

Training PA46 Pilots: A 5 Step Practical Model Which Will Improve Flight Safety

by

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In spite of insurance mandated training, the accident rate for the PA46 Malibu, Mirage and Meridian remains higher than that of other comparable aircraft in the general aviation fleet¹. The FAA, NTSB and the AOPA Air Safety Foundation agree that the PA46 is a good and capable aircraft, and that these accidents suggest a deficiency in pilot training². In this white paper, you will learn about a model for training pilots which will improve the safety record of the PA46 aircraft.

The PA46 Malibu, Mirage and more recently the Meridian enjoy a rich history. Since its introduction in 1983 this aircraft has enjoyed a world-wide reputation as the pinnacle of personal aviation. There were, however, a number of fatal accidents beginning late in 1989 which drew special attention from the FAA. The aircraft design was completely exonerated by an exhaustive review by the NTSB, Piper Aircraft, and The FAA. The following words summarize the findings of the NTSB in the 1994 special investigation of the Piper PA46: *“As revealed by the investigation of the accidents, we believe that the area of most concern in operating the PA-46 and other similar airplanes is the adequacy of initial and recurrent training received by the pilots.”*³

The NTSB and FAA recommendations were embraced by the manufacturer and the insurance industry; however, implementation was largely left to the training community. Since the Malibu, Mirage and Meridian are perceived to be like larger, professionally flown aircraft, and since the professional pilot community enjoys a far lower accident rate, the pilot training programs for the PA46 were originally structured as they are for professional pilots.

Unfortunately, the accident rate remains unchanged.⁴ Personal flying represents less than 50% of all general aviation flying, yet the personal flying segment of General Aviation is

¹ AOPA Air Safety Foundation (1994) “Safety Review, Piper Malibu/Mirage” p 1-4

² AOPA Air Safety Foundation (1994) “Safety Review, Piper Malibu/Mirage” p 1-11, 3-33, 3-34

³ NTSB Piper PA-46 Special Investigation and FAA Certification Review. Retrieved January 11, 2009 from http://www.nts.gov/Recs/letters/1992/A92_84_89.pdf

⁴ 1997 Nall Report. Retrieved January 11, 2009 from <http://www.aopa.org/asf/publications/97nall.pdf>

responsible for over 80% of the fatal accidents.⁵ These accidents are largely (over 80%) pilot error, not system failure.⁶

The insurance industry has been very effective in mandating training for the PA46 beyond the minimum FAA standard; however, the owner-pilot remains a moving target in this regard. Pilot training is additionally challenged by fast paced changes in avionics in new and used aircraft. These new levels of avionics performance can dramatically increase pilot situational awareness when paired with proper aircraft specific-training.

The classroom lecture/aircraft simulator model which is used to train professional pilots continues to be used to train PA46 owner-pilots. The latest accident data clearly indicates that this model is not adequate.⁷ According to the owner-pilots themselves, there are many reasons for this. Here are the most frequent observations:

- Owner-pilots arrive for training unevaluated and underprepared.
- We call them simulators; however, there are no FAA approved simulators available for the PA46, only flight training devices (FTDs) which may not represent the owner-pilot's aircraft.⁸
- The FTDs are sometimes not functioning properly, too sensitive, or not available as promised.
- Owner-pilots frequently lack the requisite experience to transfer FTD drills into effective pilot skills.
- Many flight instructors lack adequate time in type experience because the rate of turnover is high. Some do not even meet insurance contract open pilot minimum requirements; therefore, training organizations are forced to rely on the FTD as a primary learning tool.
- In some cases, the training is done incorrectly and/or incompletely.

⁵ 2006 Nall Report. Retrieved January 11, 2009 from <http://www.aopa.org/asf/publications/06nall.pdf>

⁶ Ibid.

⁷ 2006 Nall Report. Retrieved January 11, 2009 from <http://www.aopa.org/asf/publications/06nall.pdf>

⁸ FAA List of Qualified Simulators. Retrieved January 11, 2009 from http://www.faa.gov/safety/programs_initiatives/aircraft_aviation/nsp/train_devices/media/All_FSTD.pdf

- There is little or no verification or follow-up.

Owner-pilots are fundamentally different from professional pilots because:

- Owner-pilots fly less frequently and have less overall experience.
- Owner-pilots fly to a greater variety of destinations.
- Owner-pilots typically operate in the single pilot environment.
- Owner-pilots are motivated differently because flying is a part-time avocation.
- Owner-pilots learn differently because they come from a diverse background of age, education, training and experience.⁹
- Owner-pilots have significantly more pilot error related accidents.¹⁰

It is time to acknowledge these special circumstances, apply the training techniques proven to provide results, and apply them to the owner-pilot community.

“Practice does not make perfect. Only perfect practice makes perfect.”¹¹

Psychologists, sports trainers, coaches and the military all agree; effective skills training requires specificity and iteration.¹² Owner-pilots will benefit from decentralized, performance based training which emphasizes the specificity of their particular environment and aircraft. The training should be structured to meet the requirements of an insurance industry verified custom training plan which is paced to maximize learning for the individual owner-pilot.¹³

⁹How people learn: Brain, Mind, Experience, and School By John Bransford, Ann L. Brown, Commission on Behavioral and Social Sciences and Education, Rodney R. Cocking, National Research Council (U. S.) Committee on Developments in the Science of Learning (COR), National Research Council (U. S.) Committee on Learning Research and Educational Practice Retrieved January 11, 2009 <http://books.google.com/books?id=B2h3iaDkUo8C&printsec=frontcover#PPA5,M1>

¹⁰ 2006 Nall Report. Retrieved January 11, 2009 <http://www.aopa.org/asf/publications/06nall.pdf>

¹¹ Vince Lombardi. Retrieved January 11, 2009 <http://www.brainyquote.com/quotes/quotes/v/vincelomba138158.html>

¹² Philip M. Myers, Brent Watson, Molly Watson. “Effective training programs using instructional systems design and e-learning”. Retrieved January 11, 2009 from

<http://www3.interscience.wiley.com/journal/117863239/abstract?CRETRY=1&SRETRY=0>

¹³ Clark, Donald, Retrieved January 11, 2009 from <http://www.nwlink.com/~donclark/hrd/sat.html>

A key foundation in this endeavor is the ADDIE 5 step model which was developed by the US Military in 1975. Since then, ADDIE has become the primary process used by instructional systems designers and training developers. These five phases represent a dynamic, flexible guideline for building effective training and performance support tools:¹⁴

- *Analyze* the performance environment in order to understand it, and then describe the goals needed in order to correct any performance deficiencies (identify training requirements).
- *Design* a process to achieve your goals, that is, correct the performance deficiencies.
- *Develop* your initial discoveries and process them into a product that will assist the learners to become performers (in training, this product is often called an action plan or training plan).
- *Implement* by delivering the elements of the action plan to the learners.
- *Evaluate* the performers, action plan, and audit-trail throughout the four phases and in the working environment to ensure it is achieving the desired results.

When applied to the PA46 training environment, this model will:

- Properly evaluate each owner-pilot prior to the start of training.
- Provide the methodology for a custom training plan for each pilot.
- Allow for skill building iteration of proper procedures through timely and effective application of the proper learning tools.
- Provide for an accurate, consensus-based evaluation and a custom follow-up plan which will ensure continued improvement.

Effective PA46 training is conducted in these five phases by qualified instructors with significant make/model experience and careful supervision from a Senior Certified Flight Instructor (Senior CFI).

¹⁴ The ADDIE Model of instructional systems design (ISD) theory. Retrieved January 11, 2009 from http://en.wikipedia.org/wiki/ADDIE_Model

Phase I – Pilot Assessment – A Senior Certified Flight Instructor uses a validated diagnostic tool (a pilot assessment survey completed by the owner-pilot) to evaluate the owner-pilot's background, experience and training needs. The Senior CFI scores the survey using a validated proprietary formula. A reliable and realistic estimate of training requirements is produced. Concurrence from the owner-pilot leads to Phase II.

Phase II – Training Plan Design – The Senior CFI designs a custom training plan for the owner-pilot, and with the owner-pilot's concurrence, forwards it to the designated insurance broker for inclusion in the insurance RFQ. This will give the underwriter an opportunity to provide more competitive quotes and clear up any doubts about what training will be provided.

Phase III - Development - The training plan design will be used to populate the training course outline on a realistic time line with consideration for the individual pilot's needs. At a minimum it will include:

- Aircraft systems presentations
- Expanded walk-around and aircraft familiarization
- Cockpit procedures training (CPT) (aircraft-based)
- Pitch/Power/Configuration (PPC) familiarization drills (VFR and IFR)
- Remedial instrument training (aircraft or FTD based as needed)
- Scenario Based Training (SBT), including abnormal and emergency operations (aircraft-based)
- Line Oriented Flight Training (LOFT) (aircraft-based)
- Initial Operating Experience (IOE) (aircraft-based as needed)
- Supervised solo (aircraft-based as needed)

In order to provide the specificity required for efficient learning, the primary methodology is aircraft-based training, however, FTD sessions may also be used as needed. Owner-pilots are able to commit to training with greater confidence and a higher level of motivation.

Phase IV – Integrated Ground and Flight Training – Performance based, modular blocks of training are presented in a specific sequence in accordance with the pre-approved custom training plan. The correct information is provided in a logical, evenly paced manner by a qualified instructor with emphasis on correct and consistent procedure. Benchmarks are noted, and the owner-pilot is aware of his or her progress through the use of briefings and debriefings around each block of instruction.

Phase V – Evaluation, Remediation, Certification and Follow-up – Each pilot receives a summary evaluation of his or her performance with respect to FAA standards mandated in the approved training plan. A final diagnostic tool is used to verify that the owner operator has a realistic self-image with respect to pilot skills and has set the appropriate personal limits. Remedial training, if needed, is agreed upon and completed prior to certification. A follow-up plan is derived which may involve supervised solo and/or additional blocks of instruction over a prescribed period of time. This is often done to accommodate low survey score, weather (or lack thereof) during the training cycle, new avionics installation, or as follow-up to supervised solo. An interval of two to five months is agreed upon and set for re-contact in order to plan and schedule the next training session.

The PA46 training community will recruit, prepare and provide training cadre with the following qualifications & performance capabilities, as needed to meet the demand for training:

PA46 Certified Flight Instructor (CFI):

Note: This level of certification is authorized to provide Phase IV and V of PA46 recurrent training only under the supervision of a Senior CFI.

- CFI-I SEL rated and current
- 2000 PIC total time
- 1000 PIC hours airplane, single engine land
- 1000 hours flight instruction given
- 200 PIC hours in the pressurized flight environment or have completed the USAF physiology training
- 200 hours PIC PA46 make and model
- 50 hours PIC in PA46 aircraft in the last 12 months or have completed a PA46 Instructor Development Course (IDC) within the last 6 months
- Use an FAA Industry Training Standards (FITS) approved training syllabus via license with direct supervision from a Senior CFI
- Use validated diagnostics for pre and post training analysis and verification via license with direct supervision from a Senior CFI
- Complete an industry provided PA46 Instructor Development Course each 12 months from the syllabus and diagnostic tool licensor.
- Complete PA46 initial or recurrent training with a PA46 Senior CFI each 12 month period (PA46 piston and PA46 turbine programs may be given in alternate years).
- Maintain a minimum of \$1M flight instructor liability insurance applicable to PA46

PA46 Senior Certified Flight Instructor (Senior CFI):

- ATP; CFI-I SEL rated and current
- 3000 PIC total time
- 2000 PIC hours airplane single engine land
- 2000 PIC hours in the pressurized flight environment or have completed USAF physiology training within the last 12 months
- 2000 hours flight instruction given
- 1000 hours PIC PA46 make and model
- 150 hours PIC in PA46 aircraft in the last 12 months or PA46 Instructor Development Course (IDC) within the last 12 months
- Maintain and use an FAA Industry Training Standards (FITS) approved training syllabus via original certification or license
- Maintain and use validated diagnostics for pre and post training analysis and verification via original certification or license
- Complete an industry provided PA46 Instructor Development Course each 24 months from the syllabus and diagnostic tool licenser or remain Master Certified Flight Instructor current through The National Association of Flight Instructors
- Complete PA46 initial or recurrent training with a PA46 CFI or Senior CFI each 12 month period (PA46 piston and PA46 turbine programs may be given in alternate years).
- Maintain a minimum of \$1M flight instructor liability insurance applicable to PA46

PA46 Course Director:

- ATP, CFI-I SEL rated and current or Commercial SEL and hold at least 1 turbojet type rating
- 5000 PIC total time
- 4000 hours flight instruction given
- 3000 PIC hours Airplane Single engine land
- 3000 PIC hours in the pressurized flight environment or have completed USAF physiology training
- 3000 hours PIC PA46 Make and Model
- Have served as a PA46 Senior CFI for a minimum of two years
- Provide Course Development and Instructor Development Training Programs to qualified industry members under license
- Provide approved syllabi and diagnostic tools to Senior CFIs under license

Soon, the PA-47 Piper Jet will be added to the mix. Pilot training for all of the PA46 & PA47 aircraft should be customized and structured for each owner-pilot and his or her specific aircraft. While this method is not difficult or expensive, it is a departure from the past, and a paradigm shift is needed. It will take cooperation from the underwriter community, the training industry, and the manufacturer's sales and marketing network.

You can help improve the safety of the PA46 aircraft. Call 410-435-3333 or send an email to mail@rwrpilottraining.com to find out how.

Additional information is available at www.rwrpilottraining.com

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About the Author

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A former corporate pilot and primary flight instructor, Dick Rochfort is a full-time Master Certified Flight Instructor providing insurance approved initial and recurrent pilot training exclusively in the Piper PA46 Malibu, Mirage, and Meridian aircraft. He currently trains 60-80 pilots every year exclusively in these aircraft.

He holds multi-engine ATP and Gold Seal Flight Instructor Certificates with CFII, MEI and CE-525S ratings. He has been actively involved in flight training since 1991 and has trained pilots all over the US, Canada and Europe.

Dick is an Aviation Safety Counselor for the FAA Baltimore Flight Standards District Office, a National Industry Member of the FAA Safety Team (FAAST) and has conducted hundreds of programs for the pilot community. He is an instructor for the MMOPA Safety and Training Foundation and the National Association of Flight Instructors has designated him [Master CFI](#). Less than 1% of all flight instructors have earned this designation.

Dick served as a “Green Beret” Staff Sergeant E6 in the [US Army Special Forces](#) from 1970 until 1976 as an A team radio operator, training indigenous personnel in field communications. He worked from 1976 until 1991 as an industrial engineer training manufacturing personnel for the production of communication and navigation equipment for the US military.

His education includes undergraduate degrees in Clinical Psychology and Engineering and a Masters Degree in Business Administration. Dick lives in Baltimore, Maryland with his wife and has two daughters. He is a PADI (Professional Association of Diving Instructors) Certified Scuba Diving Instructor, a DAN (Divers Alert Network) First Aid Instructor and an Eagle Scout.
