Introducing the Master Aviator Program

PA46 Safety By the Numbers

Charlie Precourt: Safety Programs that Work

Who Needs a Tailwheel Endorsement?

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Welcome to our inaugural Safety Annual

It is our intention to use the final issue of each calendar year to place greater focus on safety and what we as an organization can do to make our community more proficient, educated and in the end, safer. This issue gives us the opportunity to “think globally” about the state of our PA46 safety record and best practices for improving it, and then provide you tools to “act locally” to make your daily flight operations the safest it can be.

The MMOPA Safety Committee has been working this year to identify how we can make a significant impact on safety. In addition, their goal is to engage as many people as possible beyond weekend safety events. As the saying goes, knowing the nature of the problem is the first step toward a solution.

At this year’s National Business Aviation Association Single-Pilot Safety Standdown, NBAA Safety Committee member Dan Ramirez shared that after studying data from more than 2,000 single-pilot GA accidents, these events tend to fall into three categories: runway excursions, undershoot/overshoot landings and loss of control in flight. Not surprisingly, these scenarios are similar to the ones that plague our PA46 community and are the focus of our Safety Committee.

So, at this year’s MMOPA Convention, the Safety Committee led by Joe Casey unveiled the MMOPA Master Aviator Program. This program focuses on the three key areas that led to accidents in the PA46 community: loss of control, skill deficits in directional control and lack of proficiency due to not flying enough. The program adds a spirit of competition among our members to work through progressively higher levels within the program. Members who complete the requirements will be recognized and awarded their Aviator, Senior Aviator or Master Aviator “wings” at the 2019 Convention. Read more about the program on page 36.

The Safety Committee is also working on Operational Practices for the PA46 community. This is different than “procedures” in that it provides a consistent, repeatable way of approaching certain tasks or series of tasks throughout each phase of flight, rather than hard-and-fast rules. The idea is that if you fly your plane in a consistent, disciplined manner, you’ll have more bandwidth to recognize and respond to abnormal conditions or situations.

Finally, I hope you have downloaded and are using the MMOPA FRAT tool. It is available in the Apple App Store, is an iOS tool especially designed for the PA46.

All of these activities (and more are in the works), have made possible by the hard work by our volunteer members on the Safety Committee. In addition, the newly formed MMOPA Safety & Education Foundation will ensure that the fruits of their labor are available to all MMOPA members. The Foundation supports safety programs, events, resources and tools for the PA46 community.

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The 2019 MMOPA Convention & Fly-In
May 29 - June 1 – Ritz-Carlton, Amelia Island, FL

Cover photo: MMOPA Members Peter Scoville (Meridian) and Jim Pulju (JetPROP) over Colorado Springs during the 2018 Convention. Photographed by Glenn Watson, Mach Point One Aviation Photography.
Table of Contents Photo: Courtesy of Peter Stratton
MMOPA Member Guide
Malibu M-Class Owners & Pilots Association

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The Malibu/Mirage Owners & Pilots Association (MMOPA) is a not-for-profit organization dedicated to the interests and safety of owners and pilots worldwide who fly PA46 derivative (Malibu, Mirage, Meridian, JetPROP and Matrix) aircraft. MMOPA was founded in 1988, and now serves nearly 1,000 members. MMOPA is not affiliated with the Piper Aircraft, Inc., of any other manufacturer/vendor.

Membership is available to any registered or prospective owner and/or operator of qualified aircraft or any qualifying individual or organization involved with or providing a service for the PA46 family of aircraft. Dues are $250 annually and includes a subscription to MMOPA Magazine, access to the MMOPA members website and forums, Jeppesen subscription discounts, and eligibility to attend MMOPA events and activities (additional fees may apply to some events).

Member-Only Benefits & Services

MMOPA ONLINE FORUMS: One of the most active online forums in general aviation, the MMOPA forums has dozens of messages posted each day. It is the ideal place to discuss ownership, safety, operational and maintenance topics, absorb information or get any question answered.

MMOPA HOTLINE: Members have access to experts to answer questions regarding airframe/engine, avionics, legal issues and general membership.

MMOPA LIBRARY: The MMOPA website has an in-depth library with a variety of maintenance instructions and best practice documents, checklists, POH’s and guides. In addition, there are training and safety content, Service Bulletin information and back issues of MMOPA Magazine. New resources are continually added and updated.

ANNUAL CONVENTION: Each year, PA46 pilots and enthusiasts gather for a four-day event featuring seminars, vendor trade show and social activities. The convention is open to MMOPA members and nonmembers.

MMOPA SAFETY & EDUCATION FOUNDATION: A 501(c)(3) charitable entity, the Foundation is an independent entity that is dedicated to engaging with MMOPA members to help them operate their PA46 aircraft in the safest possible manner. The foundation’s sole purpose is to promote, support and fund safety initiatives, programming, resources and tools. In addition, it may include direct vouchers to MMOPA members who attend training programs provided by MMSTF and M-Class.

JEPPESSEN SUBSCRIPTION DISCOUNT: Members receive a 15-month subscription for the price of a 12-month subscription. The savings alone more than cover the cost of MMOPA’s annual membership dues.

MMOPA TRAINING DIRECTORY: MMOPA Vendor Members who have represented that they offer type-specific initial and recurrent PA46 training with an insurance-approved syllabus.

RACE INITIATIVE: MMOPA and Piper Aircraft have developed a means for members to submit input to the Piper RACE Team (Reliability of Aircraft & the Customer Experience). This is a streamlined mechanism for real-world user experience from members to be provided to decision makers at Piper, for the purpose of making product design changes that benefit the PA46 fleet.

MARKETPLACE: Members and vendors can list aircraft, parts, services and other aviation related items for sale in this online listing service.
How can you help? You can make a charitable contribution to the MMOPA Safety & Education Foundation to fund the development of safety programming. The Foundation is funded through the generous donations provided through the Convention charity auction, as well as individual contributions. Consider the Foundation in your plans for end-of-year giving. Checks can be made payable to: MMOPA Safety & Education Foundation, 18149 Goddard St., Overland Park, KS 66013. If you have questions, send an email to safety@mmopa.com.

Second, MMOPA depends on the passion, talents and energy of MMOPA volunteers. Please consider serving on one of MMOPA’s committees. They consist of:

- Academic/Convention
- Membership
- Magazine

Lastly, if you’ve had an experience that others could learn from, consider writing an article for MMOPA Magazine. As your editor, I’m here to help with the “writing” part; what matters is that you share what you’ve learned so that others can benefit.

As Manny Casiano reports in his safety brief, it’s been a good year for safety in the PA46 world. Let’s keep it that way by training effectively, flying more and addressing areas of your skillset and proficiency that will make you an even safer PA46 pilot.
Congratulations MMOPA members who attended the Colorado Springs Convention at the beautiful Broadmoor. Due to a sudden acute condition, a.k.a. rogue gallbladder, I could not attend much to my disappointment. But I have heard from many longtime MMOPA members this event was the best convention ever. Strong praise from several with exceptionally high standards. I hope all felt that way. The only credit I should receive is for lobbying with Bill Alberts and the MMOPA Board for a return to the Broadmoor years ago – perhaps four or five. So, I am thankful the convention was a huge success. But the real credit goes to our very talented Executive Director Dianne White and my last-minute stand-in Jon Sisk. And of course, the academic director Mary Bryant who, along with Bill Alberts, put together an informative and interesting academic program.

MMOPA Safety and Education Foundation

I am most proud of the announced new 501(c)(3) entity created for the implementation of flight safety and education for PA46 aircraft, which will return to every participating member more dollars than a member pays to MMOPA to be a member. Those Foundation dollars may be used for supplemental training with MMSTF seminars, M-Class seminars as well as training referenced in Joe Casey’s presentation at the convention as well as described in the pages of this magazine issue. Your Board had studied carefully the issue of safety and how best to serve as many members as economically feasible rather than a select few members. This new Foundation is the result in conjunction with the work of Joe Casey’s and...
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Bart Bartlett’s Safety Committee whose members include Dave Bennett, Hank Gibson, Bill Inglis, David McVinnie, Charlie Precourt and David Purvis. The Foundation also has a new website: mmopasafety.org with more materials to be uploaded in the coming weeks.

President’s Award

This year the President’s Award was bestowed upon Manny Casiano at the convention. For those who did not attend, past recipients included:
- 2004 David Coats
- 2005 John Mariani
- 2006 Kevin Mead
- 2007 Johnny Foster
- 2008 Mona Rathmel
- 2009 Bob Kromer
- 2010 Sy Weiner
- 2011 Russ Cauwe
- 2012 Henry Van Kesteren
- 2013 Jonathan Sisk
- 2014 Jeff Schweitzer
- 2015 Tom Kieffer
- 2016 Bill Alberts

Interesting facts about Manny:
- Soloed on 16th birthday (waited until next day for driver’s test)
- Pilot since 1970; PA46 owner since 1997
- General surgeon & hospital administrator
- MMOPA President 2015-2016. Term emphasized collaboration with Piper.
- Past chair, MMOPA Safety Committee
- Has delivered MMOPA Convention Safety Review since 2006, stressing aspirational goal of zero PA46 accidents

My comments, which Jon Sisk read to the attendees:
“Manny:
Wish I was there to hand this well-deserved award to you in person. You personify the meaning of the President’s Award as you have selflessly year after year dedicated your time to the advancement of safety in the PA-46 airframe through your insightful objective analysis and Convention presentations of PA46 crash data and then guided this organization in the same thoughtful objective manner as MMOPA’s President.

Thank you, Manny, for a job well done. We all look forward to your continued contributions.”

MMOPA has been blessed with many talented contributors to the organization including each one of our members. Your Board will be meeting in early 2019 to discuss new Board members, which will be nominated and then voted on at the Amelia Island Convention to be held the week of Memorial Day in 2019. Please consider notifying one of your Board members or our Executive Director if you have an interest in serving on a committee or participation in our organization as a Board member.

2019 MMOPA Convention

To avoid the chaos of having the interruption of another hurricane, MMOPA’s Board has voted to move our conventions from the Fall of the year to the Spring. Our next convention will move to Amelia Island, Florida Wednesday May 29 through Sunday June 2, 2019 following Memorial Day. This, too, is a return venue for MMOPA at the beautiful Ritz-Carlton with two golf courses just outside the front door! Our Executive Director along with our convention planner is planning an outstanding academic presentation along with a special event to be announced at a later date. Please plan to attend; I certainly will be and hopefully no medical issues for me.
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We learn through our experiences” or better still, the experiences of others. I’ve avoided the word “mistakes” because we also learn through good experiences. The information presented here is collected from the FAA and other public sources. Keep in mind that a lot of events go unreported. In this review, we’re going to look at the PA46 fleet data from 2009 through October 2018.

The past 10 years have seen the worst year ever (2015) and the best in two decades (2016). There’s really no particular explanation for the huge differences. Our sample is very small meaning a single event can sway the numbers in a big way. Statistically, we base our percentages on an average of 150-hour per flying aircraft and we remove airframes that have been destroyed/parted out or deregistered following an event. It’s far from perfect. Some fly more, some less and the “experts” I’ve talked to say it’s about as good a guess as we can make without auditing the aircraft logbooks.

The PA46 vs. the Rest of GA

So how do we compare? A look back to the beginning reflects a continuing safety improvement since the line was introduced. Our non-fatal event count descends steadily and is now nearly a match to the rest of general aviation. The Malibu was the first production single engine pressurized GA aircraft certified for Flight In Known Icing (FIKI) and the initial fatal accident rate reflects the challenges it presented. Training and experience allowed a steady, albeit slow improvement and we are now very close to the GA average. In 2017, the GA fatal
rate was .84 per 100,000 hours and the PA46 rate was .65. Because of our low numbers, one more fatal accident would have pushed our rate to approximately .98.

If we compare today’s GA rates to 1950, we’ll see the non-fatal rate drop from 46.6 to 3.3 and the fatal rate from 5.1 to .84. We continue to make progress, but we’ll never be finished. Ron Machado remarked a few years back that a rate less than 1.0 per 100,000 was really in the noise level and that it would be extremely hard to do much better. Agreed, but that doesn’t keep us from trying.

Some notes on the graphs. The lines between the different categories are blurred because most accidents have more than one risk factor. A departure into IMC can result in a loss of control, i.e. stall/spin. I felt it prudent to call out the areas were our issues lie (the numbers will not add up). I also revised the data to separate loss of control (LOC) into takeoffs, landings and accidents were a stall/spin were probable. My new term, Loss of Directional Control (LODC), refers to events during runway operations.

**LOC & LODC**

Loss of control in flight is always lethal (stall/spin). I’ve often said, “In a PA46, if you land under control and don’t hit anything head-on, you’ll walk away.” If you land out of control (stall/spin) you’re not going to survive. The gateway to this category is weather. Most of these accidents involved convection, icing, IMC or a combination. Our last three fatal accidents involved convection/icing and they also included a connection to datalink weather. With weather in the lead, it’s more than appropriate we re-evaluate our weather savvy. It seems the government wants to get out of the briefing business and focus on producing on-line weather products. There is a significant shift in this jigsaw puzzle approach that assumes any pilot can build a complete picture from the hundreds of weather products available online. The time and effort needed to do it properly may be more than some are capable or willing to invest. If you’re not comfortable in this environment, limit your exposure.

The LODC on takeoff has a higher probability of being serious due to the high angle of attack, high power and overweight conditions. Three of our fatal accidents were departures into IMC and two involved convective activity; all with fatal results. On the non-fatal side, five were triggered by loss of engine power/failure. At least three involved seriously overloaded aircraft.
I had an opportunity to work as an expert witness on a fatal accident trial that focused on pilot negligence. One of the plaintiff’s arguments centered on pilot negligence because the aircraft was about 10 pounds over the maximum landing weight at the time of the accident. Although not causal, it bears out the importance of respecting the POH limits.

The LODC on landing is normally a low-power, lighter-weight scenario and is understandably less lethal. The single fatality involved an expedited return combined with a stall/spin. The remaining 35 instances resulted in few injuries but lots of damage (read insurance). Your MMOPA Safety Committee introduced “Operational Practices” at the convention in the hopes of reducing the variances we see in day-to-day operations. One of the standout areas involves the “stabilized approach.” This somewhat mysterious maneuver involves approaching a runway at the correct speed without large or rapid changes in pitch, power or airspeed. Those who arrive unstabilized, too fast and at or near the crosswind limits are destined to join the less fortunate.

**Pilot Distraction & High-Stress Flights**

Most of you cannot fathom a situation where a pilot was SO distracted he or she forgot to lower the gear. It happens more often than you think, and YOU are not immune. Family issues, primary emergencies and in-flight distractions can overwhelm the best of us. My research shows several cases where a primary system issue (engine/gear/electrical) or weather triggered the oversight. Electrical leads the way, backed up by the fear of a fire. The emergency gear extension would have worked in most of these situations. Problem is, folks were so distracted (and we can understand) that they either didn’t try or didn’t slow down enough and the nose gear didn’t lock. Jonathan Sisk, your MMOPA Ombudsman, manufactured some reminder stickers that can be stuck on the emergency gear extension knob as a last chance reminder. If you’d like one, let Executive Director Dianne White know.

Gear-up landings and gear failures are not counted as accidents unless they result in injury or aircraft structural damage. The redesigned engine mounts for the Mirage and Matrix have reduced the number of mount failures but they have not totally eliminated the problem, especially for aircraft that still have the old-style mounts or pilots who have not recognized the value of a stabilized approach (see above). Not solved: Towing issues. Try to supervise whenever possible.

Our monthly accident rate overview changed a bit, and it seems to be leveling. We still see a boost over the summer/winter holidays when we use our fabulous machines for travel. These trips tend to be high stress as we strive to impress our relatives with the wonderfulness of GA. Of course, the weather during the holidays is usually hostile, which adds to the stress. Have your mechanic tune up your cold-weather systems and your instructor tune up your piloting skills.

**Mechanical/Fuel Issues**

The debate over engine reliability continues. We experience about one turbine issue per year; generally, a roll-back of some sort related to fuel control unit settings, low NG or temperature issues with the fuel/oil heat exchanger.
The piston fleet sees an average of 2.5 failures per year. A couple were fuel management issues and included misfueling, fuel quality issues, or poor fuel planning. We’ve had one confirmed misfueling, resulting in a fatality and two or three suspected fuel contamination events. Three of our in-flight failures in the Continental ships were suspect fuel icing events. Further investigation indicates that water in the fuel was a likely cause. Problems with leaky caps or tainted fuel sources can expose the operator to increased risk. Fuel exhaustion resulted in deadstick landings for a Mirage in Arizona and a Malibu in Mexico in the past 24 months (not something that points to the engine manufacturer). There were a couple catastrophic engine failures and an untold number of turbo failures.

LODC landing and gear failures share many of the same areas including pilot technique, crosswinds, tire failure, rigging, towing damage and the like. I counted 51 events between 2009 and October 2018. It can be hard to figure out the exact cause and, in many cases, the pilot did everything right. Consider checking your gear/tires as often and thoroughly as you check your oil.

Weakest Link?

The pilot remains the weakest link in the process. We plan the flight, conduct the preflight, determine the fuel requirements and control the loading. As pilots, we also evaluate the weather before and during the flight and we make the decision to “press-on,” divert or not go at all. With rare exception, we can control the outcome. Ensuring the safety of ourselves and our loved ones is a responsibility not to be taken lightly. Be safe out there and remember “There’s nowhere you need to be or nothing you need to do that’s more important than your safety!”

Number of Accidents: Fatal/Non-Fatal

NOTE: *Gear collapses are not always considered accidents.

<table>
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<th>Aircraft Type</th>
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<th>Non-fatal</th>
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<td>17</td>
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<td>Meridian M600*</td>
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Number of Fatal Accidents/Fatalities: 38/90
Total number of events (Accidents/Incidents/Other): 228
You probably already know it, but you have a really committed, top-notch MMOPA Board of Directors. They are all volunteers, receive no compensation, and are completely dedicated to the safety record of the PA46 fleet. I’m the “newbie” on the MMOPA Board and I epitomize the word “rookie” when it comes to director work. But, every now and then, on occasion, a rookie can impact the outcome of the game. So, with complete ignorance of what an MMOPA Director is supposed to do, I decided that I was going to find a way to make a positive difference. Although I didn’t know it when I first joined the team, that difference was to be the MMOPA Master Aviator Program.

It all started about a year ago (Fall of 2017) in Tucson, Arizona at my first MMOPA Board meeting. Prior to the meeting, I was asked to present my ideas to improve the operational safety within our fleet. So, I eagerly took up the challenge and ended up with a short four-slide presentation that included a general synopsis of the accidents that happen in our community and my perceptions of client performance during recurrent training. Those four slides created a nearly one-hour discussion amongst the directors that afternoon, and resulted in them requesting me to refine my thoughts into a plan to address those problems.
My analysis of the accidents in the PA46 community place most (not all, but most) accidents into two broad categories:

1. A stall/spin accident – The stall/spin accident is always fatal for all onboard the airplane. But the stall/spin is not the cause, rather it is the result. It is usually precipitated by some other situation that is mishandled such as fumbling the autopilot controls, inappropriately handing ice accretion, over-rotating on takeoff, or botching an engine failure. There’s lots of ways to create a “stall and a yaw” in the PA46, and most pilots do not understand the dire implications.

2. A ground accident – These accidents are rarely fatal and are almost always costly. The insurance companies hate them. These ground accidents include mishandled crosswinds, brake failures, tire failures, left-turning-tendency mishandling, and nose gear collapses. The result is usually a wing-ding, prop strike, or gear collapse, but the insurance company gets involved and everyone loses in the event.

My general analysis of client performance at recurrent training is:

- **PA46 pilots don’t fly enough:** 100 hours/year is the breaking point. Those that come to me with 100-plus hours in the last year usually perform well, and those that don’t have incrementally poor performance as fewer hours are flown.

- **PA46 pilots generally have poor footwork:** I see some terrible footwork on landing, takeoff, and even while maneuvering in flight, even from experienced PA46 pilots.

- **PA46 pilots don’t understand the stall/spin accident:** Most pilots cannot tell me the difference between a slip and a skid, and don’t know basic stall/spin recovery techniques.

- **PA46 pilots don’t receive consistently good training from providers:** I hear a common lament from clients about the wide range of instructional strategies and instructional ability of some instructors, mainly the newest instructors that don’t have much PA46 experience.

**How Do We Fix This?**

The MMOPA Board heard my recommendations, agreed wholeheartedly, and dutifully sent me away with the homework assignment: Begin the process of assembling a safety initiative to solve those problems.

At the next board meeting in the spring of 2018, the MMOPA Board again focused its attention on safety initiatives. Executive Director Dianne White asked former Air Force test pilot, space shuttle commander and former JetPROP owner Charlie Precourt to join a portion of our meeting via video teleconference as we discussed safety initiatives. His input was crucial in focusing everyone in the room on a solution. It was clear that my basic framework of ideas was good and moving in the right direction, but I needed help. It was decided to reactivate the Safety Committee to tackle the problem.

Collaboration was the key. We had unity amongst the board members, but we needed unity amongst the training providers that are dedicated to the PA46 community. An initiative created by one person would never gain traction; an initiative created by a team of dedicated professionals can change everything. I was to be the chairman of the committee, and we then began the process of assembling a team of instructors to do the grunt work required to birth a good safety initiative that everyone would support.

The following individuals agreed to serve on this all-volunteer, unpaid committee:

- Joe Casey, MMOPA Board Member, PA46 CFI
- Bart Bartlett, MMOPA Board Member, PA46 CFI
- Dave Bennett, MMOPA Board Member
- Hank Gibson, PA46 CFI
Bart and Dave were obvious choices to join the committee. As pillars of the PA46 community for over a decade, each brought not only a wealth of experience to the table, but both are presently on the MMOPA Board and were able to ensure the focus of the committee remained the focus of the MMOPA Board.

Hank Gibson is a relatively new CFI to the PA46 community with just over two years training in the PA46, but with more than 4,500 hours of flight time and more than half of that as dual-given, he is no flight training rookie. Hank represents the future of the PA46 CFI, and I was super-excited to have him join the team.

I really hoped Bill Inglis would be willing to join the committee, and he readily agreed despite having a busy training schedule. As the owner of Legacy Flight Training, the Piper-approved training facility for owners of all new aircraft sold, Bill’s input was important to the success of the Master Aviator Program.

David McVinnie is no stranger to the PA46 community, being an instructor and FAA-DPE in the Albuquerque, NM area. David also teaches with MMSTF and assembles accident data for the PA46 community. I was very pleased when David agreed to join us.

Charlie Precourt is a household name in the general aviation community and is an EAA Board Member. Most know of his exploits as a NASA Shuttle commander, and many read his excellent monthly contributions to some of the most widely-read aviation magazines. A relative few know of his work in the Citation Jet Pilots Association world as the Chairman of the CJP Safety Committee. Charlie’s work with CJP has been widely heralded by experts as leading-edge. Charlie owned a JetPROP for many years, so his knowledge of the PA46 paired with his vast experience made his participation on our committee honoring for us all.

David Purvis has been training in the PA46 community for more than a decade, and has gained a reputation of excellence in training from his clients. David owns Vision Air, LLC, which is based out of Denver. David’s mountain training course is second-to-none and we were thrilled that he was willing to contribute.

The team was now created, and so the work then began. We held many teleconferences and nugged out a rough draft of the plan. The rough draft changed to a finished product and the vote was unanimous: we now had a new Master Aviator Program.

The Master Aviator Program has three award levels: Aviator, Senior Aviator, and Master Aviator. Various training experiences, flight time requirements, and a record of no accidents or incidents in the last five years is required for any of the awards.

Proper stall/spin training is a key component to reducing loss of control accidents in our community. MMOPA Safety Committee has developed a list of training providers that are approved to provide such training.

Win the pin and wear with pride! Those who achieve Aviator, Senior Aviator or Master Aviator status will be recognized and awarded a specially designed Master Aviator lapel pin.
the insurance industry will soon recognize this by seeing tangible reductions in claim costs by Master Aviators. The MMOPA Board will work closely with the insurance industry to illustrate this lessening of risk exposure, and we believe this will eventually bring lower premiums for those that wear Master Aviator Wings.

The training required to progress up the levels reflects training that the Safety Committee believe will mitigate risk in the areas of operation that have been identified as weaknesses in our community. Mid-year training, stall/spin training, and tailwheel training are all important aspects of the Master Aviator Program.

**Mid-Year Training**

Mid-year training is required for any award because mid-year training has proven to increase the overall knowledge base within the PA46 community, and it allows pilots to develop a network of connections with others who share the love of the PA46. Those pilots that tend to “go it alone” with their PA46 tend to repeat the same mistakes that others have committed. Undoubtedly, the best way to grow in any particular arena is to learn from others’ mistakes and not commit those mistakes yourself. Mid-year training is always “collective training” and allows for relationships to be developed and “best practices” of others to be learned. Plus, it gives some of the best PA46 experts a megaphone to reach more pilots with their excellent content.

As of this writing, M-Class and MMSTF are the two training providers that are approved, but MMOPA hopes that other training providers will also create mid-year training programs and seek approval from the Safety Committee. We believe all PA46 pilots should train at least twice per year in some meaningful manner, so mid-year training is a natural channel for that additional training. A $400 voucher is available to assist in the payment of this training. Mid-year training must have been accomplished in the last five years for that training to apply to the Master Aviator Program.

**Stall/Spin Training**

Stall/Spin training is not aerobatic training, but rather training that teaches the pilot how a spin can develop, why it is such a dangerous flight regime in any airplane that is not spin-approved, and how to recover from an inadvertent spin. This training includes ground and flight training, and the flight training is always in an airplane that is approved for spins. Any training provider that is capable of providing stall/spin training in accordance with AC 61-67C applies to the Master Aviator Program. But, the MMOPA Safety Committee has developed a list of training providers that are not only approved to provide the training, but are also approved vendors to use a $400 voucher to help the pilot pay for the training.

**Tailwheel Endorsement**

An entire generation of pilots have been trained in directionally stable airplanes (any airplane with a nosewheel), and this has created a generation of pilots that generally do not know how to position an airplane properly on and near a runway. Tailwheel airplanes are directionally unstable and are completely unforgiving of any drift or misalignment during takeoff or landing. Mastering a tailwheel airplane is a requirement to become a Master Aviator.
**Progress to Master Aviator Level**

At what Aviator level does an experienced PA46 pilot enter the Master Aviator Program? That pilot would simply move up the levels based on the training he/she has received. So, if a pilot has 300-plus hours in the PA46, has a tailwheel endorsement, and has attended a mid-year training event in the last five years, that pilot would enter the Master Aviator Program at the Aviator Award. But, if that pilot were to receive stall/spin training, that pilot would instantly move up to the Master Aviator Award, and be recognized at the next MMOPA Convention.

Using another hypothetical example, if an experienced PA46 pilot were to have a tailwheel endorsement, had received stall-spin training, had attended a mid-year training event in the last five years, and had more 300 hours of PA46 flight time, but have flown only 70 hours in the last year, that pilot would not qualify for any of the award levels. But, if that pilot were to fly additional hours so that he/she had 100-plus hours in the last 12 months, that pilot would be awarded the Master Aviator Award.

To retain the Master Aviator Award for successive years, a pilot need only attend some type of aviation training event and have flown 100 hours in the last year.

Will the Master Aviator Program prove beneficial to our community? That completely depends upon membership participation. It is the hope of MMOPA that all pilots will embrace the program and gain the training required for awarding.

At the most recent MMOPA Convention (October 2018, Colorado Springs, CO) an auction was held to create seed money to the MMOPA Safety & Education Foundation. The Foundation is helping to kickstart the Master Aviator Program. Wildly successful by every measurement, the auction provided approximately $50,000 to help support the program. Many vendors donated auction items and as many members were willing to buy those items at above-retail pricing, all knowing the money was to go to a great cause. I was floored by the overwhelming support of the membership.

So, the Master Aviator Program is up and running, and ready for full participation. If you’ve not planned upcoming training, I challenge you to do so. The training should be fun and fruitful. If you complete the program, MMOPA will be honored to pin Master Aviator Wings on your chest.
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Not every accident or incident is “pilot error.” Things break without warning, and good pilots sometimes get thrown into unforeseen difficult situations. It’s not always the pilot at fault.

Pilots work in a dynamic, ever-changing medium. Weather changes abruptly, there are a gazillion moving parts on most airplanes, and airplanes (by nature) are not robustly designed because weight is a concern. All of this translates into the potential of tough scenarios that demand a pilot who can assess the negative situation, apply quality corrective measures, and ultimately “adapt and overcome.”

The MMOPA Broken Wings Award honors those pilots who were forced into dilemmas not of their making and overcame the challenge safely and responsibly. This ranges from something as dramatic as an in-flight engine failure handled well, to a situation where a series of preemptive good decisions dramatically reduced the risk of danger. The stories of those pilots in crisis should be told so that others can learn from their competence.

The membership of MMOPA should send those stories to the MMOPA Executive Director, safety@mmopa.com. The MMOPA

The MMOPA Broken Wings Award

Recognizing when you do things right when things go wrong.

by Joe Casey, Safety Committee Chair
Executive Director shall forward those accounts to the MMOPA Safety Committee for consideration for the Broken Wings Award. The Safety Committee will review and analyze the entries (at the meeting two months prior to the MMOPA Convention) and determine pilots shall receive the Broken Wings Award, which shall then be presented at the subsequent MMOPA Convention.

One of the best ways to learn is by example, and the MMOPA community is full of pilots who set the bar high in handling adversity in flight. The Safety Committee is excited to publicly honor those who overcame in those tough situations, with the hope and anticipation that it will help others do the same.

Characteristics of events which deserve the Broken Wing Award are:

- The occurrence must be from an in-flight situation;
- The pilot must show extraordinary skill, judgment, and technique during an in-flight emergency;
- A successful landing must have occurred;
- Extreme circumstances which might have led to catastrophic results must have existed;
- The pilot cannot have induced the emergency situation through neglect, poor decision-making, or ill intent.

A “Broken Wings Award” application form is available under the Safety tab at mmopa.com.
Imagine a year when there are no fatal accidents in general aviation... seem impossible? The airlines achieved that many years ago, and so can we if we focus on the right things in our safety programs. In fact, the overall trend in general aviation accident rates over the last few years is very encouraging. AOPA’s Air Safety Institute published its annual GA Accident Scorecard recently revealing fatal accidents from 2008 to 2017 are down more than 30 percent. There were nevertheless 185 fatal accidents in 2017, so we still have a long way to go. But, there are many developments in safety programs across GA that can keep the trend going.

Your MMOPA Safety Committee has adopted some great initiatives, like the FRAT tool, the Proficiency Assessment Review, accident reviews at the convention, and now the Master Aviator program. These programs appropriately focus on helping us perform better as pilots. The 2018 Nall Report, also put out by AOPA’s Air Safety Institute, shows pilots account for 74 percent of the fatal accidents, so it was great to hear of the enthusiasm MMOPA’s Master Aviator Program generated at the convention in Colorado Springs.

In my involvement with the Experimental Aircraft Association (EAA) and the Citation Jet Pilot’s Association (CJP), safety initiatives similar to those at MMOPA reveal a couple of important points. One is that a culture of safety is growing broadly across most sectors of GA, and perhaps more importantly there is much to learn from each other about the effectiveness of these various initiatives. EAA has seen a four-year drop of 47 percent in fatal accidents among homebuilts! So there must be something right going on there. A major focus on appropriate transition training before flying a new homebuilt is paying off.

When I joined the CJP safety committee that organization did not have a Safety Foundation. I introduced to them what MMOPA had established and CJP now has its own foundation that supports extra training and awareness courses throughout the year. The CJP community similarly is showing great enthusiasm for an increased focus on safety. An unfortunate fatal accident
in late 2016 involving a CJP member who crashed his Citation CJ4 into Lake Erie late at night served as a wake-up call. So in the interest of sharing, here’s some insight into progress on the safety front at CJP.

First is the inaugural CJP Gold Standard Safety Award, which is much like the new MMOPA Master Aviator award. It has been in place for a year, and it has just bowled me over with the rate of member participation. Our goal is to encourage continuous training, including enrichment training in a variety of knowledge and skill areas. The annual criteria are 100 hours turbine time, a 61.58 simulator check, a second 61.58 or six hours dual in-airplane, and additional training like upset recovery, attendance at the convention training seminars, or several other options of the member’s choosing. This year I’m proud to say we will be recognizing over 40 of our members with achieving the Gold Standard, a fantastic result for the first year!

There has also been significant progress with the CJP Safety Foundation. Training seminars were established at each of the Citation avionics manufacturer’s facilities this past year (Garmin and Rockwell Collins) with huge turnout. The Foundation also sponsored altitude chamber training at Embry Riddle, and upset training at Flight Research in Mojave, involving training in both an aerobatic jet trainer as well as in the member’s own Citation. The incentive to attend was credit to the Gold Standard Safety Award.

The work of the Safety Foundation is bringing more ways CJP can invest in its members, with opportunities to enhance flying skills and the overall Citation experience. The Foundation also produced a series of cool videos on safety entitled “What Good Looks Like.” These showed a contrast between a poor and a professional example of things like preflights, pre-takeoff briefings, approach briefings and autopilot management.

Another major CJP initiative this year has been development of CJP Standard Operating Practices. The CJP Safety Committee noted, “It’s not our job to tell you how to fly your airplane. It’s our job to give you some things to think about when you do.” I really like that philosophy. In fact, the P in SOP’s refers to “practices” (not “procedures”). Procedures imply things you must do, while practices represent the best techniques, we can recommend to you in operating your aircraft.

And this is exactly the approach currently underway at MMOPA, led by Joe Casey, to establish Operating Practices for the PA46 community. The important point in OP’s is to recognize that the safest approach to accomplishing a flight task is one that leverages consistency. If you adopt practices that enable consistency, you’ll have far more bandwidth to handle the unexpected. On the other hand, if you are inconsistent, doing a flight task differently each time, you’ll always be struggling to keep up.

The first edition of the CJP SOPs will be published and distributed at their convention later this month. The document is concise, divided into a generic section that is relevant to all Citations, and a model-specific section, which distinguishes between Pro Line 21, Garmin G1000 and Garmin G3000 operating practices. We will present the content of the SOPs during the CJP convention as part of their Safety Standdown. We’ll use a Jeopardy Game format and cover the meat of what’s in the SOPs so everyone is familiar with them at the conclusion of the convention. This will be a LIVING DOCUMENT, and we’ll plan to share with MMOPA the lessons learned from its initial year in use.

As we head into next year, CJP’s Safety Committee looks to focus on a couple of additional initiatives. One that could be of interest to MMOPA is focused on improving single-pilot resource management. We are exploring ways that our automation tools can be exploited to benefit both preflight decision-making and postflight critique. With tools like ForeFlight, we envision that a FRAT tool could be automatic, not requiring you to answer a bunch of questions. Think about it, if you use the app for your logbook, it knows your currency. When you file a flight plan it knows the weather and from the time of day it can pretty much estimate how long your duty day will be at landing. It can pretty much pop up a FRAT score as soon as you file…and give you some ways to improve a red or yellow condition to green.

Similarly, on the post-flight end of things, with a bit more input from aircraft parameters like pitot static data and power settings, it could determine how well you flew a particular flight. It could send you an automatic postflight message that points out whether your course maintenance on that ILS was within tolerances, or whether you achieved a stable approach. This would make every flight a training flight, even if you don’t have someone in the right seat to point out your errors, an App with that capability could.

So, there are some exciting things underway making safety programs work for us. Let’s all look forward to our first year in GA without a fatal accident, and let’s make it soon!

Charlie Precourt is a former NASA chief astronaut, space shuttle commander and Air Force test pilot. He is vice present and general manager of Propulsion Systems Orbital ATK, and also serves as chair of EAA’s and CJP’s Safety Committees. He has accumulated more than 11,000 flight hours.
“HPA is amazing... absolutely the best service I've ever had the pleasure of dealing with. As a loyal customer of theirs for 10 years, I can give them 5 out of 5 stars. Can't imagine taking my plane anywhere else. In fact, I took my plane there even though it cost me out of pocket when it could have been covered by warranty elsewhere.”
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Bill F, Olathe KS (KSEE)

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– Kirby Chambliss
Red Bull Air Race
Champion
M600 owner
It was a normal day, with a normal flight as Joanna and I were repositioning back to our home airport after an Angel Flight we completed earlier in the day. The weather wasn’t bad, however we elected to land on runway 13 to comply with our noise abatement procedures. We had a slight tailwind, maybe 6 or 7 knots and had done it plenty of times before. Thus, we didn’t give it a second thought.

As we touched down, all seemed fine until the airplane started to pull to the right. Being on the rudder pedals, I commanded the airplane to the left and stay on the runway. As I was heading down the runway, the airplane pulled harder to the right. I said to Joanna, “What is going on?” At that moment, I realized I had a flat tire.

Continuing down the runway as I let the speed bleed off, the airplane kept yawing to the right. However, now recognizing what was happening, I just let the airplane coast to a convenient place to turn off and not be stuck on the runway. Having already run on the tire and wheel for half the runway, any damage that was done to the wheel was already done.

As this was all unfolding, the worst scenarios flashed through my mind. How many lights would I take out as I ventured off the runway. Would I have a gear collapse? Would there be a prop strike? I hate to think of what the potential damage could have been to my new M350.

But it didn’t happen and I felt incredibly lucky. I kept the airplane on the runway, I commanded the airplane where I wanted it to go and I did not have any major damage. Just a flat tire.

What happened? I knew the tires were getting ready for replacement, and new ones were on their way. Sharing this story with Clay Hammond of Columbia Aircraft Sales, whom helped me into this airplane, he said he had a similar
issue. Clay had just landed one of those proverbial greasers and the lineman came into the FBO sometime later saying that one of the main tires had gone flat. Upon inspection of the tube, Clay said his valve stem had failed. On my tube, the valve stem was missing, but was that due to failure of the valve stem or rolling down the runway that sheared it off? It is interesting to note that these two airplanes were very close in serial numbers. Maybe we both were subjected to a bad batch of inner tubes.

Being one that never believed in luck, I rethought what had happened on that landing and why was I so fortunate to keep the airplane on the runway. Two points:

1. With nearly 1,000 hours in the logbook in a taildragger, one must believe there is something to being on those rudder pedals.
2. The PIC is just that – in command. I commanded the airplane where to go and with my tailwheel experience, I believe that contributed to my success in keeping the damage to a minimum.

So…do you need a tailwheel endorsement?

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As usual, our annual Convention was a great learning and sharing opportunity, made even more special by the wonderful Broadmoor location. The safety lectures this year were incredibly pertinent to our actual accident record.

On Saturday of the Convention, I presented our annual Safety Review. We have had a very good year since our (cancelled due to Hurricane Irma) convention in Charleston! In this article, I’ll review our record over the past year, and some of the lessons I learned at the Convention. (My full Safety Review presentation is available for download from the website.)

Since last fall, we have had only four accidents in the United States. This is the lowest 12-month total in two decades! Best of all, none of these were fatal. In fact, it’s been over a year since the last fatal accident in our worldwide PA46 fleet (that was an apparent IMC stall/spin crash in Germany that killed two people), and over 18 months since the last fatal accident in the United States. I truly believe MMOPA’s emphasis on pre-flight decision making (eg: our FRAT tool), along with better in-cockpit weather availability and stressing the importance of expert training, is making a difference.

First, I’ll briefly review our accidents since last fall, and then I’ll try to put this year into context. Please note that none of

A possible fuel-exhaustion accident.

Is your next flight a go or no-go? The MMOPA FRAT can help you decide.
these recent accidents have final NTSB investigation reports available, and most have only minimal information currently.

We had a Meridian accident last November, where the engine seems to have lost engine power just after takeoff gear retraction. Rather than attempt a water ditching off the departure end of the runway, the experienced pilot was able to do a 180 back to the airport property, thankfully without stalling. There was significant damage to the plane, and significant, but non-fatal, injuries to the pilot. Hopefully in time we’ll learn more about what caused this engine loss of power.

Earlier this year, a Malibu seems to have run out of fuel on a night cross-country trip with passengers. The pilot was able to land on a lighted road a few miles short of his destination, totaling the plane, but with only minor injuries to the people on board. At this time there is no evidence of a mechanical malfunction in the fuel system; it truly looks like a fuel exhaustion situation. We simply should not have this type of accident in our airplane.

This past summer we had a go-around accident on a nice VFR day. The pilot did a go-around at a 4,200-foot runway, and felt the engine didn’t produce normal power. The result was a gear-up landing just past the end of the runway. Again, we don’t yet have more information about the possible engine problem.

Finally, just a month before Convention, there was a takeoff crash in a Mirage, likely due to an overloaded plane in a high-density altitude situation. We don’t have the facts yet, but it looks very much like a takeoff that managed to lift off the runway in ground effect, but not climb out. An unfortunate aspect to this particular case is that the accident occurred on the second attempt at takeoff. During the first attempt, using three-quarters of the runway from an intersection, the airplane never achieved takeoff speed. The pilot ignored this waving red flag, and tried another takeoff using the full runway, resulting in the mush/stall accident. More information to come.

At the Convention, I also talked about a gear-up landing incident in Norway, mostly to applaud the excellent collaboration between the pilot and controller during what must have been a harrowing emergency landing after smoke in the cockpit and gear extension failure. The audio of this event is available in the safety review presentation you can download from the MMOPA website; it’s worth a listen. One of our safety lectures at Convention discussed cognitive/perceptual narrowing – the fact that humans can only handle a finite number of simultaneous tasks, and when stress increases, that number...
goes down. The result is that the pilot, in a stressful situation, will miss important inputs/clues, and thus prioritize actions poorly as a result. This happens to all pilots – military, commercial, and private.

There are two ways to combat this problem. First, the more we train, the more correct responses become ingrained and second nature. That helps when we have to devote brainpower to an urgent problem – our “muscle memory” can take over for the routine tasks as we focus elsewhere. In addition, we can recognize when this situation develops, and when under stress, find assistance to help us. That assistance can come from a flying companion, from checklists, from ATC (or best, from all three). The Norway incident is a good example of the pilot using help from ATC to deal with multiple simultaneous problems – he landed gear-up in a controlled manner in IMC conditions, and all on board walked away.

Another of our lectures at Convention talked about inflight loss of control, which is the leading cause of fatal accidents in all sectors of aviation, including airlines, the military and general aviation. Indeed, four out of the past five fatal accidents in the PA-46 (dating back to 2015) are directly attributable to inflight loss of control. I discussed two of these fatal accidents during our Safety Review,
and both have been presented in prior Magazine articles. There was spirited discussion at the Convention regarding better understanding of, and training for, the stall/spin scenario, as well as debate on the potential effectiveness of autopilot technology to reduce these usually fatal accidents.

On a positive note, and to put this past accident year in perspective, this is the lowest number of accidents we’ve had in the fleet during a 12-month convention to convention period since 1997 (which also happened to be a fatal-free year). We should congratulate ourselves on this achievement, but not get complacent.

At right is a graph of accident count and accident rate (accidents per total flying airframes) for the worldwide PA-46 fleet since the airframe’s introduction (Fig. 1). You can see the low number of total accidents the past two years. You can also see the trend line for the accident rate is generally sloping downward, at a faster rate than general aviation as a whole. This is a good thing.

Even more impressive is what we’ve achieved the past few years regarding fatal accidents. The graph above (Fig. 2) shows, for the past 27 years, the annual fatal accident count (grey line), and the rate of fatal accidents (red line). You can see the sharply decreasing trend line over time. (I am being optimistic that we will NOT have a fatal accident in the remaining two months of this year!) Note that our current fatal accident rate is one-quarter what it was during the early 1990’s.

Board members Joe Casey and Bart Bartlett discussed in some detail MMOPA safety imperatives underway.

To briefly summarize, these are: Fly more, train often, and understand the stall/spin scenario. Pilots who fly more 100 hours yearly get less rusty. Pilots who train twice yearly are more proficient. And we all need to understand how stall/spins happen, and how to avoid and/or recover. Much more information is available on the MMOPA website “Safety” tab.

For now, let’s give thanks (and even congratulate ourselves) for a low accident fatal-free past 12 months. At our 2012 Convention (which also happened to be at the Broadmoor), I showed the this graphic, and exhorted our membership to strive for zero fatal accidents (which at the time seemed near impossible).

But we’ve shown we can do it. We can fly these planes more safely, without inflight loss of control and the resulting deadly crashes. Let’s each resolve to do it again next year, and the year after that, and the year after that…
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A basic guide to the most valuable navigation device you probably rarely use.

by Joe Ratterman

If you are experienced using your airplane’s on-board radar, and you turn it on during most of your flights, then congratulations! You are a rare breed!

However, if you are like most pilots, you probably don’t use your radar often and feel much more comfortable using NEXRAD when it comes to navigating through the springtime thunderstorm season each year.

My goal in writing this article on basic radar usage is to get your attention, arm you with enough information to start effectively using your radar, and encourage you to keep learning how to use your radar. It’s possibly one of the most valuable tools in your aviation arsenal, and my hope is that you come to trust and rely on it as much as I do.

NEXRAD versus Radar

The first question we need to ask is, why do we need on-board radar at all if we have a NEXRAD weather product available in the cockpit? Sure, NEXRAD is easy to read and packaged up nicely so anyone can interpret where the weather dangers are, right? Well yes, and mostly NO! Yes, it’s easy to read, but it doesn’t tell you where the storms are, it only tells you where they used to be. You need to understand that, based on the way these images are created on the ground beforehand, the data on your screen is actually older than what it says, by as much as 15 to 20 minutes!

Have a look at these two images I took this spring, one of my NEXRAD (on the left), and the other of my radar (on the right), both taken within a few seconds of each other as I was planning to land at KOJC.

Quite a different perspective, wouldn’t you say? If I had decided to fly a heading directly toward KOJC (my airport destination), the NEXRAD image indicated, “Come on over, the coast is clear.” But the radar image was screaming, “Steer clear, a thunderstorm just popped up in front of you!” Because I was using the radar, I flew around the...
dangerous weather and approach my airport from the south. As you can see, a lot can happen in 15 to 20 minutes, and the real-time nature of your on-board radar is vital to making tactical navigation decisions when the weather is changing around you.

Why Don’t We Use Our Radars?

So if NEXRAD is delayed, and radar is truly real-time, why don’t more pilots use their radar? Maybe because NEXRAD is easy to read and our radar systems are simply mysterious to us. The manual for your radar reads like college physics and geometry textbooks, and you get all kinds of different results as you turn the different dials.

Why so many controls: STBY, BRG, TILT, GAIN, GND, Stabilizer, Vertical Profile, and others? It seems like an engineering degree is required to use these things!

A lot of papers and instructional manuals have been written on how to “operate” radar systems, but not enough information is available on how to “use” the radar. It is easy to turn on NEXRAD and watch the screen fill up with safe greens, cautious yellows, and dangerous reds and purples.

The primary reason that NEXRAD is so easy to read, even if it is dangerously delayed, is that the images are created using a ground-based radar network. The NEXRAD Doppler radar beams are sent from the ground up into the sky, so there is no chance for confusing “ground returns” to show up in the final images. Your on-board radar system, however, generally must deal with ground returns because, most of the time, at least part of
your radar beam is hitting the earth as you operate it from the sky.
If on-board radar systems could somehow ignore ground returns, and only return weather related depictions in our path, then your radar display would look much more like a NEXRAD display, and it would be in real-time. Wouldn’t that be awesome?
Using your radar will never be as easy as using NEXRAD. But with knowledge and a little practice, you can learn to be an ace pilot when it comes to your on-board radar.

The 7,000-foot Convective Hotspot

The key to using your radar is simply knowing “what” to look for and “where” to look for it. Your radar beam is like a flashlight beam, spreading out from the front of your airplane in a cone shape, sweeping left and right. What you are looking for are storms that are brewing. Where you need to look is where storms begin and end, and more precisely, you need to know where in the vertical dimension to look.

Convective storms, regardless of what stage they are in, will nearly always show up between 18,000 feet and 25,000 feet. This is where a thunderstorm’s wind and water are either going up or down, and where the moisture (i.e. large rain drops) is the most reflective from your radar beam’s energy.

If your radar beam can be confidently pointed at the vertical slice of sky in front of you that captures this 7,000-foot hotspot, then you are going to see all you need to see. It really is that easy. If we are flying anywhere below 18,000 feet, then we need to be looking UP for the convective area above us. If we are flying at or above that level, we need to be looking OUT or DOWN at that same 7,000-foot window. Point your radar beam at this hotspot for convective storms, and you’ll see what you need to see on your radar screen.

Three Zones, Same Plan

I like to think about three unique “radar usage zones:” The LOOK UP zone, the LOOK OUT zone, and the LOOK DOWN zone. Let’s briefly cover each of these in turn. As we do, you can feel free to ignore most of your radar controls except for TILT. The TILT knob should be the only control you need to worry about until you have more experience and confidence in using your radar.

In the LOOK UP zone, we might be taxiing, departing for our destination, or arriving at the end of our trip. In all cases, we are within a few thousand feet of the ground, and any convective weather dangers are above us. You need to TILT your radar beam up to see the dangers above, the dangers that are waiting to come crashing down on your head. Right after takeoff, start by TILTING your radar as high as it will go, typically +15 degrees, and then slowly adjust the TILT to between +3 or +5 degrees as you
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approach 10,000 feet. This should give you a good idea of the stuff above you, looking out for the next 10 to 40 miles. Any returns that show up as red or magenta should be avoided at all cost. From this low-altitude vantage point, your radar returns will look a lot like your NEXRAD display because you won’t have any ground returns on the display. Stuff you see on the screen that looks like a storm IS A STORM and should be given the respect it deserves. Avoid it by a healthy margin. Don’t try to look out any further than 40 miles in front of you in this zone, and plan to make tactical heading changes to circumnavigate storm cells in the 10 to 30 miles immediately in front of you.

Once you have climbed up above 10,000 feet, you are now in the LOOK OUT zone and in the same altitude range as the core of any thunderstorms in front of you. In this zone, you will now have to start dealing with “ground returns,” which can obscure any weather depictions in the same area over the ground. This is where science leads to art, and where you need to learn to TILT your radar until you can distinguish between the ground and dangerous weather.

Generally, you will want to see a clear line of ground returns about halfway up your radar screen. Therefore, TILT your radar until the front (or bottom) half of your display is mostly black, and there is a ring of mostly green starting after that. Storm cells will still be yellow, red, and magenta farther past the black area, and will appear to blend in with the ground returns at times, but they will also continue to “march toward” your position and into the black zone if they are above the ground. As a rough guideline, your TILT angle will be around +3 to +5 degrees up near the 10,000 feet lower end of this zone. As you climb higher toward FL250, your TILT angle will be between 0 and +2 degrees up. Keep your radar range on 80 miles in this zone until you need to make tactical heading changes, and then focus on the next 30 to 60 miles in front of you for maneuvering.

The LOOK DOWN zone is similar to the LOOK OUT zone, but as you climb higher, your TILT angle will begin to have a more pronounced downward pitch, as much as -2 degrees down. In this zone, you can also look a little further out for exceptionally tall storms, often as far as 120 miles or more. As you continue to TILT your radar down, ground returns become even more pronounced, but you can adjust your TILT up and down until you can clearly see any weather dangers as distinct from ground returns. In this zone, cities will start to reflect back and look like big storms on your radar, but they won’t “march towards you” into the black half of your screen, they will disappear long before that. Cities will also look more like wide rectangular returns and not so much like the typical oval returns of large thunderstorms. I can assure you that eventually you will become proficient at distinguishing between earth-based objects and actual storms.

**Final Thoughts**

Convective activity can be extremely dangerous to your safety in flight, so you need
to be able to identify storms and avoid them. NEXRAD is a great tool that gives you a big picture view of area weather systems, but it should never be used to tactically maneuver around storm cells. That’s where you radar system really shines.

While you are flying in and around weather, switch back and forth between your NEXRAD display and your radar display. Adjust your TILT up or down until your radar display maps visually to what your NEXRAD display is indicating. Once you have “mapped” these two views of the weather in front of you, rely mainly on your radar display for all short-range tactical heading changes. Use ATC as a third source of information to make sure what you see on your radar is an accurate depiction of the dangers in front of you.

Always avoid any red and magenta radar returns that look like storms, especially if you are in IMC conditions. Unless you can see a clear outline of a storm through the windshield and know with absolute confidence that you can fly over it, trust your radar screen and fly around the red and magenta returns by at least 20 miles.

Practice on clear days finding and identifying your ground returns. Practice “painting storms” when you fly by them, even if they aren’t in your path. Practice over water, finding islands and shorelines. Practice, practice, and then practice some more.

It should be noted that the TILT angle guidelines contained in this article are just that, guidelines. You should practice until you find the TILT positions that work best for your installation. Your dish size, radome condition, avionics and radar manufacturers, and specific airframe installation can all affect the radar returns you see at different TILT angles in your airplane. The general strategy, however, of looking UP, OUT, and DOWN for weather in the CONVECTIVE HOTSPOT vertical region will hold true in all cases.

If you made it this far in the article, then I hope you are excited to take your newfound knowledge with you on your next flight. We have only scratched the surface and there is so much more to learn. We didn’t cover dish size (10-inch, 12-inch, or 24-inch) and the corresponding beam-angle size (10 degrees, 8 degrees, 4 degrees, etc.), and we didn’t talk about GAIN, GRND MAP mode,
Vertical Profile Mode, and the BRG selector. The learning has only just started, but you should now be armed with enough information to begin using your radar effectively.

I would like to give a shout-out to two individuals in particular, Archie Trammell and Erik Eliel, that have contributed a lot of information on radar usage to the pilot community.

Archie and Erik are the “go-to” experts for airborne radar usage, and you can find their references and links at the end of this article. We didn’t have enough time with this article to teach you the many important details that you can learn from them. If you understand the basic principles presented in this article, however, then take the next step and get Archie’s advanced radar course and look for an opportunity to attend one of Erik’s interactive radar seminars. Just like when you first got your private pilot license, you aren’t really done now; the learning has just begun! ⚠️ MMOPA

Additional resources for in-depth radar use:

**Erik Eliel’s website:**
http://www.rtiradar.com/index.htm

**Archie Trammell’s website:**
www.radar4pilots.com

**Editor’s note:** This article first appeared in Twin & Turbine Magazine and is reprinted with permission.

An ATP-rated pilot, Joe Ratterman formerly owned a Piper Meridian and now flies a Pilatus PC-12. Joe retired from a successful corporate executive career in 2015 and now flies as a professional charter pilot for an Overland Park, Kansas-based FBO. He is also the current board chairman/president for Angel Flight Central.
2018 MMOPA Master Aviator

Award Application

Name: ___________________________________________  Today’s Date:  _____________________________

Mailing Address: ________________________________________________________________________________

City: ________________________________________________  State: ________________________  Zip:  ___________

Email: ___________________________________________  Phone:  ___________________________________________

☐ PA46 PIC hours: I verify that I have logged (check one):
   ____ 100  ____  200  ____  300+
   TOTAL PA46 PIC hours from 5/1/18 to 4/30/19:  __________

☐ I verify that I completed an annual insurance-approved recurrent training event with an MMOPA approved training
   provider on the following date between May 1, 2018 and April 30, 2019. (Please provide a copy of the completion
   certificate or evidence of endorsement.)
   DATE:  ____________________________

☐ I also verify that I completed a mid-year training event with a MMOPA approved training provider within the
   past 36 months of the date of this application. (Please provide a copy of the completion certificate or evidence
   of endorsement.)
   DATE:  ____________________________

☐ I verify that I have attended an MMOPA Convention within the last three years.
   Year of convention attended:  __________

☐ I certify that I have had no accidents or incidents within the last three years.

To be recognized and receive the “Senior Aviator” or “Master Aviator” award:
   ☐ Describe and provide proof of completion of an upset/recovery stall/spin training event you have completed.
     Description:
     __________________________________________________________________________________________
     __________________________________________________________________________________________
     Date of training  _________________

☐ Provide proof of a tailwheel endorsement.
   Date of training  _________________

Master Aviator Retention
To retain the honor of being at the highest level of the Master Aviator program, you must have flown 100 hours in the PA46
between May 1, 2018 and April 30, 2019. In addition, you must have completed an additional training or rating achievement
event, including:

New rating:
☐ Commercial  ☐ ATP  ☐ CFI  ☐ Rotorcraft  ☐ Seaplane  ☐ Glider  ☐ Other
Other:
☐ Altitude chamber training  ☐ Mountain/backcountry training
☐ NBAA Single-Pilot Safety Standdown  ☐ Survival/dunk tank course
☐ Aerobatic  ☐ Warbird training
☐ MMOPA mid-year training event  ☐ Any military aviation course/event

Please provide a copy/copies of completion certificate(s).
Date of training:  _____________________

Please select how you would like to be awarded the Master Aviator wings award:
   ☐ I will be registering for the 2019 Annual Convention and would like to receive the award at the convention.
   ☐ I would like the award mailed to me at the address noted above.
I certify that the information contained on this form is correct.
_________________________________________________________________
Signature

If you have any questions about your individual training, please send an email to safety@mmopa.com. We can evaluate any
training (completed or proposed) to determine if it aligns with the award criteria. All applications must be submitted to
safety@mmopa.com by May 1, 2019.
After Hurricane Irma forced the cancellation of the 2017 Convention, MMOPA regrouped and committed to putting together an outstanding event for 2018. The result was one of the most well-attended and most well-received conventions in recent memory. Held at The Broadmoor in Colorado Springs, Colorado, the 2018 event hosted approximately 400 members, companions, sponsors, exhibitors and guests. At the Colorado Springs airport, host FBO Cutter Aviation had 109 PA46 aircraft parked on its ramp.

More than a third of the attendees were first-timers, and the convention hosted members from all over North America – from Alaska to Quebec and throughout the Lower 48. Heiko Lodes, from Regensburg, Germany, took the honor of traveling the furthest.

With MMOPA President Randy James unable to attend due to illness, Executive Director Dianne White and Past President & current Ombudsman Jon Sisk kicked off the convention Thursday morning with a welcome and recognition of sponsors, exhibitors and convention organizer Bill Alberts.

First up, Piper CEO Simon Caldecott provided an update on the company’s financial performance, deliveries and current projects as it relates to the M-Class product line.
Among the highlights:

• Piper is investing facilities upgrades as well as exploring new manufacturing technologies, including 3-D printing;

• Piper will deliver integrated checklists for all M350, M500 and M600 by yearend at no charge;

• Garmin has agreed to undertake the STC for NXi solution for the first G1000 aircraft, the M500, which will be available in 2019;

• Service Bulletin 1332 for the M600 was announced, which replaces rivets in the forward pressure bulkhead. The company is providing two additional years of warranty for those affected;

• The Aviall parts contract expires next year. Piper is considering other vendors;

• A question regarding windshield replacement costs and functionality testing resulted in MMOPA offering to survey its members regarding their experiences.

The Fred Hyman Memorial Lecture featuring NTSB investigator Roger Cox discussed loss of control accidents and why they continue to occur. Among the reasons he suggested are underestimating the threat, ineffective recurrent training and failure to recognize indicators that a LOC event is imminent. He recommended to the audience to address the problem head-on with training, understanding our individual cognitive limitations and
putting the highest priority on the biggest threat to LOC during various phases of flight.

David Purvis presentation on the “Flying Hierarchy of Needs” delved into the four stages of learning and how pilots should strive to elevate above rote learning to develop a deeper knowledge base, skillset and correlative understanding that will translate into safer piloting.

Greg Wroclawski and his spouse Dr. Pamela Alberto riveted the audience with their story about two separate engine-out incidents and what they learned from each. Pam shared the importance of her role in the cockpit in monitoring engine gauges, watching for traffic and confirming fuel, gear and speeds.

Garmin’s Chris Bauer presented an update of current programs available, such as the G500/600 TXi, and those that are in development, including G1000 NXi for the M500 for 2019, and GFC600 (schedule to be determined).

That evening, members took in the break-taking views of the eastern plains and surrounding mountains from deck of the Cheyenne Lodge while enjoying great buffet and drinks.

On Friday, Oct. 5, Safety Committee members Bart Bartlett and Joe Casey kicked off the morning with safety presentations. Bart described the Proficiency Assessment Review, its purpose and how owners can use it to evaluate and improve their skills throughout the entire spectrum of operation.

Joe Casey outlined the Master Aviator Program in detail and previewed the upcoming Operational Practices that will soon be available.

Other presentations on Friday included care and maintenance of de-ice boots, a discussion of avionics developments by Sun Aviation’s Al Rice and an entertaining and informative look at flying to Cuba, Guatemala and the Bahamas by Board Member Paul Himes.

Bill Panarello presented a fast-paced and information-packed session on weather analysis for flight planning. After the session, attendees understood how to use the lifted index chart and the graphical turbulence guidance plots, as well as a number of other tools found on the aviationweather.gov and the 1800wxbrief.com websites.

There were also breakout roundtable meetings for Malibu, Mirage/M350, Meridian/M500/M600 and JetPROP owners.

That evening, the annual dinner and auction took place at The Broadmoor. Past President Manny Casiano was honored with the President’s Award, which was presented by Jon Sisk on behalf of Randy James. The Award was established by the Board to recognize an individual or group for their significant contributions to the education of members and the safe operation of the PA46 fleet. Manny has delivered the Safety Review at the convention every year since 2006 with the goal of imparting knowledge that will lead to zero PA46 accidents.

Winners of the MMOPA Golf Tournament, held the Wednesday just prior to the convention start, were also recognized. Member Ryan Oltman and his wife
Kathy Oltman organized the tournament. Despite a challenging course, the group had a competitive match and excellent weather. Don Kukla took home first place honors with Kathy Oltman coming in second. Tournament sponsor Garmin awarded Don a D2 Delta aviation watch for his winning adjusted score of 74.

Following dinner, Bill Alberts kicked off the auction to benefit the MMOPA Safety & Education Foundation. Members contributed more than $50,000 to fund safety programming and initiatives, while walking away with some unique items, vacations and services. A heartfelt thank you to all companies and individuals who donated items for the auction.

On the final day of the convention, ForeFlight provided a review of some of their new featured, including synthetic vision, route advisor and trip assistant, which will calculate door-to-door travel time. ForeFlight can now send fuel orders to FBOs and has new ADS-B weather layers. Finally, the company reviewed pre-departure clearances and D-ATIS, which eliminates the need to call clearance delivery. This service is only available at 76 airports around the country.

The rest of the day was rounded out by a thought-provoking safety talk from Capt. John Cox and a fascinating look back on the Apollo lunar landings by Jerry Trachtman. Pratt & Whitney Canada provided a PT6 update and Joe Lechtanski reviewed some important pointers on mountain flying.

Manny Casiano presented one of the most anticipated sessions on the PA46 safety record. He reviewed details of the most recent accidents and revealed accident trends, which have moved in a positive direction over the last several years.

The final session of the convention was the Membership Meeting presented by Dianne White, Jon Sisk and Treasurer and Board Member Dave Bennett. With several board member terms ending in 2019, it was requested that members submit Board nominations to the Executive Director for consideration at the first quarter board meeting. It is anticipated that a slate of board nominations will be presented to the membership for a vote at the spring convention May 29-June 1.

MMOPA would like to thank its sponsors and exhibitors who helped make this year’s convention a resounding success.

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