

# FAA/Industry Training Standards

## with special emphasis on Moving Map & Glass Cockpits

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*Do you need an additional 25 hours of training to transition to a glass cockpit?*



*Cessna 182 Panel with Garmin G1000 display units*

The latest generation of glass displays for civil aircraft is creating new challenges for the flight training industry. Garmin describes their new G1000 system as follows (1)

***"The G 1000 system integrates all primary flight, navigation, communication, terrain, traffic, weather, and Engine Instrumentation and Crew Alerting System (EICAS) data on two 10.4-inch, high-definition LCDs in the DA40 Diamond Star. These active-matrix displays feature XGA resolution (1,024x768-pixel count) and are capable of presenting data in brilliant, sunlight-readable color at wide viewing angles.***

- ***The primary flight display (PFD) replaces many of the traditional cockpit instruments and digitally integrates flight information on a single, large-format display for easier interpretation by the pilot. The PFD interfaces with Garmin's new Attitude and Heading Reference System (AHRS), which features rapid alignment while moving, including inflight dynamic restarts.***
- ***The multifunction display (MFD) puts all aircraft-systems monitoring and flight-planning functions at the pilot's fingertips. The MFD paints a composite view of the aircraft's environment, providing the pilot with all necessary information to make safe decisions during every phase of flight. Engine performance and situational data such as location, terrain, traffic, weather and airport information are all digitally depicted and can be quickly interpreted at a glance on the large-format display.***
- ***The integrated design and reversionary capabilities of the G1000 allow all flight-critical data to transfer seamlessly to a single display for added safety and peace of mind during flight.***

(1) Garmin International Inc., +1-913-397-8200, [media.relations@garmin.com](mailto:media.relations@garmin.com)

Pilots who have been fortunate enough to fly with the latest electronic navigation and powerplant control devices on the panels of their aircraft have been on their own when it comes to learning how to use the equipment. They either self-teach, take courses from manufacturers, or find some other way to come up to speed. The modernization of general aviation technology, and its increased presence in the cockpit, hasn't gone unnoticed at the FAA. Bit by bit, technically advanced aircraft (TAA= aircraft generally defined as new or retrofitted older aircraft that combine design features such as advanced cockpit automation systems (e.g. Moving Map/GPS/Glass

Cockpit) for IFR/VFR flight operations, automated engine and systems management, and integrated autoflight/autopilot systems - will be the norm rather than the exception in the general aviation fleet. Some manufacturers, including Piper, Cessna, and Cirrus, routinely offer "glass cockpits" on new models. Both the general aviation industry and the FAA realize that the proliferation of technically advanced aircraft will require new and innovative methods of training and testing pilots. The FAA/Industry Training Standards Program (FITS) was designed to meet this challenge.

## ***Background***

General aviation constitutes a significant majority of aircraft in the United States and performs a variety of critical functions ranging from flight training for most pilots to medical evacuation, small package delivery, fractional ownership, business transportation, agricultural operations, law enforcement, and other functions. Increasingly, general aviation is also providing a viable air transportation complement to the air carrier "hub and spoke" system. Corporate aviation and ondemand air taxis have provided such service for some time and new forms of general aviation are expanding these alternatives.

Many new developments have recently taken place that have a pronounced effect on general aviation flight operations and training. For example, the complexity of the airspace will continue to increase as the National Airspace System (NAS) is modernized and the FAA's Operational Evolution Plan takes effect. Airspace and related operational changes will continue to accommodate national security mandates, and these changes will be magnified as new cockpit and other flight technologies are introduced.

New technologies designed to enhance aircraft operational capabilities are always being developed and brought to market. New time-effective, cost-effective, and innovative ways to train pilots need to be developed that address the potential safety benefits new technologies can bring to general aviation. Older technology systems all function and look similar, so it did not matter who built the systems. However, new technology systems that perform similar functions may not look alike and pilot interaction with these systems may be completely different. Consequently, a "one size fits all" approach to training is no longer adequate.

The FITS Program uses an evolutionary approach to training pilots that is responsive to the pace of changes in the general aviation environment and the NAS. As new technology and aircraft are developed, the FAA will identify future training needs. The FITS Program will develop training products and guidelines that are appropriate to the needs of the general aviation community.

The leading causes of general aviation fatal accidents are related to weather and loss of control. As the general aviation community continues to grow, a major challenge will be to decrease the number of fatal accidents and to maintain, and hopefully increase, public acceptance of general aviation as an alternative form of air travel. Recent evaluations of accidents in Technically Advanced Aircraft and training accidents indicate that lack of situational awareness, poor decision making, and inadequate risk management were major root causes. According to the FAA, general aviation training and testing will be changed to address these leading accident causes and further reduce the number of general aviation fatal accidents. FAA/Industry Training Standards will play a major role in this effort.

## ***FAA/industry Training Standard***

Each new aviation technology that is brought to the market presents the potential for new training needs. The FAA process for developing new or revised advisory materials and rule changes are [doubtless] not fast enough to keep up with these changing needs for training. For this reason, the FAA is teamed with general aviation industry leaders to develop FITS that are acceptable to the FAA. There are currently three categories of FITS products:

**1) Generic FITS for Use by the General Aviation Community as a Whole.** Generic standards will be developed for a broad category of training functions such as the flight review, complex and high performance training, and other functions. Individual training entities may adapt them for a particular aircraft or other

scenarios. Whenever possible, incentive mechanisms will be incorporated into the standards.

**2) Specific FITS Program for a Specific Aircraft or Technology.** Specific FITS are expected to be developed as new aircraft and technologies are developed. For example, a specific FITS might be developed to train a pilot on a specific display or capability the operator has retrofitted into an aircraft. Another specific FITS might be for a specific aircraft type. These training standards may be integrated with the generic standards previously described.

**3) Mandatory FITS Standards in Accordance with CFR 61.31(h) - “Additional Training and Authorization Requirements”** In some instances, the FAA may elect to invoke the FAR's to require aircraft type specific training for aircraft with unusual operating characteristics, flight systems, or critical safety issues. Because of the regulatory implications of FITS, notice and/or public comment would normally be required to implement this provision. Promulgation could be through an amendment to the aircraft flight manual, with reference to FITS.

### ***Voluntary Adoption of FITS***

The FAA is currently working with the general aviation industry to provide incentives for pilots and training operators to adopt and use FITS. Some possible incentives are:

- a) - Lower insurance costs, or more importantly, the availability of insurance if the pilot is trained under an approved FITS Program. One major general aviation oriented insurance carrier has already agreed to a 10 percent discount if a pilot accomplishes FITS recurrent training that includes aeronautical decision making and risk management.
- b) - Other insurance-related cost saving incentives may result from the use of a FITS Program. All insurance carriers require a certain amount of pilot experience in a particular make and model of aircraft to be insured. Typically, if the pilot has little or no experience in the make and model, the insurance carriers require a certain amount of ground and/or flight instruction from an insurance carrier-approved flight instructor. Depending on the experience of the pilot and the make and model of aircraft, an insurance carrier will require an average of 20 to 25 hours of instruction in the make and model with the hope that the pilot receives at least 25 percent of that as valuable "quality" instruction. The FAA will be working with insurance carriers to show them that FITS can substantially reduce the number of required instructional hours by providing 100 percent quality instruction. In other words, according to the FAA, FITS could reduce 25 hours of required make and model instruction down to 5 hours, thus reducing the operator's overall operational costs.
- c) - The FITS team is currently developing a generic private/instrument combined curriculum for use in FAA approved flying schools that operate under FAR Part 141. Under this curriculum, the minimum flight time and experience requirements of FAR Parts 61 and 141 would not apply. Also, there would be no restrictions on the use of simulation devices. Consequently, a pilot would be able to receive a private pilot certificate and instrument rating in less time and with less cost.
- d) - A new way to comply with the flight review requirements of FAR 61.56 is being developed. Preliminary cost analysis indicates that it would cost more than a standard flight review, but less than the current Pilot Proficiency Award (WINGS) Program. Additionally, this new pilot proficiency program is expected to be more convenient. Continuing education modules, that contain updated information on new airspace, new airspace restrictions, or other requirements, can be accomplished whenever and wherever the pilot has time, and more pertinent modules can be tailored to a pilot's type of flying, or the time of year.

### ***Using FITS***

According to the FAA, there are four basic types of pilot training:

- 1) - Initial - A pilot receives a certificate or rating (private, commercial, instrument, multiengine, ATP, etc.);
- 2) - Transition - A pilot goes from one make and model to another or receives an operating privilege (Cirrus SR-

22, Lancair Columbia 400, high performance, complex, tailwheel, etc.);

3) - Recurrent (such as a flight review);

4) - Equipment Specific (such as Garmin 430/530, Avidyne Flight Max EX 500, Bendix/King KILN 90B).

According to the FAA, the FITS technical team is producing generic training syllabi for these types of pilot training. When the syllabi are completed, they will be put on a FITS internet web site. These syllabi will be considered "living documents" and will not be static. After implementation data is collected, validated, and analyzed, the generic FITS syllabi will be modified as needed. It is planned that, in general, the general aviation industry will use a generic FITS and develop specific training curriculums/programs from it. For example:

A new aircraft manufacturer develops a new four-place TAA single-engine airplane. Since they will be conducting their own factory transition training for their customers, they will need a transition training syllabus. They can go to the FITS web site and download the FITS Generic Transition Training syllabus. They use the FITS syllabus as a template or guide to develop an aircraft specific Transition Training Syllabus and submit it to the FITS technical team for review and acceptance as a FITS compliant syllabus. In this case, there would be no FAA Flight Standards District Office or FAA Aviation Safety Inspector involvement.

Another example would be that of an FAA approved flying school which wishes to provide aircraft specific transition training under FAR Part 14 1, appendix K, Special Preparation Courses. The flying school could go to the FITS website and download the FITS Generic TAA Transition Training Syllabus. It could then use the syllabus to develop a transition training curriculum tailored to the specific aircraft. The flying school would then apply to their local FAA Flight Standards District Office for the addition of this curriculum, as they would for any curriculum. The FSDO personnel would handle this request as they would any other request for an additional course.

The FITS program focuses on small (12,500 pounds or less maximum gross takeoff weight) TAA that are either reciprocating or turbine powered and owner or professionally flown for personal or business transportation. Commercial operators (air carriers and charter operators) have stringent training requirements. Operators of two-pilot business jets already have a safety record nearly equal to air carriers. Recreational Pilots (and future Sport Pilots) have their own training and certification standards that restrict them to the airspace in which they can fly and the number of passengers they can carry. This should reduce their exposure to risk. A businessman using a TAA as a transportation tool is an excellent example of where FITS is expected to be concentrated.

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