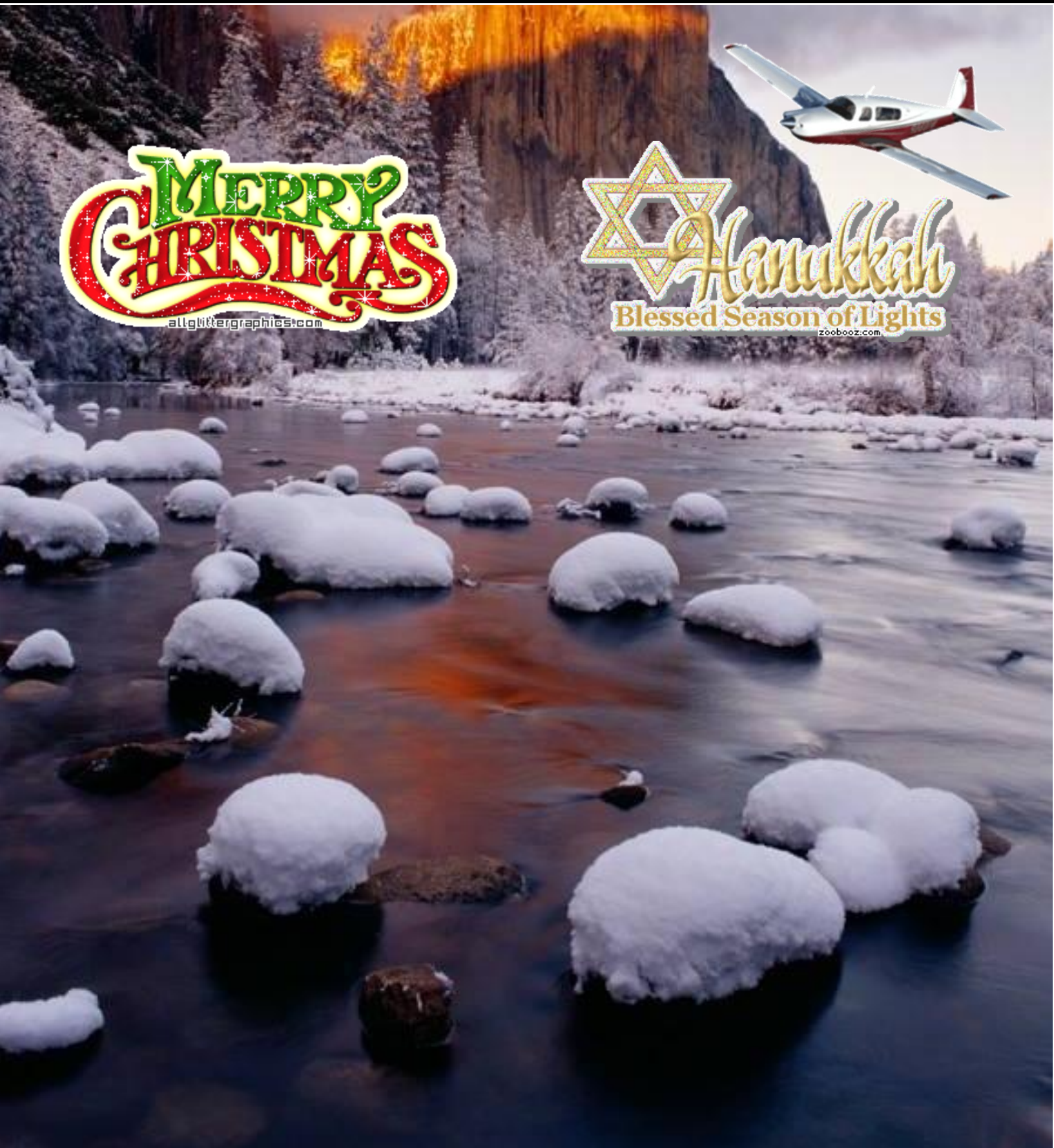


The Mooney Flyer

The Official Online Magazine for the Mooney Community
www.TheMooneyFlyer.com

December 2018



**MERRY
CHRISTMAS**
allglittergraphics.com

Hanukkah
Blessed Season of Lights
zoobooz.com



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Editors

Phil Corman & Jim Price

Contributors

Bruce Jaeger | Bob Kromer | Tom Rouch | Paul Loewen | Geoff Lee | Linda Corman

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Ask the Top Gun – Top Gun Tom Rouch answers your questions

Product Review – *TruTrak VizionPMA*

Upcoming Fly-Ins – *Fly somewhere and have fun!*

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Must Mooney Flycation... great flight... amazing place

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From the Editor

Phil Corman

V_a Maneuvering Speed – Not all you think it is

Most of us were taught that V_a speed would protect our Mooney in turbulence by stalling before any structural damage occurred. Well, that's not really very accurate. It only protects your Mooney from a single flight control, in one direction only, and in smooth air. In other words, it only protects you in a hypothetical and mostly useless situation. Still, slowing to V_a in turbulent air makes sense anyway.

There's Another Airplane on the Runway

Can you land if there is another airplane on the runway? At a controlled airfield, the answer is YES if the controller clears you to do so. Typically, the controller will be required to have 3,000' on the runway and the aircraft on the runway is the same or higher category.

At an uncontrolled field, there is no guidance in the AIM or FARs that we could find except for: 14 CFR 91.13 - Careless or **reckless operation**. (a) Aircraft **operations** for the purpose of air navigation. No person may **operate** an aircraft in a careless or **reckless** manner so as to endanger the life or property of another. (b) Aircraft **operations** other than for the purpose of air navigation. So can you land at an uncontrolled field with another aircraft on the runway. In general, we think it is unwise. A go-around is much preferred. But, if there is a long runway, say 5,000', and the first aircraft is 3,500' down the runway and you are sure that you can land and hold short of it, there is no FAR against it.

Fibs, Fibs and More Fibs

Many pilots say they love flying at night, and to be accurate, it is magnificent, especially on a clear moonlit evening. To hear pilots rave about it, you would think we fly a lot after dark. But according to AOPA, less than 5% of our private pilot hours are flown at night.

Private Pilots claim they fly a lot. Usually you hear 120-150 hours per year. But the truth is the average is close to 40 hours per year.

Mag Checks

Mike Busch says we are doing it all wrong. Don't look for RPM drop on each Mag. Look for smooth engine operation on each mag and a rise on all EGTs. Also, perform a Cruise Mag Check when the engine is under more stress.

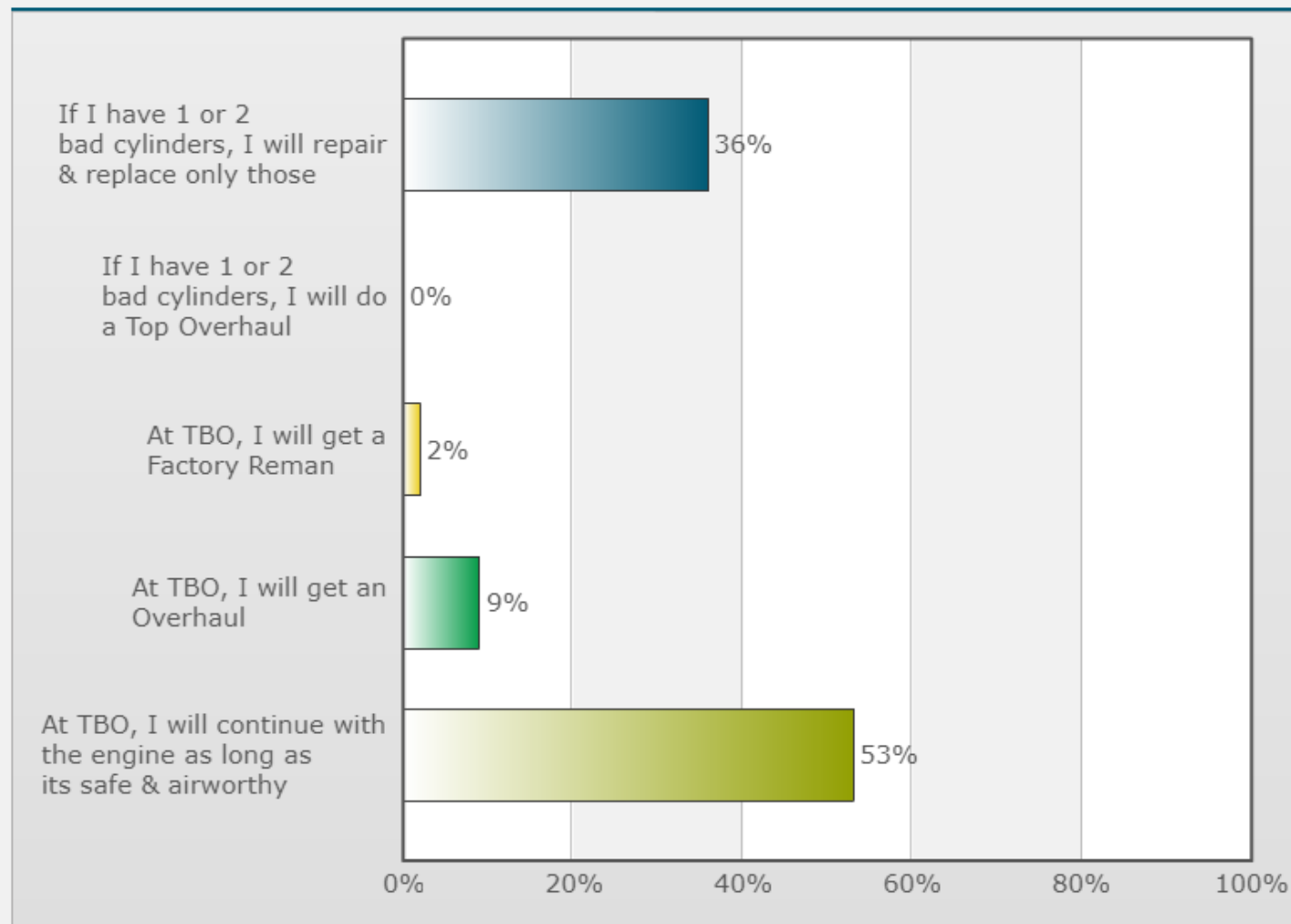
% Power Rule of Thumb

Calculate your BHP with RPM/100 + MP. If 44, then 55%, 47 then 65%, 50 then 75%

Regarding my Engine:

Poll created by [Phil Corman](#) on 10/01/2018

Poll Results



Next month's poll: "Do You Have a 406ELT?" [CLICK HERE](#) to vote.



APPRAISE IT
Check Your Mooney's Value



[M20C](#) [M20E](#) [M20F](#) [M20G](#)
[M20J](#) [M20K](#) [M20R](#) [M20M](#)



Mooney Instructors



CLICK
HERE

for the most
comprehensive list of
Mooney instructors in
the United States

PROP SUPER CENTER



We won't be undersold!

Mooney Props



Airplane Eligibility

Prop Style

STC

M20A-J	2 bladed Scimitar	SA0241CH-D
M20C, D, E, F, G	3 bladed	SA4529NM
M20J	3 bladed	SA4529NM
M20K	3 bladed	SA1505GL
M20R	3 bladed Scimitar	SA02004CH
M20R, S, TN	3 bladed Scimitar	SA03024CH
M20R, S, TN	3 bladed Composite	SA02482CH



**McCAULEY
BLACKMAC**

Airplane Eligibility

Prop Style

Part

M20A-G	3 bladed Scimitar	PL60152
M20C, D, G	3 bladed Scimitar	PL60154
M20E, F	3 bladed Scimitar	PL60149
M20J	3 bladed Scimitar	PL60136
M20K	3 bladed Scimitar	PL60199
M20R	2 bladed	M20R241-01
M20R	3 bladed	M20R418-01
M20S	2 bladed	M20S239-01

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(254) 752-8381

Engine Fax: (254) 752-3307 | Parts Fax: (254) 756-0640



Thanks for advertising Mooney 201TM. It sold.

Claude Sandy T

HI DE HO.... Terrific issue, great reading, and tremendous information....

Thank you for your effort...

Fred L

I have been running an ad in the Flyer for my KT76A transponder, but it's been sold so you can pull that ad. Thanks so much for everything you do.

Michael M

Editor Note: William, do you receive calls from potential clients as a result of your listing in TheMooneyFlyer.com?

Absolutely I do. I have 2 students with checkrides tomorrow. One is getting a private pilot tomorrow in his M20J and the second is doing his instrument in his M20R. Definitely get a lot of traffic and phone calls from your CFI listing. Thanks for offering it. It definitely helps me.

Regards, **William W**

I'm a little new to The Mooney Flyer. Can you tell me if there have been any previous articles published about IO-360 to IO-390 conversions? This doesn't seem to be a very popular conversion for Mooneys. It does seem to be fairly popular with Cardinal owners though.

Thanks, **John**

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Use promo code **SANTASALE** at checkout.

**Code can only be used for online GIFT CARDS, one time, for a single redemption.
Does not apply for phone-in orders. Offer ends 12/25/18.*



iPad Charged!



If you depend on your iPad as your main source of aviation charts and GPS navigation, you don't want the battery running out of juice before touchdown.

Generally, the battery will last about 4 to 6 hours on a full charge when using it as a GPS navigator.

We'll look at the devices you carry, ways to improve battery life, the portable backup batteries and built in USB chargers, to help you understand what you need to look for and what to avoid.

How much juice does your portable device need?

iPad Mini



Battery size 4,500 – 6,400 mAh
Needs a mere 1 amp to charge

iPads – Original to the newer Pro



iPad 1: Battery size 6,600 – 11,500 mAh
iPad Air 1 & 2: Battery size 7,300 – 8,800 mAh
iPad Pro 9.7": Battery size 7,300 mAh
iPad Pro 10.5": Battery size 8,200 mAh
iPad Pro 12.9": Battery size 10,300 mAh

All iPads require 2.1 to 2.4 amps to charge.

mAh –

means **milliamp Hour** and is a unit that measures (electric) power over time. In general, more mAh = longer battery capacity or battery life.

A higher number means that the battery can store more energy, so it has a higher capacity. This also means longer battery life for a given usage.

Mobile Phones

As a general rule of thumb, mobile phones only require **1 amp** to charge. The larger phones, like the iPhone Plus models and iPhone X, may need **2 amps** or more and vary by device.



ADS-B Receivers

If you want to charge a Stratus, you'll need at least a 2 amp charger for the best rate. In a pinch, though you can charge any of these devices with a 1 amp charger, though you'll experience a slower charging rate.

Will a 2.4 Amp Charger damage your iPhone or Mini?

You can charge a 1 amp device (like an iPhone) with a charger rated at 2 amps or higher. No need to worry, it won't cause any harm.

Built In USB Charger

When charging your iPad, no matter which model you have, make sure you have a minimum 2 amp output USB port. Less than 2 amps will be insufficient for fast charging and depending on the device, it may not charge at all. USB hubs for charging are typically 1 amp to 2.4 amps. If you have an Original to Pro iPad and a 2.0 amp USB port, it might keep your iPad at 100% for 1.5 hours, but then you'll start to see a continuous drain in battery percentage.



Portable and Cigarette Lighter Plug-In Chargers

When you're buying a backup battery or charger for the cockpit, you should consider its battery mAh rating and the output amps of the USB charging ports. Based on the iPad battery specs listed on the previous page, you should be certain that you're buying a large enough backup battery for your needs.

The [Flight Gear battery pack](#) has 20,000 mAh of battery and offers 4 USB ports: one 3 amp USB port, one 2.4 amp USB port, one 2 amp USB port and one 3 amp USB-C port. 20,000 mAh is enough juice to recharge your iPads, Stratus, and cell phones multiple times. Best of all, you can charge it with any lightning or USB-micro cable, eliminating the need to



carry another proprietary power cable.

The [Dual 2.4 USB Cigarette Lighter Charger](#) has two 2.4 amp USB charging ports and plugs into a cigarette lighter on the panel of your aircraft. The charger is compatible with 12V and 28V systems.



The [Flight Gear Dual USB Charger](#) works with 12V and 28V systems, and has dual 2.4 amp charging ports. It has a built-in screen to display system voltage or, when a USB cord is plugged in, it indicates how many amps are being used.



Dim the screen to extend battery life

Backscreen lighting can be a big power draw. Consider dimming the screen or turn on Auto-Brightness to extend battery life:

- To dim, swipe up from the bottom of any screen to open the Control Center and drag the Brightness slider to the left.
- Auto-Brightness adjusts your screen to lighting conditions automatically. To activate it, go to Settings > Display & Brightness and set Auto-Brightness to On.

Maximize iPad battery life & increase performance



Even with a high-resolution screen and a powerful processor, Apple's tablet offers a battery life of 4 to 6 (or more) hours in the air. That's better than almost every other competing tablet. This is a huge advantage in the cockpit, as it'll last for the duration of all but the longest single leg flights.

The iPad uses a LiPo (lithium-ion polymer) battery. LiPo batteries are lightweight, but have a high power density.

LiPos don't have a "memory effect" like older Nickel Cadmium batteries, so you can charge your iPad anytime you want and even leave it on a charger overnight. The battery will also charge very rapidly, to about 80% in a few hours, while the last 20% is more of a trickle charge and takes longer. LiPo batteries also hold their charge for a long time, so a fully charged iPad can sit idle for a month and still have most of its charge.

Charge Cycle – Battery Lifespan

Apple specifies a “battery lifespan,” which is the number of times you can charge and discharge the battery before it starts to lose capacity. The iPad was designed so that, after 1,000 charge/discharge cycles, it will still have 80% of its battery capacity. However, it’s not considered a “charge cycle” every time you plug in your iPad. If you used 20% of your iPad’s battery life every day for 5 days, and recharged it each day to 100%, that would equal one charge cycle. In this case, 1,000 charge cycles would be 5,000 charges.

iPad Travel Tips



Charging your device while enclosed in a protective case can generate extra heat, which may affect battery capacity. If you notice that your device gets hot when you charge it, take it out of its case first. Your device has an ideal comfort zone of 62° to 72° F (16° to 22° C).

Temperatures higher than 95°F can permanently reduce battery life. That means that your battery will not longer power your device as long on a given charge. When parked

on the ramp, cockpit temps can reach 95°F or more; triple digits in Thermal, CA or anywhere in southern Arizona. Never leave your iPad in the airplane and never place it in the sun. Charging the device when it’s over 95°F is hard on your iPad. Try to do your charging at home if you often fly in hot conditions. Finally, airflow does help, so remove your iPad from its case if it’s getting hot.



Cold conditions (below 32° F) can affect battery performance. However, this is a temporary issue. Don’t store your iPad in the airplane on a cold night. However, if you do leave it in the cold, once it warms up, the battery should regain normal life – it’s not damaged.

Use your iPad regularly. Lithium-ion batteries are meant to be “rode hard and put up wet”, so don’t be afraid to use and recharge your iPad often. In fact, if you don’t regularly use your iPad, you should perform a complete charge cycle at least once a month. What’s that? It’s where you fully discharge the battery, then charge it up to 100%.

Use the latest iOS Version. After your app developer, (ForeFlight, FlyQ, etc.), checks out the new iOS version and gives you the “all clear”, you should update your iPad to the latest version of iOS. Apple often includes fixes and performance enhancements for the battery to their iOS updates.

Adjust screen brightness for maximum battery life. If you don’t need the screen at max brightness, turn it down—this can significantly reduce battery drain. In iOS 11 and later, you can turn auto-brightness on or off in Settings > General > Accessibility > Display Accommodations.

When you don't need Cellular Data, turn it OFF

There are times when you need Cellular Data, such as when you want to file a flight plan and activate it using your iPad and aviation app. After you've taken off and activated your VFR Flight plan, turn off the Cellular Data, especially when you're using a Bluetooth or WiFi accessory like an ADS-B Receiver.

This will:

- Increase and maximize battery life
- Reduce the potential for interference with the panel-mounted avionics.

Recommended Wireless Settings for iPad and Accessory Combinations

iPad with plug-in Bad Elf GPS



- 1.) Airplane Mode
 ON
(Disables all wireless radios)

iPad with WiFi Receivers, such as Stratus ADS-B



- 1.) Airplane Mode
 ON
THEN
2.) Wi-Fi
 ON
Back to ON

iPad with Bluetooth receivers, such as Garmin GLO, Garmin GDL 50/ 51/52, Dual XGPS or Bad Elf Bluetooth GPS



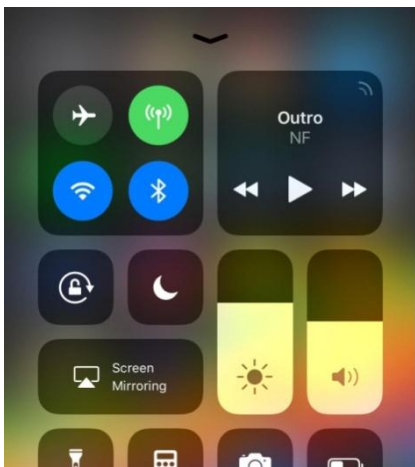
- 1.) Airplane Mode
 ON
THEN
2.) Bluetooth
 ON
Back to ON

Cellular iPad with Internal GPS Receiver



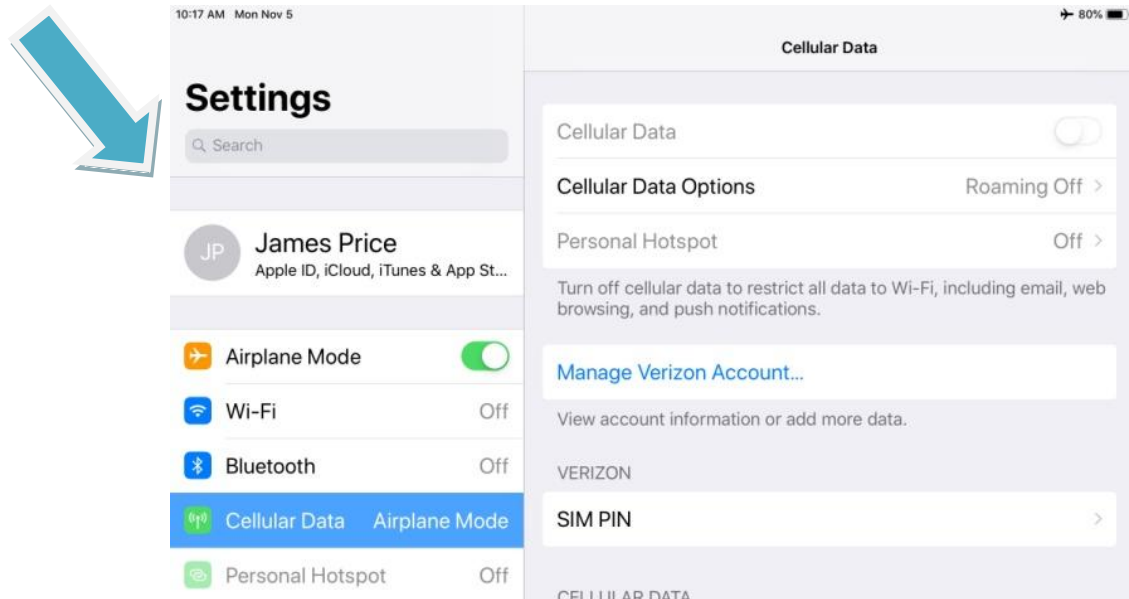
- 1.) Airplane Mode
 ON

After the iOS 11 update in 2017, turning off Wi-Fi or Bluetooth using the control center shortcut doesn't actually disable those radios when you turn off the switch.



The Control Center Shortcut, (shown to the left), only disconnects a Bluetooth or WiFi device, while keeping the radios active.

Because of this, you should first configure the Airplane Mode to “ON” and then return either the Wi-Fi or Bluetooth to “ON” using **the main iPad Settings**.



Use the Battery Utility in the Settings app to monitor which apps are using battery life

iOS actually shuts down background apps before they become real parasites, but it's worth looking at this once in a while.

The iPad and the many wonderful aviation apps combined with ADS-B receivers like Appareo's Stratus, have revolutionized the way we fly and receive information in flight. Take care of your iPad and you'll be a happy pilot.

Fly Safe.

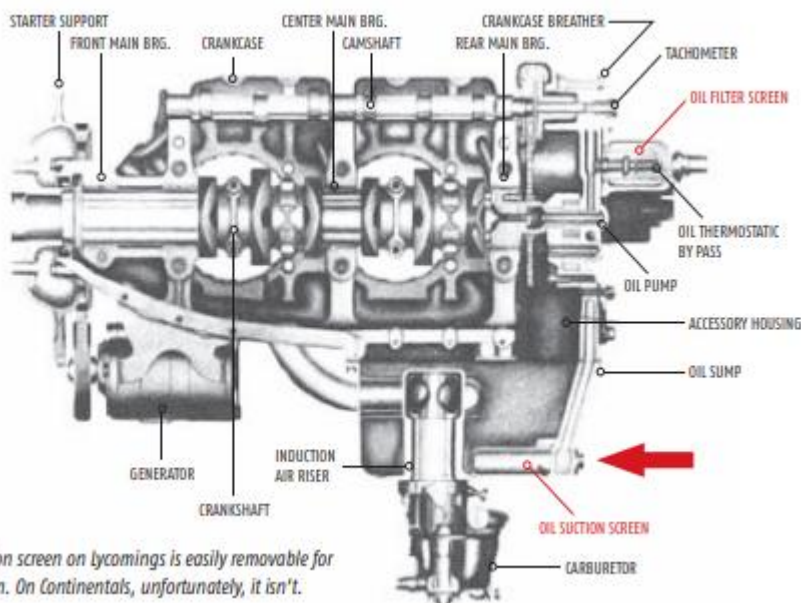
Jim

PHIL CORMAN



Metal in Your Oil

Most of us think that all we need to do is cut the filter at every oil change to check to see if our engines are making metal. Nothing could be further from the truth. There are three places in your engine that metal is “captured”.



The suction screen on Lycomings is easily removable for inspection. On Continentals, unfortunately, it isn't.

The first place is in the “Suction Screen” that sits close to your oil pan. This catches the relatively large pieces of metal (.03” or larger) and prevents it from traveling any further into your engine.

These pieces are caught by the screen, which is good, but there is a problem for the owner. Unless you check the oil while draining it through a filter such as chamois cloth, you will never see these large pieces which are huge warning signs that you have a

significant issue in your engine. Lycoming actually has an access point to check the suction screen, but apparently most mechanics don't know to check it. Continental has no such access, so your only recourse is to strain your oil as it drains.

The second place is the “Oil Filter”. This one is easy to check and can be done by cutting the filter open at each oil change. The oil filter captures the smaller pieces of metal that slip through the suction screen. Pieces will typically be less than 1/16” in size. You can check for iron with a magnet applied to the pieces. If the pieces are not magnetic, then it's aluminum, chromium, nickel etc.



How much metal is too much in the oil filter, you ask? After watching a Mike Busch webinar, I learned that Lycoming

actually gives us guidance ([Service Instruction 1492D](#)) on how much metal in the filter is “too much” Continental gives no such guidance, so it makes sense to utilize Lycoming’s.

- If the filter contains one to nine small pieces of metal (1/16-inch diameter or less), change the oil and filter, then inspect the filter at the next regularly scheduled oil change.
- If the filter contains 10 to 20 small pieces of metal (1/16-inch diameter or less), change the oil and filter, then inspect the filter after 25 hours.
- If the filter contains 20 to 40 small pieces of metal (1/16-inch diameter or less), change the oil and filter, then inspect the filter after 10 hours.
- If the filter contains a larger quantity of small pieces of metal (1/16-inch diameter or less)—such as 45-60—change the oil and filter, run the engine on the ground for 20-30 minutes, then inspect the filter and suction screen. If they are clean, fly the aircraft for one to two hours and then inspect again. If still clean, inspect again after 10 hours.
- If the filter or suction screen contain large pieces of metal the size of a broken lead pencil point or larger (1/16-inch diameter) totaling 1/4 teaspoon or more, ground the engine until the source of the metal can be determined.
- If metal is found in the amount of 1/2 teaspoon or more, remove the engine and perform a teardown inspection.

The 3rd place to find metal in your oil is suspended in the oil itself.

These are the tiniest pieces of metal (.001” or smaller) that slip through the oil filter and remain, for the most part, suspended in your oil. In many cases, these are trace amounts. The only way to get a read on these tiny pieces is via “regular” oil analysis. We prefer [Blackstone Labs](#). Oil analysis provides the best information about the metal and other stuff in your engine as trends over time. Silicon, which is dirt, is bad, but sometimes it gets into your engine. It’s only really bad if it



OIL REPORT

LAB NUMBER: F52443
REPORT DATE: 5/2/2018
CODE: 6375

UNIT ID:
CLIENT ID:
PAYMENT: CC Discover

UNIT	MAKE/MODEL: Continental TSIO-520-EB FUEL TYPE: Gasoline (Leaded) ADDITIONAL INFO: Cessna T310R, 5 Superior Cyls	OIL TYPE & GRADE: Phillips XC (AVC) 20W/50 OIL USE INTERVAL: 34 Hours
CLIENT	When he received the report with nickel up to 86 ppm, the owner of this Cessna did a borescope test and discovered three burned exhaust valves. The cam and lifters were okay. He overhauled those cylinders and wear returned to normal in the following months.	
COMMENTS	We are concerned that the higher chrome and nickel may indicate an exhaust valve guide problem developing. Both elements have been on a pretty significant up-trend since May of 2017 and we don't see a good reason why. We also found higher chrome and nickel in the right engine, though those levels were nowhere near these. Fuel and insolubles could be related to the excess wear. Check the oil filter for metal and any other signs of a valve guide problem, like a bad mag check. Monitor for problems related to excess heat, and run a borescope inspection/compression test.	

ELEMENTS IN PARTS PER MILLION	UNIT / LOCATION	AVERAGES	31	43	35	35	45	UNIVERSAL AVERAGES
			2/12/2018	12/23/2017	7/30/2017	5/26/2017	3/6/2017	
MILHR on Oil	34							
MILHR on Unit	1.428		1.394	1.363	1.321	1.277	1.242	
Sample Date	4/24/2018							
Make Up Oil Added	1 qt				1 qt	0 qts	4 qts	
ALUMINUM	5	11	5	6	7	4	7	10
CHROMIUM	27	12	20	18	14	7	16	9
IRON	57	48	42	50	43	26	58	41
COPPER	8	7	5	5	5	3	7	5
LEAD	6431	6005	7061	8303	8578	4506	7864	5030
TIN	2	2	2	0	3	1	4	1
MOLYBDENUM	8	6	18	64	3	2	4	4
NICKEL	86	36	67	62	46	24	54	23
MANAGANESE	1	1	1	1	1	0	1	1
SILVER	0	0	0	0	0	0	0	0
TITANIUM	3	1	2	2	1	1	1	1
POTASSIUM	1	1	1	0	5	4	0	1
BORON	0	1	2	3	1	0	1	1
SILICON	9	12	7	11	7	4	5	9
SODIUM	3	2	2	4	1	1	3	1
CALCIUM	91	91	86	92	88	70	95	35
MAGNESIUM	1	1	1	1	1	0	5	1
PHOSPHORUS	208	293	189	44	245	247	308	343
ZINC	3	4	4	3	5	4	5	4
BARIUM	0	0	0	0	0	0	0	0

PROPERTIES	Values Should Be*							
	SUS Viscosity @ 210"	05.5	06-105	05.0	03.0	07.3	04.9	05.5
	cSt Viscosity @ 100°C	16.89	17.0-21.8	16.76	16.26	17.32	16.73	16.89
	Flashpoint in °F	420	>430	445	445	440	480	425
	Fuel %	0.5	<1.0	<0.5	<0.5	<0.5	<0.5	TR
	Antifreeze %	-	-	-	-	-	-	-
	Water %	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Insolubles %	0.7	<0.6	0.6	0.5	0.4	0.5	0.4
	TBN							
	TAN							
ISO Code								

* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

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LIABILITY LIMITED TO COST OF ANALYSIS

persists or gets worse. It's pretty much the same with all the other stuff in your engine oil. BlackStone gives you your trends as well as "averages" for your engine.

Summary

The purpose of this article is to make you more aware of the places in your engine that capture "stuff" floating around in your oil, such as metals, silicon, lead, etc. Most of us never check for the largest pieces that are found at the bottom of the crankcase/oil pan. Ironically, these are the most distressing signals of something big about to happen. Checking these big pieces via the Lycoming access or straining your oil as you drain it from your Continental will show you these big pieces. The oil filter will capture the rest and you can find those pieces by cutting the filter. The smallest pieces that will show trends in your metal production can only be determined by regular oil analysis. You need to do two to three analyses before you will get real trends and valuable information on the state of your engine parts.

Regular oil and oil filter changes are pretty much the cheapest thing you can do for the health and well being of your engine.

Things to remember about your engine and oil:

- Don't hand prop your engine, thinking that it will lubricate your engine. It doesn't. In fact, when you hand prop, oil is NOT pumping to the top of your engine, so you are simply grinding parts, since.
- Fast taxiing in lieu of an actual flight does very little for your engine. Water and oxidation/rust are your enemies. You must take your Mooney aloft, and for about one hour at normal oil temperature, in order to boil off the water/condensate in your engine. Note: Camguard helps reduce oxidation when your engine is sitting in the hangar or on the ramp for up to 500 hours.
- Only start your engine when you have to do so. The most wear takes place in the first 15 – 20 seconds after an engine start. It gets even worse if the ambient temperatures are below 32°F/0°C, unless you preheat your oil and cylinders.
- Change your oil no less often than every 35 hours/three months. And for goodness sakes, change the filter, too.





Death Valley via Mooney

by Linda German

Flying through desert mountains, that look so inhospitable, then turning the corner and seeing Death Valley spread out in front of you, you wonder how the early pioneers could not think they had entered the most barren place on earth. This was our third trip to Death Valley and this time it was with another aviation couple. Our friends called one day and casually asked if we would like to fly to Death Valley for a couple of days. Well, of course we would! This time we would be going in Autumn. We arrived early in the morning and the weather was ideal; cool and clear with no winds. We arrived before our friends, of course, as we were flying a Mooney. We touched down right at the beginning of the runway. I have to say the runway needs a little help because when we touched down, there were a lot of bumps. It was the runway, not our landing performance! We taxied to the ramp and wondered where to park as there were few markers to indicate parking spaces. With the help of a couple of Park Rangers, who happened to be there, we were directed to the best place to leave our Mooney. We unloaded our backpacks, buttoned up the Eagle and waited for our friends to arrive. Within a short time, we spotted them flying up the valley. The Rangers had indicated that our Jeep was parked next to the ramp with the keys inside, so we loaded up and headed to the rental office. We completed the paperwork and took a cooler full of ice and water and headed out to Titus Canyon.

On our way to Titus Canyon, we stopped at a ghost town called [Rhyolite](#) with a couple of semi standing buildings and one house. The house was the most interesting as the walls were made from glass bottles cemented together. The floors and roof were wood. I don't know if the glass bottles made better insulation from the heat or if they were just interesting. From the brochures, we learned the boom time for this town only lasted one year, then the lead was mined out. After exploring the glass bottle house, we went across the street to what looked like an outdoor art



museum. There were some odd ghost like statues and a bench made of cement and glass pieces.

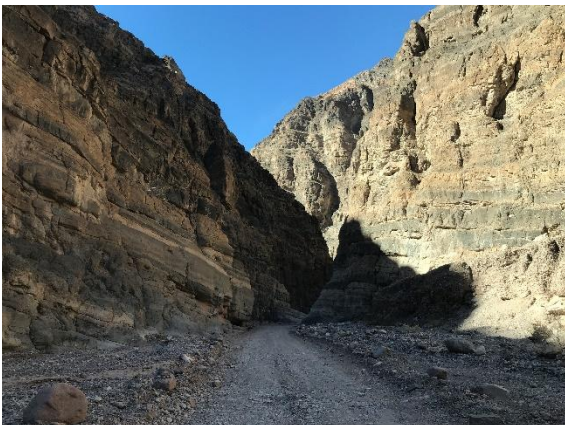
Now we were ready to go to [Titus Canyon](#). If anyone wants to try driving this canyon, we recommend you take a four wheel drive vehicle, as the road is gravel and very primitive. We had our trusty Jeep, so we were ready to hit the road. Titus



Canyon is a deep, narrow gorge cut into the steep face of the Grapevine mountains in the Mojave desert. The trip lasted approximately three hours and the gorge was well worth the experience. The canyon had it all: Rugged mountains, colorful rock formations, many abandoned mines, a ghost town and petroglyphs. Of

course, there were numerous, long abandoned mine entrances that the guys had to explore. We saw many different vistas as

we traveled through the canyon. At the beginning, we saw open spaces, then moved on to more mountainous regions, then near the end of the canyon, in some places, the walls start to squeeze down to less than 20 feet apart. As a side note, Native Americans came to the Klare Spring to hunt Big Horn Sheep and left behind petroglyphs, pecked into the rocks.



After coming out of Titus Canyon, we drove to [Stovepipe Wells](#) and Mesquite Flat Sand Dunes. We were originally going to Scotty's Castle, but it was closed for renovation. We stopped for lunch at Stovepipe Wells and were surprised to see a newer market and nice looking hotel. The lunch at the restaurant was okay, but not the highlight of our trip. After lunch, we went back to Mesquite Flat Dunes and walked around on some of the tallest dunes in North America; some were 100 feet tall.

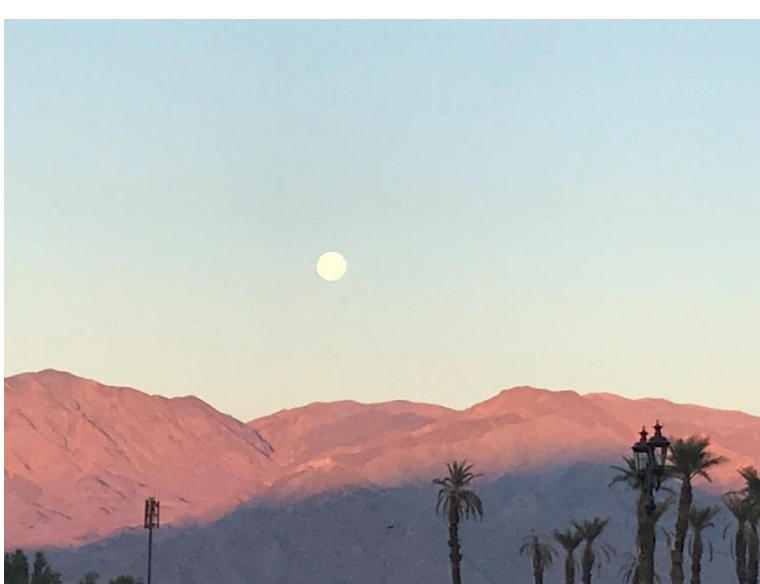
We drove back to Furnace Creek Resort and discovered that they were in the middle of a \$50 million renovation. The resort has a new look and a new name. It is now called Oasis at Death Valley. The Furnace Creek Ranch is also being remodeled with a new restaurant and a market. The rooms are not yet upgraded, but the entrance has new palm trees and the buildings are all new. The outdoor museum is still there with the 20 mule team wagons and the old mining equipment. The spring fed swimming pool is also still there, as well as RV parking, golf courses and campgrounds.

After checking into our rooms and taking a short rest, we headed out for [Zabriskie Point](#), a few short miles away from the Oasis Resort and Furnace Creek Ranch. This is a must see at sunset. The parking lot is

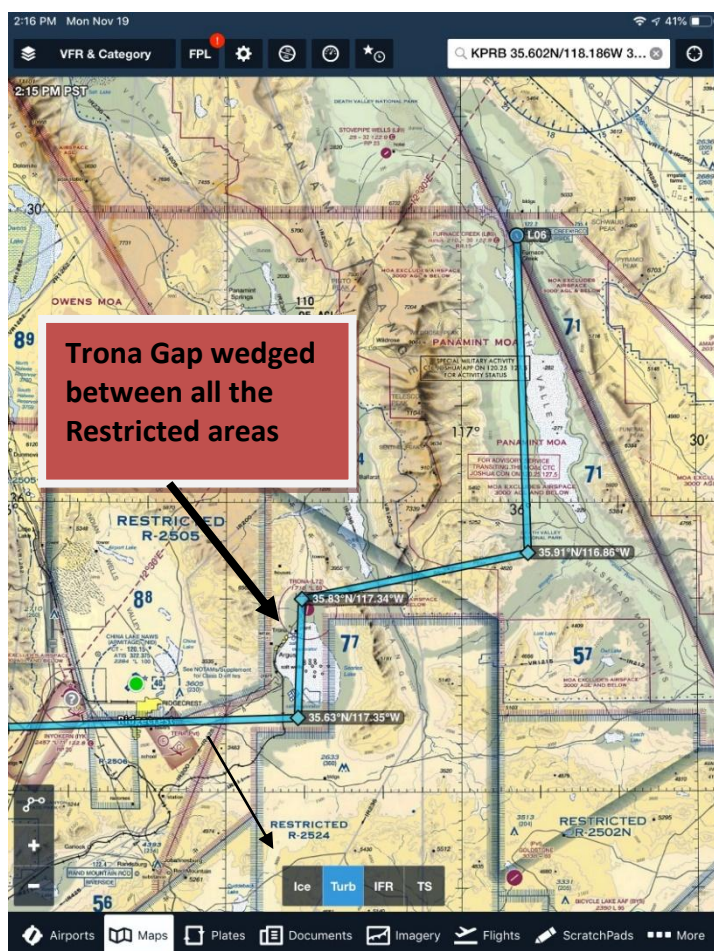


Paved, as are the short walking paths to the rim of the canyon. The sky colors were awesome as the sun set over the distant mountains. We met a few people from European countries that were amazed at the scenery and the idea of being near the lowest point, as well as the hottest and driest national park in North America.

The next day we were ready to leave and decided to walk to the airport, as it was so close. The morning was wonderful again; cool, calm and clear. The moon, setting among the palm trees and balanced on the mountains across the valley, was beautiful. We loaded ourselves into the Mooney and took off on the bumpy runway and winged our way back home, knowing we would be back to see the Ranch as a finished product someday.



Flying There



There are two airports that are conveniently located in Death Valley: Furnace Creek (L06) and Stovepipe Wells (L09). Of the two, Furnace Creek is more convenient for us.

We flew in from the west and shot the Trona Gap to avoid all of the Restricted Airspace. In both directions, we were cleared through the Restricted Airspaces at 9,500 & 10,500 MSL. We did not have to make the Trona Gap 90° turns, (not a problem). As we made the turn in the Trona Gap, heading East to North, we flew over the [Trona Pinnacles](#), which are not well known, but look awesome from 9500' MSL. We plan to visit these on another trip.

Flying at 9,500' gave us the perfect blend of spectacular views, and a safe altitude in case of an emergency. We flew in the morning so the visibility was unlimited and the air – smooth as silk. Once we turned North, we started our descent over some amazing terrain. Death Valley definitely lives up to its name.



As you descend, you'll pass Bad Water, which is the lowest point in the United States (minus 282' MSL). While approaching [LO6](#), you should look for an indication of the wind direction, like blowing dust. Or, you can overfly and observe the windsocks.

The runway is 3,065', but it's not in the best condition. Plan a soft field landing, keeping the nose off the runway. Although not necessary, it's easier on the gear and your passengers. There is no taxiway, and the turnoff is to the East, near the North end of Runway 15-33.

To avoid helicopter rotorwash on your Mooney, we recommend that you park away from the South end of the ramp. There are no tie downs, so bring your own chocks. If you are concerned and have your own tiedown straps, there are some rings toward the southern portion of the ramp.

There is a FREE shuttle between the airport and the hotels, whether you are staying at the [The Inn at Death Valley](#) or the [The Oasis at Death Valley](#) (which is a short walk from the airport and less expensive).





Mooney Tunes

Jim Price

Traffic Calls

When tower or center tells you about other traffic and you do not see the traffic, what is the best response?
What is the best response when you spot the traffic?
What does ATC want to hear?

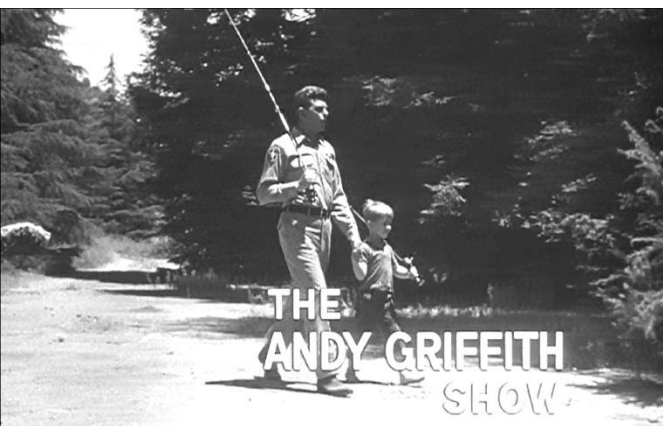
The AIM Pilot Controller Glossary recommends two phrases:

Traffic in Sight – used by pilots to inform a controller that previously issued traffic is in sight.

Negative Contact – used by pilots to inform ATC that previously issued traffic is not in sight. It may be followed by the pilot's request for the controller to provide assistance in avoiding the traffic.

It can help the controller and other aircraft if when you report the traffic, you also specify the type of aircraft. For example, if you say, "Twin Cessna in sight", and the controller is pointing out a single engine, it lets him or her know that you are not looking at the correct aircraft.

That's nice, but . . .



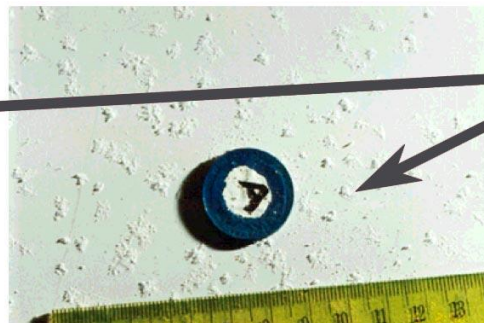
Including the phrases "I have him on TCAS", or "I have him on TIS", doesn't really help the controller, other than letting him or her know that you are looking for the traffic. Using the phrase, "Got him on the fish finder", can indicate that you're either a fishing fanatic or Gomer's cousin. When you have Electronic contact, this does not relieve the controller of the requirement to have you establish **visual contact**.



Would You Like Some Ice with That?

by Phil Corman

Winter is coming and with it, comes the ice. Ice is the visible killer and to ignore it isn't very good. The only way to safely avoid it, besides staying on the ground, is to fly in VFR conditions or outside of clouds. However, there are other places you can accumulate ice. In the winter, if you're parked on the ramp, you will find frost on your plane almost every morning. Most folks will not depart with too much frost or ice on their wing. But did you know that only a small bit of frost can eliminate enough lift to prevent a successful departure? As little as one grain of frost in .4 sq. inches can ruin your departure. Don't let it. Clear the frost.



Small, almost imperceptible frost accumulation

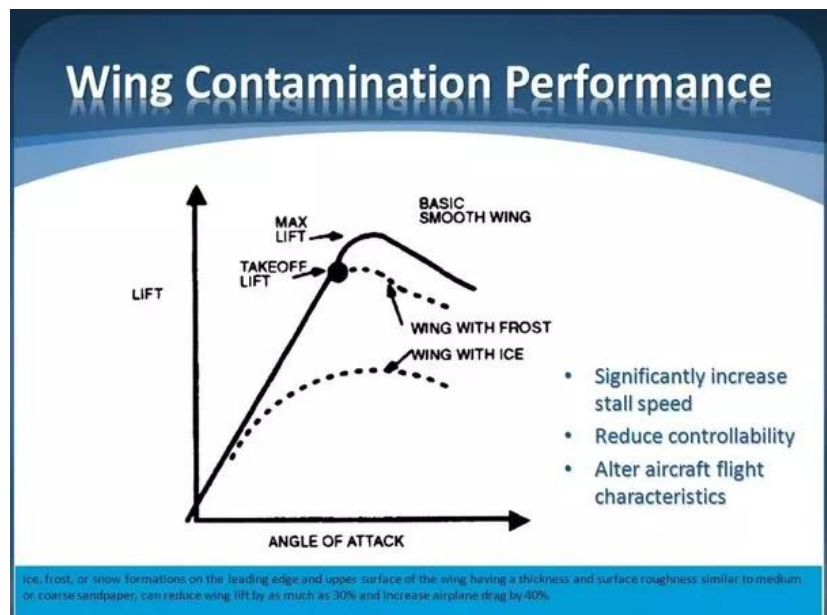
Frost can also reduce the max lift on our wings by up to 30%. Our Mooney wings are Laminar, so that could impact us more significantly.

We are all aware of the Critical Angle of Attack. But did you know, that frost can reduce your critical angle of attack by more than a few degrees?

And because it messes with the otherwise, smooth flow of air over our wing, it can increase drag by as much as 40%.

According to the FAA, almost every accident attributed to frost could have been avoided by removing the frost before the flight. Geez, I hope we get the message.

Fly Fast, Fly Safe!





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

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



The Mooney Maintenance Puzzle



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Search Mooney's
 Service area for
 Service Bulletins (SBs)
 and Service
 Instructions (SIs)
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Search the FAA
 database for Air
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 (ADs) applicable to
 your model



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 Directive (AD) Log – all
 models



Gifts for Good Mooniacs

Front and Back Seat USB Charger

\$39.99, Sporty's



Cleverly designed with a 2-port plug, 3-port backseat hub, and 6ft extension cable. Now, everyone in the aircraft, from the front seats to the back row, can have rapid charging power within easy reach, no matter where they sit. While every port is engineered to **deliver a 2.4A maximum output** to any USB device, the plug and hub each have one port that's enhanced even further with Adaptive Fast Charge Technology. These 2 orange ports can simultaneously power up two compatible Fast Charge devices from drained to 50% full in just 30 minutes.



Lightspeed Zulu

\$850.00, Amazon



ACR ResQLink PLB

US address required for registration. \$289.95, Sporty's



Bose A20 \$1,095, Amazon

Give the Gift of ForeFlight to the Pilot in Your Life

Available in \$300, \$200, or \$100 denominations, ForeFlight



AN-J-3 Leather Flight Jacket

Price: \$325, Sporty's





GoPro Hero 7 Black \$399.99, Sporty's

The HERO7 Black is the most advanced GoPro ever. With hyper smooth stabilization, you'll get gimbal-like video without the oversized gimbal. The new intelligent photo mode delivers the best, most brilliant images automatically. And now with live streaming and the GoPro app, you can share every amazing moment as you live it.

Flight Outfitters Centerline Backpack \$99.95, Flight Outfitters



Pilot BluLink (twin plugs for GA) \$249.00, Sporty's

BluLink enables you to use your Bluetooth cell phone and any music source wirelessly in the cockpit. You can use your existing general aviation, helicopter or BOSE panel mount aviation headset with BluLink. No more tucking your cell phone

under your headset or using cell phone adapters with various cords and additional adapters. The BluLink will work with any cell phone with Bluetooth.

The BluLink is great for filing a flight plan, checking weather, calling for fuel, getting a clearance at an uncontrolled field, or calling for a taxi.





Custom Tail Number Replica Sign

\$209.95, Sporty's

For pilots who seriously miss every moment they're separated from their airplane, Sporty's will create a metal replica that looks like it was cut right off the rear fuselage of an airplane itself, right down to the rivets and the curve of the tin. All that's needed are a couple of high-quality photos of your actual

aircraft, and the Sporty's folks will work their magic. delivery.

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Avionics Repair and Installation Services now available on site thru J&R Electronics

NATIONS TREMBLE BEFORE IT....MILLIONS FLEE ITS APPROACH....

I Fly a Mooney

FEAR ME

4 Seats, 9 gph, 175 mph of screaming terror!



2,422 M20Cs were manufactured from 1962 – 1978

The C has 4 cylinders that produce 180 HP and an average TAS of 140 – 145 knots

CLICK HERE to view the M20Cs for sale at Aircraft Shopper Online (www.aso.com)

High asking price: \$75,500 (1968 / 0 TSOH / Unknown TTAF)

Low asking price: \$28,000 (1965 / 1,275 TSOH / Unknown TTAF)

Average asking price: \$45,850

6 Month average asking price trend (\$)





Ask the Top Gun

Tom Rouch

Founder of Top Gun Aviation, Stockton, CA

Send your questions for Tom to TheMooneyFlyer@gmail.com

Question: McCauley recommends that their props be overhauled every 2,000 hours or 6 years. Can I get by with just an inspection and repair as necessary? Tell me all about it, Tom. What do you recommend?

What about Hartzell props?

Answer: If you are operating under Part 91 and do not fly for hire, the requirements for overhaul of anything is not required. This applies to any prop, engine, etc. Through the years, I have had many customers, extend the life of overhaul type items. Most of the time, it's to bypass the calendar part of the requirement. This is especially true for props. They have a 6 year overhaul requirement, even though a prop may only have a few hundred hours at the six year mark.

Everything depends on the condition, of course. Many times I have recommended that the prop be resealed, which would automatically require some inspection. Since leaking props are the most common problem, this also serves another purpose in extending the life of a prop.

If you have had the prop "balanced", then be sure you mark the prop and crank some way, so you can re-install the prop, indexed as it was before removal.

Using this method can be cost effective, while maintaining the safety of the prop. So many

Mooneys have "hot" props and an overhaul requires that the prop boots be replaced (a costly item in itself).

This also applies to engines, but a more thorough analysis of the history of the engine is required in my opinion. There is also a "yearly" overhaul requirement for engines, when used for other than Part 91.

Hope this provided some clarity.



Spatial Interior for your vintage Mooney

SI

Simple, quick and effective repair methods add new life to cracked and discolored plastics. Optional STC approved lower side panels add space and elegance. Installed without screws will please any mechanic.

For details, visit:

www.jaegeraviation.com

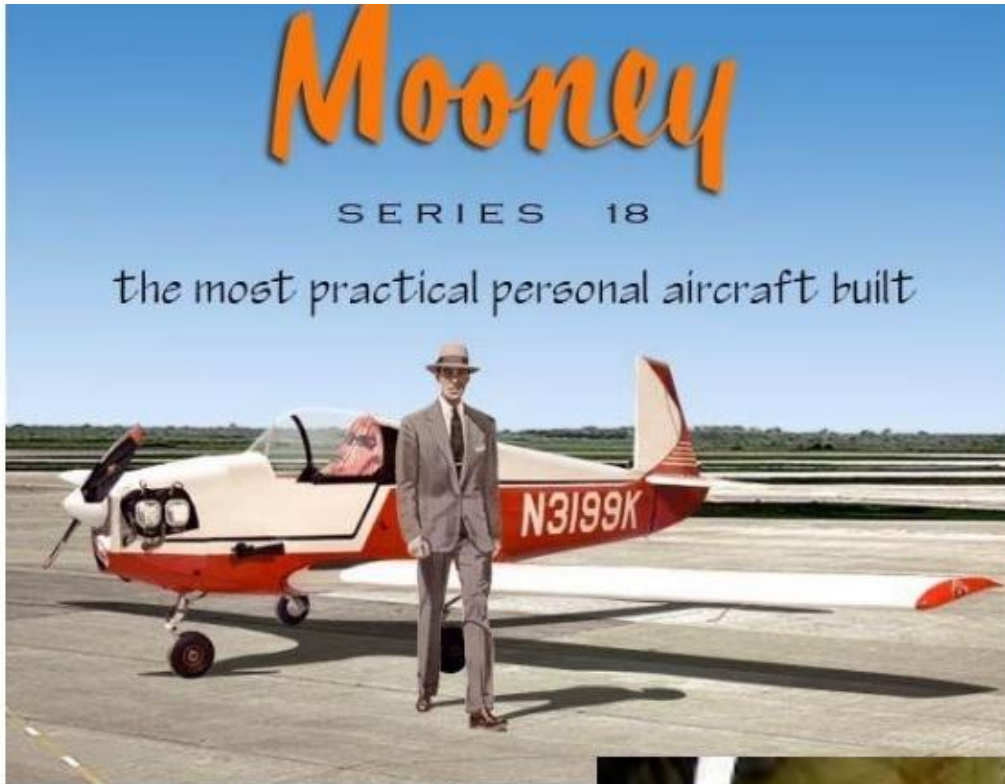


Jaeger Aviation

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320-444-3042







4 and 8 Man Aviation First Aid Kits \$30 - \$40

Far better than cheap drugstore kits, these contain the specific supplies required to treat the types of injuries sustained in an aviation accident. Keep one on board your airplane at all times so you're prepared for the worst.

Shop [HERE](#) (Sporty's)



Light Hawk – Flying for Wildlife Conservation

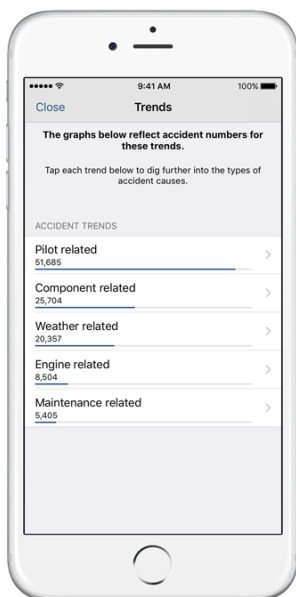
A new PBS documentary features [LightHawk](#), a non-profit organization that uses volunteer pilots and their airplanes to help protect the environment by taking photographs, collecting data, and influencing decision makers about the environment's most critical issues.



The almost hour-long documentary, "LightHawk: Destination Conservation," is from the New Hampshire PBS station. You can watch the full episode [here](#). It contains very interesting information. For instance, when a bullet kills an animal, the lead leaches into the carcass. The California Condors eat these carcasses, and eventually, many of the Condors develop lead poisoning.

You can watch a 30 second promo for the show [here](#).

If you want to be a volunteer pilot, click [here](#).



Flight Chain App: NTSB accident trends

The [Flight Chain App](#), is a mobile app that helps pilots learn from accident chains by looking at [NTSB](#) accident reports and “Trends”.

Pilots can see aviation accident trends to view the causes of accidents that occur most often. This helps enhance situational awareness, and helps pilots recognize and break a potential accident chain in their own flying. The hope is that pilots who regularly read [accident reports](#) will tend to be safer pilots.

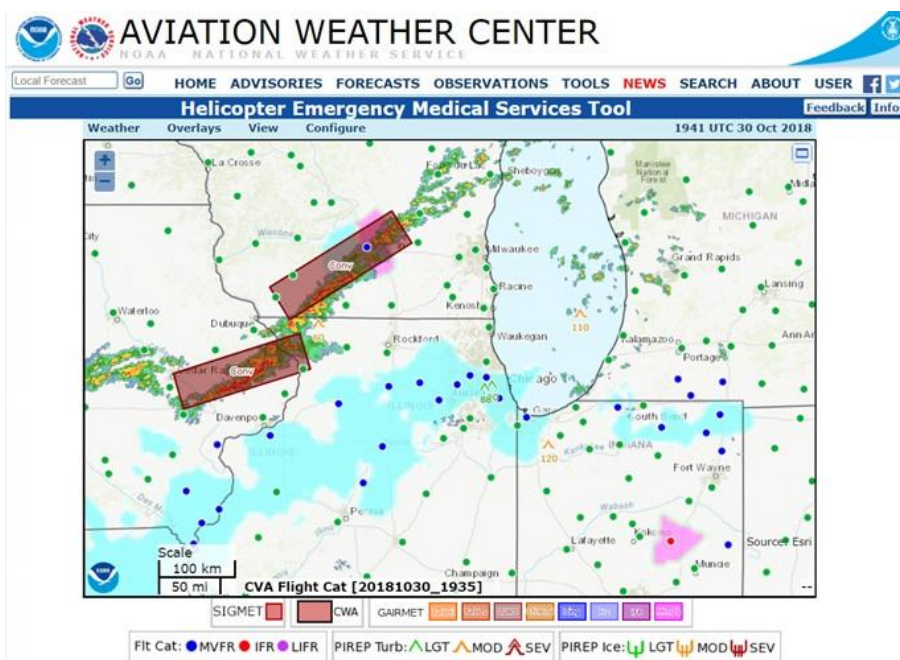
The Best Weather Tool You’ve Never Heard Of

If you are a general aviation pilot who spends most of your flying time on short flights below 5,000 feet agl, there’s a weather-data source designed just for you—and there’s a 97-percent chance you don’t know it exists.

HEMS stands for Helicopter Emergency Medical Services. If you put aside the misnomer and find your way to the [HEMS page](#) on the Aviation Weather Service website, you’ll “love it.”

Checking the HEMS Tool during your flight planning will make you a safer, more weather-savvy pilot, they say, because the tool was designed in 2006 to increase pilots’ situational awareness down low, thereby reducing loss-of-control accidents and controlled flight into terrain.

The tool’s capacity to fill in the gaps makes it popular with helicopter air ambulance pilots, who may have to make the call about launching on a flight to an off-airport destination on extremely short notice.



When used in combination with the sources of weather information most pilots are familiar with, the HEMS Tool can be “our no-go decision maker.”

It’s a supplemental product, so it doesn’t replace traditional briefings. That’s where it shows its strength, providing a customized presentation that lets a user overlay a variety of weather information on the display, and add or remove displayed data such as airports, boundaries, roads, NAVAIDs, and more. There is also a button that users can click to provide feedback to the AWC.

Let FltPlan Help You Comply with Mexican APIS



As you may know, Mexico requires pilots to submit electronic Advanced Passenger Information (APIS) to the Mexican government before every flight entering or exiting Mexico. FltPlan’s Mexican APIS service can help you comply.

With this add-on to FltPlan’s U.S. eAPIS service, they will submit your Mexican APIS electronically and provide you with a special call-in phone number. This way you can comply with Mexican requirements for sending your electronic APIS manifest after you are strapped in. Other companies require the pilot to make this last-minute submission manually from a website.

Fines from the Mexican government for not submitting your manifest can be as much as \$5,000 (U.S. dollars).

FltPlan was the first organization to be certified by U.S. Customs and Border Protection for their successful U.S. eAPIS service, and they are also an approved provider of APIS data to the Mexican government.

If you are flying to or from Mexico, avoid a \$5,000 fine. Contact FltPlan’s Premium Services office at 1-731-855-8000 to enroll in their Mexican APIS program.

FltPlan’s U.S. eAPIS service is \$249 per year.

APIS for Mexico and the Caribbean is an additional **\$200** per year. (**Plus \$20 per Mexican manifest submission**).

Canadian API – one-time fee of **\$100**.

Storage Step Stool Doubles as a Portable Tool Kit



The new [WORX Storage Step Stool](https://www.worx.com) is a portable tool box that doubles as a step stool. It provides a 13" lift wherever it's needed, without having to grab a ladder or larger step stool. It has a storage capacity of 28 pounds, so you can load the most frequently used tools and accessories for the job at hand. Inside the WORX Storage Step Stool there's a deep cavity of built-in storage. Beneath this storage bin is a shallow, pullout

drawer for storing frequently used tools and parts.

Priced at \$39.99, The WORX Storage Step Stool is available at [worx.com](https://www.worx.com).



Sunset to sunrise, your position lights need to be on, and, if you have them, turn on your anti-collision lights.

The end of evening civil twilight to the beginning of morning civil twilight, you can log night flight time, and your aircraft needs to be night equipped

1 hour after sunset ending 1 hour before sunrise, you need to be night landing current to carry passengers



	<p>Contact Dave at daveanruth@aol.com or (352) 343-3196, before coming to the restaurant, so we can have an accurate count</p> <p>December 8, 2018: Punta Gorda (PGD)</p> <p>January 12, 2019: Leesburg (LEE) - EAA Chapter 534 will cook us hamburgers and hot dogs in their hanger, then after lunch we will car pool to our house to see Ruth's Garden Railroad.</p> <p>February 9: Fort Pierce (FPR) Tiki Restaurant</p>
	<p>January 31-February 3: Yuma, AZ – Formation Clinic</p> <p>July 20, 2019: AirVenture Caravan (KMSN)</p>
	<p>April 5-7: Santa Maria, CA</p> <p>June 7-11: Oklahoma City, OK</p> <p>September 6-8: Atlantic City, NJ (Tentative)</p> <p>October 4-6: Ogden, UT</p>
 <p>Mooney Summit</p>	<p>September 27-29, 2019: Mooney Summit VII, Panama City</p> <p>www.mooneysummit.com</p>
	<p>March 28-April 1, 2019: 2019 AGM in Ararat, Victoria, Australia</p>
 <p>European Mooney Pilots & Owners Association</p>	<p>November 30-December 2, 2018: Christmas Fly Out – CLICK HERE for details</p>
<p>Other Mooney Fly-Ins</p>	<p>June 7-9: Walla Walla, WA (ALW) – Wine, Parties, Hangin' Out</p> <p>Contact: Henry Hochberg at aerocadoc@comcast.net</p>

EMPOA Newsletter

EMPOA AGM Aschaffenburg 14JUN2018 Report



Date: June 14, 2018, **Location:** Hotel Goldener Ochsen, Aschaffenburg

The AGM was opened by EMPOA's President David Kromka at 7:05 PM. At the beginning there was a short introduction of all members present.

David Kromka: Gave a short overview of the development of the membership base. In total there are 285 members at EMPOA to this date. They are 80% from Germany, 10% from France, 5% from Austria and Switzerland and 5% from other European countries. There was a notable influx of new members from Austria and Switzerland. Sergio Petrig was introduced as our new representative for Switzerland. Overall, there were 30 new members joining the club last year; five have left the association. David Kromka also gave a brief review of past events.

Lothar Lucks: Gave an extensive overview on the club's finances. The club presently has 56 000 € in the bank with an overall positive result of 14 000 € last year.

Rolf Bienert, Werner Wohlfahrt: Performed the checks on the treasury and concluded that Lothar Lucks had done an immaculate and outstanding job as treasurer.

Philippe Coffinet: Held a speech as vice-president of EMPOA and specially focused on French-German relations within the club.

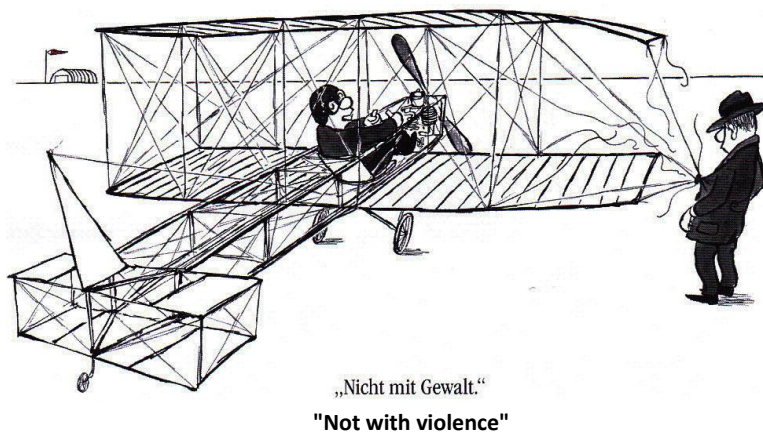
Lukas Straubinger: Gave an overview of investments that had recently been done at the club. They consist of two seawater proof boxes that complement our sea-survival rafts. They are equipped with special sea-survival equipment (VHF handheld radio, signalling mirror, water dyeing tablets, strobe light, whistle). They will be rented out in the same manner as and together with the survival rafts. Further details are to be found in the EMPOA webforum. Every pilot is responsible himself for the functioning of the equipment. Due to the pyrotechnic nature of the rescue equipment it is to be held and operated by persons age 18 and up only. Additionally it is planned to purchase four sea-survival suits within the next year (2*L, 2*M).

Ines Bauer: Exonerated the members of the board in separate votes. All votes were unanimous with one abstention each.

David Kromka: Requested all members to participate at the organisation of activities for the club. There was also an outlook to future projects:

1. Benni und Co: We are looking for a responsible person within the membership of the club. Volunteers are asked to contact the board.
2. EMPOA Young Eagles: A program to promote our Mooney spirit to future generations and help grow the new EMPOA
3. EMPOA Cars: We are working on a prime partnership with App2Drive in the near future.
4. EMPOA Christmas Party: Still looking for a place for the venue to take place. Ideas highly welcome.
5. Working on the statutes: A change of our Statutes is being proposed for 2019. Too many things are unclear in the present version. The board is to be enlarged from three to five members. Public Relations Manager as well as Technical Director are supposed to become formally new members of the board in the future.

Notes: Lukas Straubinger





TruTrak VizionPMA

A new generation of autopilot

Submitted by Pierre Drapeau

Lately, when it comes to technological changes, type certified aircrafts have been lagging behind the more dynamic and less regulated amateur-built sector. This is mainly due to the presence of old and rigid certification rules; some dating back to the 1950's, and the unwillingness of lawmakers to support newer solutions. In August 2017, following consultations between the FAA, EAA and AOPA, among others, new and more flexible certification rules were approved and



implemented to promote the emergence of new equipment aimed at improving the safety of general aviation. Some major manufacturers, such as Garmin and their G5, took advantage of this breakthrough. Smaller ones, previously confined to the amateur-built market, saw a possibility to transfer their expertise as well as an opportunity for growth. TruTrak, a manufacturer founded in

1999 to offer an autopilot solution for the amateur-built sector, decided to enter the certified market with their VizionPMA.

I recently met TruTrak's Sales manager, Corey Reed, at their Springdale, Arkansas facility, to learn a little more about this new product. Supported by a small, motivated and dynamic team, using state-of-the-art equipment and a technology that has been proven by their years in the amateur-built market, TruTrak produces one of the most attractive new autopilots in today's market. Most of their suppliers are located within 100 miles, thereby promoting the region's economy. This also provides flexibility and predictability to their production line.



Now, let's talk about the product. The VizionPMA is lighter and has fewer components than current certified autopilots. It is already available under STC for the Cessna 172, 175 and 177 as well as Piper's PA28 series. In the coming months, TruTrak will be adding the Cessna 180, 182 and 185 to the list as well as the Piper PA32 and **Mooney**. Specialized software communicating with portable or panel-mounted GPS are at the base of its operation. The controller, mounted on the panel, houses the brain of the system and is available in standard sizes, either as a 2.25" or 3.125" circular instrument, or a 4" x 1.25" flat-pack format. The VizionPMA controls the movements of the aircraft via two servos. One is located in a wing, controlling the roll. The other controls the longitudinal



axis, acting on the pitch. It also uses pitot and static connections, which helps the autopilot monitor aircraft performance.

Combined with most modern certified GPS Navigators, as per the ARINC429 standard, the VizionPMA will fly a flight plan, including IFR routes, LPV approaches and other published maneuvers, such as a missed approach, holding patterns and SIDs. As Corey said: «Think about whatever magenta line is on the GPS then the VizionPMA will follow it.» Even better, the autopilot will predict turns and steer the aircraft without an external

GPSS. Although the use of the system is limited to an altitude of 700' AGL, it is more for certification purposes than precision considerations. It is also designed to work with a non-certified GPS, with RS232 connection, but the steering will not be as effective as with a GPSS. It will follow a route, but will not be able to fly an approach.

The VizionPMA can also be used in manual mode so you can enter a target or cleared altitude, add a rate of climb/descent to control vertical maneuvers and also use it as an altitude hold. It allows you to fly a selected track and follow ATC instructions. Since the VizionPMA is not connected to the DG, flying a heading will require some correction. NOTE : When given vectors by ATC, you should inform the controller when flying a track instead of a heading.

Here are some additional features of the VizionPMA aimed at improving safety:

- **CWS (Control wheel steering button):** Located on the yoke, this control will disable the autopilot in case of malfunction or to revert to manual mode. This can also be achieved by pressing the knob on the controller, using the A/P master or by pulling the A/P circuit breaker.

- **Emergency level mode:** A control located in a central position on the panel will activate this mode and stabilize the aircraft to remedy any unusual situation or a loss of control.
- **AEP (Automatic envelope protection):** With the autopilot disengaged, a passive function will activate the aileron servo to avoid banks greater than 40 degrees.
- **Backup gyro mode:** When the GPS signal is lost, you will still be able to use the autopilot in a wing leveler mode, selecting up to +/- 30 degrees of bank. Altitude functions will not be affected by loss of GPS signal.
- **Minimum/maximum airspeed:** If a maneuver will take the aircraft into a stall or exceed Vne, the autopilot will issue a warning and will lower or raise the nose to stabilize the aircraft. Once resolved, the autopilot will resume its previous mode.

With its numerous features, the VizionPMA will benefit both the VFR and IFR pilot. From flying a cross-country trajectory to maintaining a hard altitude in a busy controlled environment, VFR pilots will appreciate this extra pair of hands. For IFR pilots, this technology will make it easier to integrate the IFR world and focus on other tasks. The clientele should include owners of aging autopilots needing repairs and others wanting to add an autopilot to their certified aircraft. Both should be attracted by this recent and user-friendly technology.

Cost of the VizionPMA is \$5,000 and includes the controller, 2 servos, harness and install kit. Installation is estimated at around 25 hours, so the final bill should be close to \$7,500. Although it only works with GPS technology, comparing it to other autopilots on the market, the ease of use and total cost, should help sales numbers. Most importantly, because of the embedded features, the VizionPMA should help improve the safety record of our general aviation fleet. This would be a major step in the right direction.



Black Hole Airports

These airports have no visual cues and the only light in the area is that which is provided by the airport lights. At night, Pilots landing at a Black Hole Airport, tend to fly a shallower glide path and could touch down short of the runway. If possible, you should back up your approach with PAPI/VASI or an instrument approach. If you're unsure of your position or altitude, go-around.



Parts for Sale

I have several Mooney parts for sale from a 1969 G model. Brand new voltage regulator (never used). Instrument light rheostat controller, cowling plugs and like new fuselage/cockpit and tail feather covers. G model POH. Contact me at Wilson Brown, located in Georgia, 678-469-6182

Wanted

Time on your Mooney. Hangar available. I only need 20-30 hours yearly. I have an empty hangar in Cartersville, GA for your Mooney or Cirrus @KVPC. 3500 hours, 3000 Mooney INST CML no accidents. Please email to: mooney201@gmail.com



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