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Glass evolves

An exclusive first look at the Aspen Avionics EFD1000 PFD

BY IAN J. TWOMBLY

Aspen Avionics, a small start-up company based in Albuquerque, has ambitious plans. And since EAA AirVenture last July, those plans have brought great interest to the general aviation community. The promise of a glass primary flight display for only \$10,000 tends to do that. The expectations are high, and now it's time for the folks at Aspen to deliver. And deliver they have.

Before Aspen's announcement, the idea of retrofitting a certified aircraft with a glass cockpit was practical only for the higher end of the GA market. But things have changed and the company is hoping to do for glass what Garmin did for GPS—bring it to the masses. In fact, it is partially Aspen's



The Aspen Avionics EFD1000 (top) will be the keystone of AOPA's 2008 "Get Your Glass" Sweepstakes Archer (above).

EFD1000 PFD Pro that makes AOPA's "Get Your Glass" sweepstakes possible this year. Although other glass cockpits displays are on the market, the Aspen unit comes in at a price that makes retrofitting a 1976 Piper Archer practical (owners looking to spend less can opt for the \$6,000 Pilot version, which doesn't include navigation information in the lower display).

We recently had the opportunity to be the first ever outside the company to fly the Evolution Flight Display (EFD) 1000, and the results were impressive. At its most basic, the EFD1000 is exactly what it looks like—an electronic version of the attitude indicator and directional gyro found in almost all general aviation aircraft. But it is much more than that. It's a GPS (of sorts), a radio magnetic indicator, an altitude pre-select, a course deviation indicator (CDI), and a horizontal situation indicator (HSI). Above all though, it significantly reduces workload and increases safety.

By now, most pilots are at least vaguely familiar with the electronic flight information system concept. Usually we think of a full glass cockpit as both a primary flight display (PFD) and a multifunction display (MFD). A PFD features an attitude indicator on the top portion and usually an HSI on the bottom. The attitude display is flanked on either side with a set of "tapes" that show airspeed on the left and altitude on the right. A vertical speed indicator is incorporated as well.

But Aspen has taken the basic concept of a PFD and thrown it on its head. Whereas all other PFDs on the market cost tens of thousands of dollars and take up almost the entire left side of the panel, Aspen's EFD1000 fits in the space previously occupied by the attitude indicator and directional gyro. The result is a quick installation—the company is shooting for one week—and room left over for back-up instruments, multifunction displays, or anything else an owner cares want to fit in the limited space of a typical GA panel. The same goes for Aspen's MFD, which



Electronic displays bring safety and workload-reducing features to the cockpit. Lateral and vertical deviation information is shown on the Aspen's top attitude display during an approach (above). The pilot can also set approach minimums as a constant reminder (right).



is expected to be FAA certified by the end of the year. AOPA's "Get Your Glass" Sweepstakes Archer will be wired for the display for the winner.

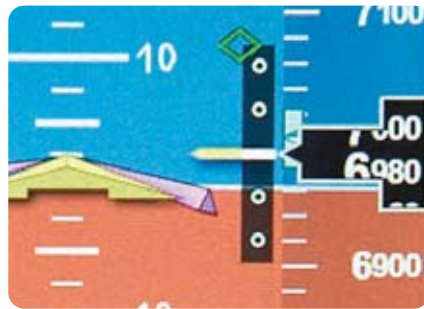
The best features of Aspen's EFD1000 can be placed into two categories—those that reduce workload and those that increase safety. The reduction in workload comes as soon as the master switch is turned on. There are no pre-start or preflight checks, and the attitude and heading reference system (AHRS) comes online quickly. In that respect, the EFD1000 is no more complicated than a standard gyro. All the pilot has to do is set the desired navigation information and go. And that's where the "gee whiz" factor of the PFD starts to come in.

Automation is a key concept behind the EFD1000. An analog converter unit (ACU) allows multiple outside navigation sources and an autopilot to communicate with the box. That translates into full panel integration, and a reduction in workload for the pilot. An example is the autocourse feature. When selected by the pilot, the autocourse will sync up the navigation information with what's coming from the GPS. So when a waypoint is entered, the HSI automatically adjusts to reflect the given course.

This automation also extends to the approach phase. If flying a localizer or ILS approach, the system will change from displaying the GPS track to the localizer just before intercepting the course. That means load the approach

directional gyro. And if the pilot is new to glass, he or she doesn't have to rely on the airspeed and altitude tapes because the backup instruments still have to be installed, and can therefore be referenced. (Aspen's MFD has an independent ADAHRS, meaning once it's certified and both the EFD1000 and MFD are installed, most GA airplanes won't be required to have any backup instruments). If the user doesn't want the tapes, they can be turned off with one click of a soft key. It's a great feature that lowers the barrier of learning to fly glass because all you're left with is a digital rendering of the attitude indicator.

At first all the information in the navigation window looked cluttered. After all, the company is trying to fit an HSI with a basemap, flight plan information, a VSI, and a few other pieces of information into what used to be the space of only one instrument. It wasn't until the next day and the second or third approach when I began to turn off the levels of information that I began to really understand the nav display. You want only the HSI? Then set it. How about the HSI and just the flight plan legs and waypoints? That's the next setting. From there, the pilot can add all the base navigation information such as surrounding airports and VORs. And of course, there are the other bearing pointers if the pilot is a glutton for punishment. Traffic and



The flight director is in the form of pink rabbit ears. A blue altitude grommet can keep the pilot aware of a set altitude.

weather are expected to be future options on the Pro and, along with terrain and mapping, will be standard on the \$13,000 ATP version, expected out later this year.

The first night was all about exploring basic attitude flying with the box and setting up features like the minimums and altitude alerting. The second day involved two approaches, and this time it was on me to set up the SR22's dual Garmin 430s, the EFD1000, and the S-Tec Fifty-Five X autopilot. Setup is a relative term with the EFD1000 because there's practically nothing to do. It was a revelation to fly two approaches and never touch the CDI, never switch between navigation sources for GPS and localizer, and to be alerted when I reached minimums. And with no need

to scan, the approaches were stabilized and manageable.

I left the second day feeling confident with the unit and confident that Aspen Avionics is poised for success in the aftermarket glass world. The "Get Your Glass" sweepstakes Archer and Aspen's EFD1000 will be a big draw as we fly to Sun 'n Fun, AOPA Fly-In and Open House, EAA AirVenture, and finally to AOPA Expo in San Jose, California, in November.

The prospect of flying from Maryland to California in November in an Archer just got a little more enticing thanks to the EFD1000. Because if glass cockpits are all about improving safety, reducing workload, and making flying more enjoyable, Aspen Avionics will make our job a lot easier. **AOPA**

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AOPA PILOT ONLINE



View the Aspen EFD100 and other project updates on *AOPA Pilot Online*. (www.aopa.org/sweeps)

Your glass cockpit has arrived.



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Simple installation and operation.

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