



ON TEST ASPEN EFD1000

A GLASS COCKPIT ON A REALISTIC BUDGET

Aspen Avionics' EFD 1000 Pro is one of the lower costing glass cockpits. Dave Calderwood finds out more.

So you've got an older aircraft, you'd like a modern electronic flight information system but the idea of spending £20K or more is not on - what do you do?

One possible option is the 'mini' glass cockpit developed by US company Aspen Avionics, the EFD1000. At 3.5in wide, it's a similar width to ordinary analogue instruments and can be fitted into a regular panel without much fuss.

That's exactly what appealed to Peter Dobson, owner of a Piper PA-32. Installing something like Garmin's G500, which he also considered, was a step too far. The Aspen EFD costs just under £10K and took ten days of workshop time. It's also left his Piper close to the original spec and since it's very nearly a classic, that's important.

The system consists of four parts: 1. The display unit itself which includes a solid-state Attitude and Heading Reference System (AHRS) and digital Air Data

AT A GLANCE

- PRICE: \$9995
- Integral ADAHRS and back-up battery
- Integral altitude alerter
- Emergency GPS
- GPS flight plan 360 degree map views
- Slaved gyro with heading bug
- Dual GPS, dual VHF nav support

- Computer (ADC). The size of this unit is 3.5in (w) x 7in (h) x 4.0in (d)
- A configuration module
- A remote sensor module on the aircraft's outside, including: emergency GPS, antenna, flux gate sensor, outside temp sensor.
- The Analogue Converter Unit which interfaces with non-digital equipment such as the autopilot.

The EFD is mounted almost in line with the control column - just fractionally to the left but clearly in full view. The top half is an Attitude Indicator (Artificial Horizon) with vertical Air Speed and Altimeter tapes either side.

EFD1000 SCREENS



PRO 360
"The screen resolution is very precise and bright indeed, with no doubt over the figures being displayed on screen."



PRO ARC
"Instead of showing of the entire 360 degree view you can zoom in so the angle of attack is easier to see and read."



As we turned in the bright sunlight, the unit retained its clarity and even from the right hand seat I could read every bit of information.

A Vertical Speed Indicator (VSI) is only visible when there is a change of altitude which Peter likes: "You are immediately aware of any change in height as the VSI becomes visible and your eye is drawn to the display."

The lower half of the one-piece screen has a Horizontal Situation Indicator (HSI) which can be changed to an arc if you prefer. This is completely integrated with the Garmin 530 navcomm and also the Century autopilot so a flightplan inputted into the 530 will come up on the HSI. It also integrates with a Traffic Collision Awareness System.

Various other bits of information are located in logical places around the screen including pressure setting, GPS-derived wind vectors, True Air Speed, Ground Speed, slaved compass and a slip indicator.

This was one of the first UK installations of the Aspen EFD and naturally enough, our CAA had its

own views on how it should work. "In my view these are severe," said Peter. "Unlike the FAA the vacuum AH has to be fitted on the same eye-line as the EFD1000's AH. I'd have preferred the FAA approach, fitting the Vacuum AH in place of the Turn & Slip and move the Turn & Slip left to replace the ADF indicator (now incorporated as an RMI in the EFD)."

"The CAA also inhibit the AH de-clutter facility, so the Air Speed and Altimeter tapes cannot be turned off, even though the mechanical instruments are right next to the EFD1000."

"The Air Speed tape can display lots of reference speeds which is useful but the CAA says these have to be all on or all off, and not selectable as is allowable by the EFD1000. The reference speeds clutter the tape and in certain phases of flight are not helpful." Time to fly. Well, not quite. The Aspen EFD takes a little while to set itself after switch on, so

Peter has rewritten the checklist to perform other tasks while the Aspen warms up. It can't be switched on until after engine start and has its own master on/off switch to protect it from power surges. The Garmin 530 self-test page is transferred to the EFD1000 so the operation of both bits of kit can be checked at the same time.

Checks complete, pressure set using the right hand knob, we taxied away from Duxford's apron doing the usual weave to make sure the compass and HSI were moving correctly. We were airborne and turning into the circuit before you could say 'I want an Aspen EFD1000'.

As we turned in the bright sunlight, the unit retained its clarity and even from the right hand seat I could read every bit of information. Peter says he finds the EFD's Artificial Horizon much more accurate than the vacuum AH, and climbing out on the AH in

IMC conditions is easy holding the Vx reference speed.

"It is easy holding course, height and speed on the EFD1000 in flight," he says. "If you want a break the EFD1000 will pass on route data from the Garmin 530 to the autopilot allowing a complete route to be flown hands-off."

We flew north-east from Duxford staying clear of nearby Cambridge Airport, but close enough to pick up a couple of aircraft in their circuit on the TCAS - displayed on both the 530's screen and the Aspen. To return, Peter put Duxford into the GPS, activated the autopilot and, hands-off, the aircraft turned onto the return flight. The very clear HSI showed how we closed on course.

However, integration with the Century III autopilot is not perfect. "I didn't discover this until installation was complete, but autopilot does not integrate well with the EFD1000. The result is that the vacuum AH is still needed

for AP input. Loss of instrument vacuum means loss of autopilot. Also, the Century III does not support the EFD's Flight Director which was a disappointment.

"Flying ILSs without the Flight Director requires more practice on my part. I've only flown a couple of practice ILSs with the kit so far."

Peter feels the EFD1000 would benefit from a PC computer simulator as is available for the Garmin 530. Flight1, however, offer an EFD1000 for Microsoft FSX programs. An Aspen EFD training DVD is also available from US pilot shop, Sportys.

Among the other benefits of the Aspen EFD is redundancy should there be electrical or vacuum system loss - it will run for 30 minutes using its own battery.

"I'll leave the last word to Peter: "Overall, the EFD1000 is a nice piece of kit, a delight to use and professionally installed under the CAA's ever watchful eye by Lees Avionics."

EFD1000 RIVALS

BENDIX/KING
BENDIX/KING'S entry level EFIS systems come in the form of the Apex Series. The KFD840 is the PFD and is a self contained unit with embedded AHRS and is independent of both the aircraft vacuum pump and also



outside GPS. The KSN770 MFD unit also combines with the 840 and includes a moving map.

GARMIN
At the Last Oshkosh Garmin announced its latest glass cockpit, the G500. At half the price of the G600 it really is competing at the 'budget' end of the market. The 500 includes the GDU620 display/control unit, AHRS, GDC74A digital air data computer,



tri-axial magnetometer and the GT59 temperature probe. Plus it can have SVT installed.

DYNON
IF you have a homebuild then Dynon might be the glass cockpit of choice. Also launched at Oshkosh last year, the Skyview system caused a great stir. With 3D terrain and a full system for under \$10,000 it's well worth considering. The full system includes



twin 10in EFIS displays, redundant ADAHRS, engine monitor and back-up battery.