

Flight Advisor Corner by Hobie Tomlinson

June 2013

Flying Multi-Engine Aircraft (Pt. XII)

AMEL PTS 3

As we continue our series on flying FAR Part 23 (CFR 14, Chapter 1, Subchapter C, and Part 23) certified, small multi-engine airplanes, we are looking at the training issues involved in completing a multi-engine transition course.

This month we will return to our discussion of the items involved in a **Multi-Engine Transition Course** as we continue working our way through the Multiengine Practical Test Standards (PTS) FAA-S-8081-12C (Commercial Pilot for Airplane Single- and Multi-Engine Land and Sea) that became effective on June 1, 2012.

The Six-Cylinder Twins – Piper PA23-250 “Aztec”



Toronto City Airport

Wikipedia Image

We resume our discussion with the Commercial Pilot – Airplane Practical Test Prerequisites imbedded in the Introduction Section of the PTS.

Commercial Pilot – Airplane Practical Test Prerequisites required of an AME practical test applicant at the Commercial Pilot level are specified by 14 CFR part 61 and are as follows:

- ✓ At least 18 years old.
- ✓ Able to read, speak, write, and understand English (English Proficient).

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- ✓ Possess private pilot certificate with airplane rating (or meet all experience prerequisites and pass all required tests for its issuance).
- ✓ Possess an instrument rating-airplane (or be issued a restricted certificate – “*Carrying passengers in airplanes for hire is prohibited at night or on cross-county flights of more than 50 nautical miles.*” (**Note:** A pilot who holds an ASE rating with instrument privileges must complete the instrument portion of the AME test and is not permitted to test for a “*VFR Only*” AME certificate.)
- ✓ Passed the appropriate commercial pilot knowledge test (within the previous 24 calendar months before taking the practical test).
- ✓ Received and logged Ground and Flight Training from an authorized Instructor on the Areas of Operation listed in 61.127 (repeated in the Commercial Pilot PTS).
- ✓ Obtained the prescribed aeronautical experience.
- ✓ Possess at least a current third class medical certificate (or an up-to-date military medical examination authorizing U.S. Armed Forces pilot status).
- ✓ Receive and log ground training from an authorized instructor (or complete an appropriate home-study course) on the knowledge areas of 14 CFR part 61.125 (b), pertaining to the category and class rating sought.
- ✓ Have an endorsement from an authorized instructor certifying the applicant has received and logged the test preparation training time within two calendar months of the test application date and is prepared for the practical test.
- ✓ Have an endorsement certifying that the applicant has satisfactory knowledge of the subject areas found deficient on the airman knowledge test. (**Note:** A knowledge test is not required when transitioning from a powered aircraft to another powered aircraft of a different category and/or class at the same–or a lower–pilot certificate level.)

Commercial Pilot – Aircraft and Equipment provided by the applicant for the practical test is required to be an airworthy, certificated aircraft as required by 14 CFR part 61.45. Part 61.45 also requires that the furnished aircraft meet the following requirements:

- ✓ U.S., foreign, or military registry of the same category, class (and type – if applicable) for the certificate or rating being sought.
- ✓ Fully functioning dual controls (**Note:** Exceptions are listed in 14 CFR, part 61.45 (c) and (e).
 - 61.45 (c) – Lighter-than-air aircraft and gliders (except motor gliders).

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- 61.45 (e) – aircraft with single controls may be used provided:
 - Examiner agrees to conduct the test.
 - Test does not require demonstration of instrument skills
 - Observer seat is available which positions the examiner adequately to observe the applicant’s proficiency.
 - **Note:** It was very common for Beechcraft to sell their Baron (twin engine) and Bonanza (single engine) aircraft with a single “throw-over” control wheel which could be positioned to either front seat. (The right front seat also had “fold down” rudder pedals.) The “Dual” control yoke configuration was a rather expensive option and many aircraft still exist in the fleet with a single “throw-over” control yoke. Thus the 61.45 (e) exemption was primarily created to allow owner/operators of aircraft in this particular configuration a limited flight testing use.

- ✓ Capable of performing all Areas of Operations appropriate to the rating sought.

- ✓ Have no operating limitations which preclude its use in any required Area of Operations required for the practical test.

- ✓ Be a complex airplane.
 - A complex landplane has retractable gear, flaps and a controllable propeller – or turbine powered.
 - A complex seaplane has flaps and a controllable propeller.
 - When more than one airplane is used for the practical test, the performance of takeoffs, landings, and appropriate emergency procedures must be demonstrated in the complex airplane.
 - **Note:** An applicant who currently holds a commercial pilot certificate with an airplane multi-engine class rating need not furnish a complex airplane for the addition of a single-engine class rating to that certificate (or vice-versa).

The Use of FSTD (Flight Simulation Training Devices) has expanded exponentially with the growth of high-tech in the aviation field. Modern flight training uses many different training devices that range from **Part-Task Trainers (PTTs)** covering one or more aircraft systems (i.e. Avionics – Computer Based Training programs) to **Full Flight Simulators (FFS)** having comprehensive aerodynamic and systems modeling. These devices encompass a wide range of fidelity in physical cockpit characteristics, quality of software models, sound, motion, and visual presentations. The following types of training devices are in common use:

- ✓ **Cockpit Procedures Trainer (CPT)** – is used for cockpit familiarization and practicing basic cockpit procedures, such as normal, abnormal, and emergency checklists. Certain aircraft systems may or may not be simulated. The aerodynamic model is usually extremely generic if even present. CPTs are usually not regulated and are used for simulator preparation during final phase of

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ground school training.

Table-Top Device (TTD) – is a personal computer which has a flight simulation program installed. They may use a standard computer keyboard for pilot inputs or may even incorporate the addition of rudder pedals, a yoke and throttle quadrant modules to make pilot inputs. The visual and aerodynamic models are artificially created and non-regulated. These devices can provide good procedural training, but provide a quite low fidelity aerodynamic model.

- ✓ **Basic Aviation Training Device (BATD)** – is a basic training device that primarily focuses on teaching generic flight procedures utilizing a simple flight model. They typically provide a visual system, but without motion. FAA recognition for *training credit* begins at this level.
- ✓ **Basic Instrument Training Device (BITD)** – is a basic training device that primarily focuses on teaching generic instrument flight procedures and also utilizes a simple flight model. These typically do not provide a visual system.
- ✓ **Aviation Training Device (ATD)** – is used for basic training of flight concepts and procedures. A higher fidelity generic flight model representing a "family" of aircraft is installed, and many common flight systems are simulated. These devices typically have a visual system installed.
- ✓ **Advanced Aviation Training Device (AATD)** is an even higher fidelity ATD that incorporates a visual system and usually includes a basic motion system. (I.e. Redbird simulators are in this category.)
- ✓ **Flight and Navigation Procedures Trainer (FNPT)** – is used for generic flight training. They incorporate a generic, but comprehensive flight model and require that many systems and environmental effects are included.
- ✓ **Integrated Procedures Trainer (IPT)** – provides a fully simulated cockpit mock-up that combines the use of multiple touch-sensitive screens that display simulated aircraft panels in the same size as the actual aircraft panels, including hardware replica panels, and may even incorporate some actual aircraft panels.
- ✓ **Flight Training Device (FTD)** – is used for either generic or aircraft-specific flight training. Comprehensive flight, systems, and environmental models are required to be installed. The higher level FTDs require visual systems but not all the characteristics of a Full Flight Simulator (FFS). FTDs are qualified, and periodically inspected, by the FAA National Simulator Program office that rates them at levels 1 – 7. FAA recognition of *testing credit* begins at FTD level 4.
- ✓ **Full Flight Simulator (FFS)** – is used for aircraft-specific flight training under rules of the appropriate national civil aviation regulatory authority. Under these rules, relevant aircraft systems must be fully simulated, and a comprehensive aerodynamic model is required. All FFSs require Out-The-Window (OTW) real-world, visual systems and a motion platform (3 – 6 axis). FFSs are qualified, and periodically inspected, by the FAA National Simulator Program office that rates

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them at levels A – D.

- ✓ **Full Mission Simulator (FMS)** – Is used by the military to denote a simulator capable of training all aspects of an operational mission in the represented aircraft.

Airman Applicants for the Commercial Pilot – AME rating practical test are authorized to use a FFS (level A – D), or a FTD (level 4 – 7) that has been qualified by the National Simulator Program Office to complete certain flight task requirements (listed in FAA-S-8081-12C, appendix 2). These devices may only be for testing purposes by an approved 14 CFR part 141 pilot school or a 14 CFR part 142 training center in accordance with their approved curriculum. Practical tests, or portions thereof, accomplished in these training devices may only be administered by FAA Aviation Safety Inspectors, Designees authorized to conduct such tests for part 141 school graduates, or appropriately authorized part 142 Training Center Evaluators (TCEs).

Flight Tasks administered in an aircraft sometimes must be accomplished thru “simulated” actions in the interest of safety and practicality; however, when these same tasks are accomplished in a FSTD the actions may not be “simulated” but all Task elements must be actually accomplished as would be expected during the real event. (I.e. A simulated engine fire procedure in an aircraft would be demonstrated by retarding the throttle to idle, then simulating the actions of engine shutdown, fire suppression agent discharge, and disconnection of the associated electrical, hydraulic, and pneumatic systems. Completing this Task in a FSTD requires that these items actually be accomplished.

Safety of Flight precautions taken during aircraft flight testing for specific maneuvers, such as the maximum speed for initiating a rejected takeoff (prior to 50% of calculated V_{mc}); need not be adhered to when one is being tested in a FSTD.

Whether Accomplished in an aircraft or FSTD, all Tasks and elements for each maneuver shall have the same performance standards applied for the determination of overall satisfactory performance. Training devices other than FSTDs may be used **In Accordance With** (IAW) Advisory Circular (AC) 61-136.

An Appropriately Rated Flight Instructor (CFI) has the responsibility for training the applicant to meet the acceptable standards in all subject matter areas, procedures, and maneuvers included in the Tasks imbedded within each Area of Operation (AOA) in the appropriate commercial pilot practical test standard (PTS), even if the applicant is only adding a category and/or class rating. CFIs must exhibit a high degree of knowledge, skill, and teaching ability due to their training impact in the development of safe and proficient pilots. The CFI is also responsible for the applicant’s development of effective visual scanning and collision avoidance techniques, as well as the manufacturer’s recommended operating procedures and any other knowledge or skill areas deemed appropriate to the practical test.

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The Designated Pilot Examiner (DPE), or other authorized examiner, conducting the practical test is responsible for determining that the applicant meets the acceptable knowledge, skill, and performance standards of each required PTS task. Because the PTS has no formal division between the “oral” and “skill” portions of the practical test, this is an ongoing process throughout the test. Oral questions should be used judiciously during the flight portion of the test. Examiners shall test the applicant’s correlative abilities to the greatest extent possible during the practical test, rather than the mere rote recitation of facts. The examiner shall evaluate the applicant’s use of visual scanning and collision avoidance procedures throughout the flight portion of the test.

Examiners are to grade all Tasks on a one-time, first-look basis and are forbidden from giving any instruction, allowing any additional practice, or allowing a repeated attempt to complete any clearly unsatisfactory Tasks; however, in the interest of fairness, the applicant may be allowed to repeat any Tasks that were incomplete – or that have produced an uncertain outcome. When practical, this should occur after the other Tasks have been satisfactorily completed.

When Conducting AME Tests, where the after-liftoff failure of the most critical engine is required, examiners must give consideration to the local atmospheric conditions, departure path, terrain, and the type of aircraft used. The after-liftoff failure of an engine may not be simulated until obtaining at least V_{se} , V_{xse} , or V_{yse} and an altitude of at least 500 feet AGL. During simulated in-flight engine failures, the examiner shall set “zero thrust” after the applicant has simulated feathering the propeller (by moving the correct propeller control one “knob-width” aft). The examiner shall require the actual in-flight feathering of one propeller (at a minimum altitude of at least 3,000 feet AGL), unless the manufacturer specifically prohibits the intentional, non-emergency feathering of a propeller during flight. This demonstration shall occur at a location and altitude which allows a safe emergency return to the airport in the event the propeller cannot be unfeathered in-flight. In addition, examiners must also require the applicant to demonstrate at least one landing with a simulated feathered propeller and the engine set to zero thrust.

Satisfactory Performance to meet certification requirements is based on the applicant’s ability to safely accomplish the following:

- ✓ Perform Tasks specified in the Areas of Operation for the certificate and/or rating sought within the approved standards.
- ✓ Demonstrate mastery of the aircraft by performing each task successfully.
- ✓ Demonstrate satisfactory proficiency and competency within the approved standards.
- ✓ Demonstrate sound judgment and exercise aeronautical decision-making and risk management.
- ✓ Demonstrate single-pilot competence when the aircraft is certified for single-pilot operations.

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An FAA Form 8060-4 (Temporary Airman Certificate) is issued the applicant upon the successful completion of the above listed items.

Unsatisfactory Performance (Grounds for Disqualification) is indicated by the occurrence of any of the following items:

- ✓ Any action or lack of action by the applicant that requires corrective intervention by the examiner to maintain flight safety.
- ✓ Failure to use proper and effective visual scanning techniques to clear the area before and while performing maneuvers.
- ✓ Consistently exceeding the tolerances stated in the Objectives of the PTS.
- ✓ Failure to take prompt corrective action when PTS tolerances are exceeded.

Tolerances listed in the PTS represent the performance expected in good flying conditions. When, in the judgment of the examiner, the applicant does not meet the standards of any task performed, the associated Area of Operation and the practical test is failed and the examiner shall issue the applicant a Notice of Disapproval.

Either the Applicant or the Examiner may discontinue the test whenever the failure of an Area of Operation makes the applicant ineligible for the certificate and/or rating sought. A failed test may be continued **ONLY** with the consent of both the applicant and the examiner. (Continuing the test is always my preference, if the applicant consents. The “second failures” I typically see occur when the applicant elects to discontinue the test, thus leaving undiscovered, unsatisfactory tasks that then show up on the second test attempt.) In either event, the applicant receives credit for all Areas of Operation and their associated Tasks that were satisfactorily performed. This credit, however, does not preclude the subsequent examiner doing a retest from reevaluating any Task, at his discretion, even including those tasks that were previously passed.

When a Notice of Disapproval is issued, the examiner shall record the applicant’s unsatisfactory performance in terms of the Area of Operation and specific Task(s) that did not meet the PTS standards. The Areas of Operation and Tasks not tested as well as the number of practical test failures shall also be recorded. If the test is failed due to a special emphasis area, the Area of Operation and associated Task in which the failure occurred shall also be recorded. A reexamination must occur within 60 days to receive credit for any successfully completed Tasks, subsequent to that date a full retest will be required.

A Letter of Discontinuance is issued to the applicant whenever a practical test is discontinued for any reason other than unsatisfactory performance. Some events which may lead to a Letter of Discontinuance are unforecast weather, equipment failure, illness, fatigue, impending darkness, or even an occasionally prescheduled, two-part test. When a Letter of Discontinuance is issued, the applicants FAA Form 8710-1 (Airman Certificate and/or Rating Application Form and, if applicable, the Airman Knowledge Test Report are returned to the applicant. The examiner must prepare, sign, and issue a Letter of Discontinuance to the applicant that identifies the Areas of Operation and the

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associate Tasks of the PTS that were successfully completed. The applicant must be advised that the Letter of Discontinuance must be presented to the subsequent examiner in order to receive credit for any completed tasks and that it will be made a part of the final certification file. The continuation of the practical test must occur within 60 days to receive credit for any successfully completed Tasks, subsequent to that date a full test will be required.

The Integrated Airman Certification and Rating Application (IACRA) FAA website is now used to process FAA electronic 8710 forms. Use of this website for completing the required airman application process is usually preferred by examiners. The website catches most application errors and drastically quickens the documentation “turnaround time” in Oklahoma City by the FAA. Although paper applications may still be used, most examiners now dislike using paper applications. Many examiners will even charge an increased application fee to cover the extra work involved in using a paper application.

This appears to be a good place to break for this month. Next month we will pick up our discussion with *Single-Pilot Resource Management (SRM)*, which is imbedded the **Commercial Pilot – Airplane Practical Test Standards Introduction Section**, as we continue working our way through the Multiengine **Practical Test Standards (PTS) FAA-S-8081-12C (Commercial Pilot for Airplane Single- and Multi-Engine Land and Sea)** that became effective on June 1, 2012.

The Thought for this Month: *“Worry does not empty tomorrow of its sorrow; it empties today of its strength.” ~ Corrie ten Boom, Dutch Writer and WWII Concentration Camp Survivor*

So until next month, be sure to *Think Right to FliRite!*

The Six-Cylinder Twins – Beech58 “Baron”



1979 BE-58TC – S/N TK-98

Wikipedia Image