can be obtained through Teledyne Continental Motors (TCM) Aircraft Products Division distributors in your area or from TCM, P.O. Box 90, Mobil, AL 36601

Overhaul Manual - Form Number X30596A, for TCM TSI0-360

series aircraft engines. Illustrated Parts Catalog - Form

Number X30597A, for above series engines.

Operators Manual - Form Number X30536, for TCM models TSIO-360-G, -GB engines, Form Number X30571 for TSIO-360-LB aircraft engine and Form Number X30584 for TSIO-360-MB aircraft engine Maintenance and Operator's Manual.

Service Bulletins - Specify model of engine for which maintenance data is desired.

***PROPELLERS***

**McCauley** Propellers: Obtain publications from McCauley Accessories Division, Cessna Aircraft Company, 3535 McCauley Drive, Vandalia, OH 45377, P. 0. Box 430

Service Manual - No.780630 for McCauley C200 series constant speed propellers.

**Hartzell** Propellers: Obtain publications from Hartzell Propeller, Inc., 350 Washington

Avenue, Piqua, OH 45356 Blade Specification - Manual No.133-A.

Overhaul Instructions - Manual No.113-B.

***MAGNETOS***

**Bendix Scintilla Magneto**: Obtain Service data for Bendix Series 2000 or 3000 magnetos from TCM, P. 0. Box 90, Mobil, AL 36601. (205)438-3411.

**Slick Magnetos**: Obtain Service data for Slick magnetos from Slick Aircraft Products, Unison Indust, 530 Blackhawk Park Ave., Rockford, IL 61104, (815)965-4700.

***TURBOCHARGERS***

Maintenance and Overhaul Manual Number G70 for the RAJAY/Rotomaster turbocharger can be obtained from Roto- Master, c/o Garrett Airesearch Aftermarket Div., 2511 So. Edison Way, Compton, CA 90220-6035. Maintenance and Overhaul data on Airesearch turbocharger, Model TA0401

***FUEL INJECTORS***

Fuel Injector - Obtain service data for fuel injectors from Precision Airmotive, 3220-100th Street , S.W. #E Everett, WA 98204.

***CARBURETORS***

FACET Aerospace Products, Co., 1048 Industrial Park Rd, Bristol, VA 24201 (Marvel Schebler)

## Overhaul and Replacement Schedule

**LANDING GEAR**

Actuator/No Back Spring - 1000 Hrs. All other Components - On Condition

Shock Biscuits - On Condition per dimensions in Service Manual

**POWERPLANT**

Engine – TCM, 1800 Hrs., Lycoming, 2000 Hrs. Propeller – McCauley 1800 or 5 yrs, Hartzell 2000 Hrs or 5 yrs (Per S.L. 61$)
Magneto - Engine Overhaul (TBO). Induction Air Filters (Paper) - 500 Hrs. All other Components - On Condition. Turbo Clamps - 200 Hrs. (Inspection)

**FUEL & OIL SYSTEM**

Fuel Selector Valve (Anderson-Brass)* - 500 Hours * Flexible Hoses (ALL except as Below) - 7 years or Engine **0/H,** whichever occurs first.
Aeroquip 601 Fuel Hoses - 24 Months. All other components - On Condition
Turbo Oil Hoses - 5 Years per AD 80-16-05. Fuel Caps "0"Rings - 1 Year per AD 85-24-03

**INSTRUMENTS**

Vacuum Regulator Garter Filter - 100 Hrs.

Filters - Vacuum Pump - 500 Hrs. or Once a Year

Filters - Gyro Instrument - 500 Hrs. or Once a Year Other Components - On Condition
Altimeter, Pitot, Transponder - 2 Yrs (VFR/IFR Certification) IFR Certification must be performed to 25,000/28,000 feet Max. Limit to which the aircraft is certified (see P.O.H.)

**ELECTRICAL COMPONENTS**

All Components - On Condition

**FLIGHT CONTROLS**

Lubrication - 1 Year or 100 Hrs. per AD 73-21-01. All Components - On Condition

**MISCELLANEOUS SYSTEMS**

Vacuum Pump Primary (Airborne) - 500 Hrs. & Engine 0/H (TBO).
Stand-by Vacuum Pump - Inspect at 500 Hrs.
E. L. T. Battery - 2 Yrs or 1 Hour total use time

**Oxygen Cylinders** *

Lt. Wt. Steel Cylinders - 24 Yrs. or 10,000 recharge cycles.
Composite Cylinders - 15 Yrs. or 10,000 recharge cycles.
*Hydro Test: Dot-3HT-3000 - 3 years- As stamped on cylinder. Dot - 5HT-3000 - 5 years - As stamped on cylinder.

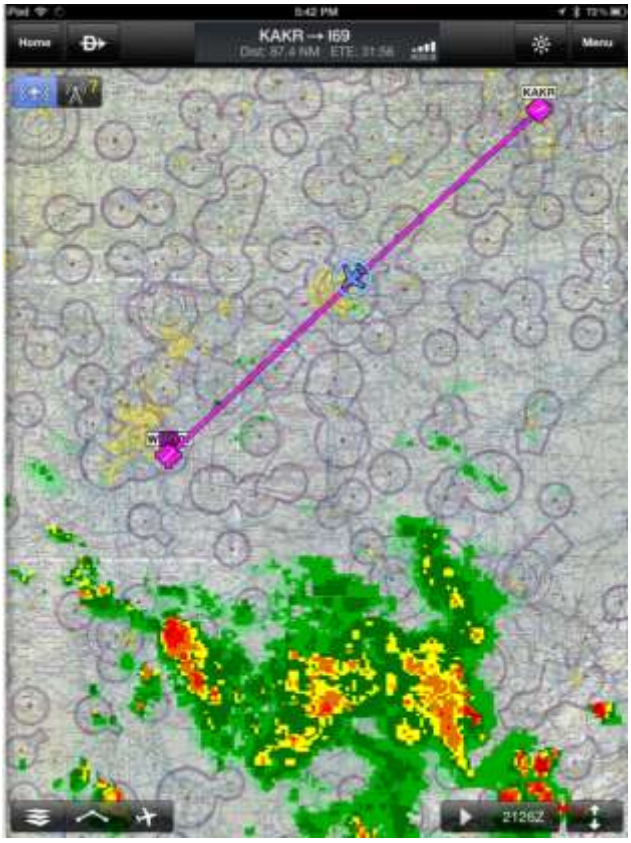
Besides research of applicable Airworthiness Directives (ADs) (mandatory) and Service Bulletins (recommended), these time limit components are also mandatory or recommended. This information has been extracted from FAR's, Mooney Service Manuals, AD index and other vendor service manuals. I hope you will find this information useful and educational and will help


# Garmin GDL 39 ADS-B Receiver

by Phil Corman

This Garmin unit is pretty cool. It provides access to ADS-B Weather and also "limited traffic" (more on this later). Essentially, the GDL 39 is an ADS-B "In only" receiver. It does not transmit ADS-B. So for the time being, nobody else knows about you from a traffic standpoint. XM provides more weather options, but ADS-B is free so you don't have to pay XM $30-$55 per month. The unit connects to your iPad wirelessly via Bluetooth. This enables you to place the GDL 39 above your glareshield without draping wires down to your iPad. The GDL 39 supports other devices such as the portable Garmin GPS 496, but these other portables must employ a wired connection since they do not support Bluetooth. Did we mention that the GDL 39 has a built-in WAAS GPS?

**Weather Features**




If you use the GDL 39 with the Garmin Pilot iPad App, you will get all of the ADS-B weather including NEXRAD radar, METARs, TAFs, Winds Aloft, Pireps, TFRs, Airmets/Sigmets and NOTAMs. Unlike XM weather that is delivered via satellite, this unit uses ADS-B which uses ground stations, so you will not be able to receive weather information until you are airborne. That altitude you will need to acquire weather will be correlated with the proximity of the ground stations.

**Traffic Features**

The GDL 39 has a dual band receiver (978 UAT and 1090 ES) which allows for reception of ADS-B traffic. This is nice, but you must realize that the GDL 39 is a receive-only device, so you will only get limited traffic. This is because you are not sending ADS-B OUT with this unit. You will only see other traffic that is transmitting ADS-B which is mostly airline traffic that employs the 1090 ES transponders. This sophisticated traffic display is very similar to what's shown on Garmin's panel mount traffic systems. You can configure several options here, including altitude filters to show unrestricted traffic, traffic above (useful during climbs), a normal view setting (useful during cruise), and a traffic below view (useful during descents). The display will alert you by announcing traffic

targets both audibly and visually. Spoken audio alerts announce "Traffic, Traffic" to get you looking right away.


You can also toggle the motion vector originating from the traffic to show either a relative vector, (Garmin calls it *TargetTrend*) or absolute vector. The relative vector is particularly useful since it shows the aircraft's motion relative to your position and ground speed. For example, if you were overtaking an aircraft that was heading in the same direction as you but at a slower ground speed, the relative vector would actually be pointed opposite its direction of flight indicating that you are overtaking the aircraft. You can also tap any of the traffic targets to display N#, direction, ground speed, pressure altitude, climb/descent rate and closure information. Just don't let the traffic display lull you into a false sense of security since it's only showing the big iron in the sky. You'll get more traffic displayed if there is another airplane nearby that is transmitting ADS-B OUT on 1090 because you will essentially piggyback the ADS-B transmission to him. You can always buy the Garmin GDL 88 or GTX 330ES/33/23 ES transponders to get ADS-B OUT capability.

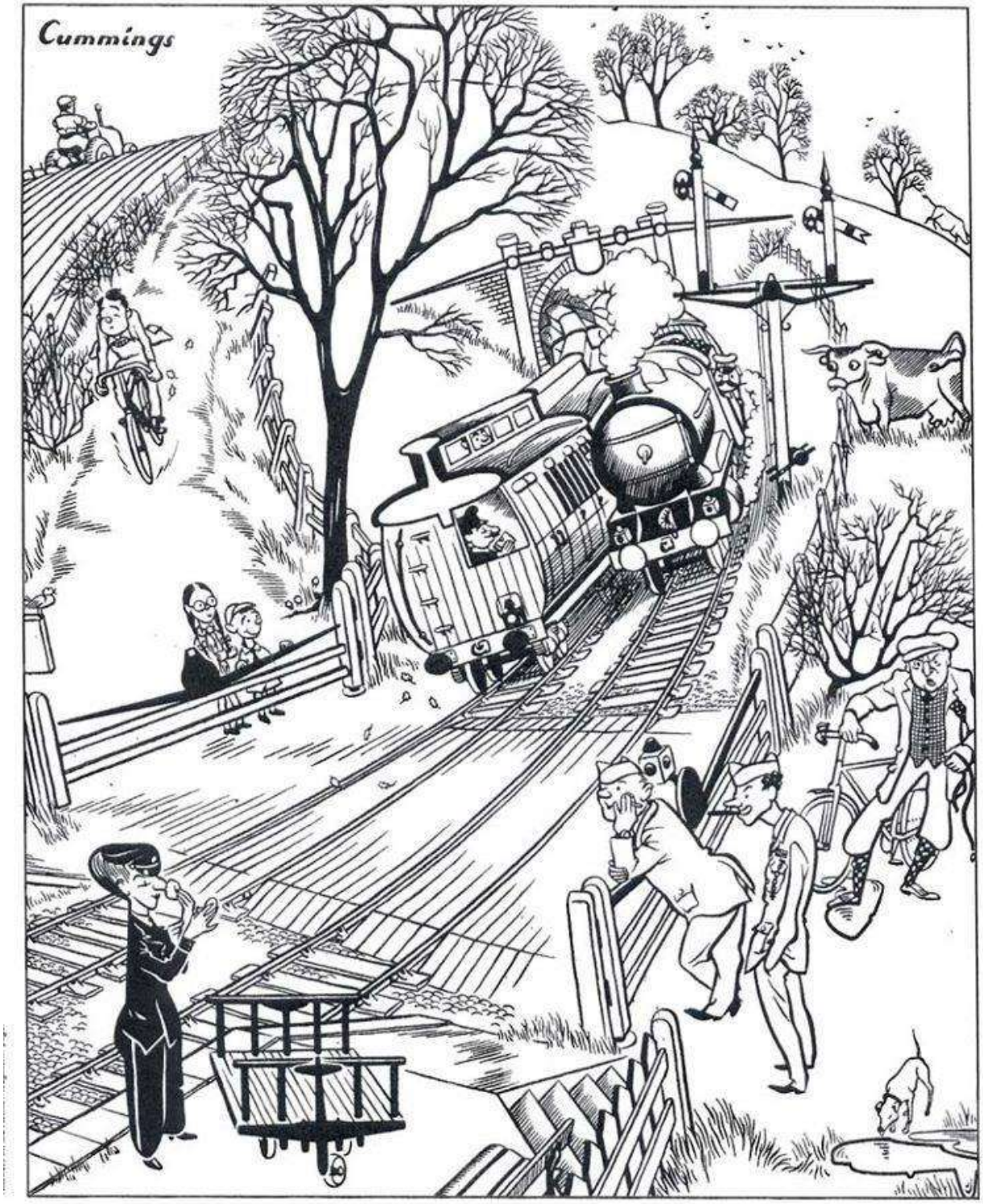
**Wireless Features**

With built-in Bluetooth capability, the GDL 39 can wirelessly send the data it collects to compatible apps like Garmin Pilot, and soon to the aera® 795/796. The GDL 39 is capable of simultaneously providing wireless data to 2 devices while hardwired to a third. As opposed to using a WiFi link, Bluetooth lets you stay connected while on the ground so you can continually receive the latest weather reports as long as you have a data connection – no manual switching of networks is required. Just set it up once and it will automatically remember and pair with your mobile device the next time you hop in the cockpit.

**Compatible Devices**

- iPad running the Garmin Pilot App[1]
- Aera 795/796[1]
- Aera 500 series
- G3X
- GPSMap 695/696
- GPSMap 495/496
- GPSMap 396

[1] Bluetooth capable




*There are thirteen aeroplanes, Allied and Enemy, hidden in this scene. Can you find and name them?*