+ON TEST GARMIN G600

BRILLIANT GLASS RETROFIT FOR OLDER AIRCRAFT

Garmin's new G600 twin screen display in a PA28

EVER had that sinking feeling that something you've been working hard on is just about to be superceded? When halfway through producing the Supplementary Type Certificate (STC) for the Garmin G600, Lees Avionics, one of Europe's top avionics engineering companies, discovered that Garmin was about to launch the G500 – an almost identical unit at a much lower price.

The only important difference between the two units is that the G500 is cleared for Class 1 & 2 aircraft – up to 6000lb weight – while the G600 is also cleared for heavier and bigger Class 3 aircraft. For the light and general aviation market, the G500 is the obvious choice and Harry Lees, boss of the company, doesn't expect to sell many more G600s once EASA has given final approval to the G500. As soon as that happens, Lees will amend the G600 STC to include the G500.

If you are looking to upgrade an older aircraft with a retrofitted glass cockpit, then the G600/500 demands attention. It is a single unit with two side by side screens, each 6.5in across diagonally, and it replaces the traditional six-pack of analogue flight instruments. The left hand screen is the Primary Flight Display (PFD) and the right hand screen is a Multi Function Display (MFD) that would normally show a moving map during flight.

Well, the G600 doesn't quite replace the old gauges because EASA requires that the key flight instruments – Attitude Indicator (AI), Air Speed Indicator (ASI) and Altimeter – be kept on the panel as back-ups. To achieve this neatly, Lees Avionics decided to create a brand new flat panel. The G600 unit sits right in front of the pilot with the AI lined up with the control column, and other instruments located either side.

Take a look at the photos of the unit as fitted to Lees' demo plane, a Piper PA28 Archer. It's a really neat and logical arrangment with the exception of the ASI which a bit tucked away on the far left. Harry Lees plans to move that in closer on future installations.

We went for a flight in the Archer with Harry from the company's base at Wycombe Air Park. Not only does this PA28 have the G600 but it's also fitted with an S-Tec autopilot and an Avidyne TAS610 traffic collision awareness system... which would later prove useful on this lovely sunny day.

The G600's PFD comes on as soon as the master switch is on, and there's about a minute wait while the Attitude and Heading Reference System (AHRS), a separate box mounted in the back of the aircraft, aligns itself. The MFD is also on straightaway and displays a checklist of databases with their currency and expiry dates – charts, obstacles, terrain etc. You have to acknowledge this before it moves on.

The G600 takes its GPS and nav feed from separate boxes such as Garmin's 430 or 530. The Lees' aircraft has both so when the avionics master is switched on and these come to life, the G600 MFD mirrors the message on the navcomms units about 'acquiring satellites'. A minute later and the moving map is on the MFD with the aircraft position displayed. Our simple plan was to fly out to the Westcott VOR to the north of Wycombe, but you can import a complete flightplan.

As we left Wycombe and headed out towards the Stokenchurch Mast – not on the chart used on the moving map, by the way, and we did not have the Obstacle database loaded – the two screens were completely unaffected by the bright sunlight. Of course, the PA28 has a solid roof providing shade but even when we banked and sunlight filled the cabin, the displays were still crystal clear. Very impressive.

Also impressive was how easy it was to find your way around the G600. On the PFD, there's a vertical row of buttons on the left which each have an on-screen function – HDG (Heading), CRS (Course), ALT (Altimeter), V/S (Vertical Speed) and BARO (pressure setting). Just press the function you want to change, such as HDG, then turn the knob in the bottom left corner and the Heading bug moves round.

On the MFD, the main knob in the lower right corner switches between screens such as VFR chart, IFR chart, terrain and traffic. If you had a weather input, it could show that, or you can import airport plates.

Just after passing Stokenchurch, Harry engaged the autopilot and the G600 gave 'roll-steer' directions. As it picked up WCO, the aircraft started to turn, hands-off, and pick up the track indicated by a bright purple line on the moving map.

As we flew closer to Westcott, the TCAS proved its value – quite a few other aircraft were also using the VOR as the centre of a training area. The Avidyne TAS610 picks up the transponders of other aircraft and places them on the chart. When a helicopter thrashed through a bit closer, the warning was unmissable – the screen went black, the aircraft position was highlighted and a voice warning.

Heading back to Wycombe, Harry demonstrated some of the nice touches of the G600. The large yellow arrow in the centre of the PFD makes hand-flying very straightforward. I'm not quite sure how Harry did it but he created a 'localiser' (extended runway centreline) for Wycombe's runway 06, shown on the MFD chart as a bright purple line, which made our instruction from ATC to join left base very easy to work out.

Coming in to the circuit, watching the air speed and height was straightforward on the PFD's vertical tapes, with a 'trend' indicator on both giving a six-second ahead prediction. Mind you, I also found my eyes flicking down to the analogue ASI and Altimeter occasionally – old habits!

There's a lot of work to install the G600/500 glass cockpit and the display itself is the tip of the iceberg. As well as installing a whole new panel, you'll need either a 430 or 530 if you don't have one already. Lees also has to strip out much of the cabin to install two boxes in the back, the Attitude and Heading Reference System and Air Data Computer, and a Magnetometer (digital compass) which has to have lightning shielding. All this is covered by the STC that Lees has developed and is aircraft specific.

All of this comes at quite a price – around £25,000 for the G500 (when it's available), a GNS430 and all the installation work. However, if your aircraft is due for a bit of a refit, or perhaps you just want to go glass, then the Garmin G600/500 is definitely worth considering.

+AT A GLANCE

PRICE: £4595.00

- Dual 6.5-in diagonal LCD displays
- 4.8-inch attitude indicator
- SVT synthetic vision option
- Solid-state Attitude and Heading System and Air Data Computer
- Terrain and obstacles databases
- Input for weather radar
- GPS mapping, optional traffic, terrain and datalink systems

OWNER

Sandra Haine, CFI at British Airways Flying Club, Wycombe, uses a G600 in the club's Piper Dakota...

I'm really pleased with how it works!

For me, the G600 is a truly excellent tool for getting qualified pilots used to a glass cockpit in a familiar machine.

Glass cockpits can actually be really daunting but we've found that the 600 is great for people wanting to learn.

It's good because it's fairly intuitive to use, especially if you are familiar with Garmin's 430 – you'll find the G600 easy as it has the same flightplan set up across both of the units.

I think the Dakota helps with G600 as it's a long range aircraft – you really get the full use of the 600 as it's better to use when travelling long distances.

We don't have the SVT synthetic vision on it at the moment, but I'd like to have it as a feature. We'll just have to wait and see if we can get it!

+RIVALS

+ASPEN

LEES Avionics is also an agent for the Aspen Avionics EFD1000 PFD which can be paired with the EFD1000 MFD for a twin screen display. The PFD installation on its own works out at around £10,000. Good as the Aspen unit is, when you compare it side by side

with the G600, it's not in the same league. However, if panel space and/or budget dictate, it's a good choice.

+SAGEM

US-based with a French owner, Sagem Avionics has concentrated its glass cockpit retrofits on the helicopter market where it has several STCs. It has two sizes with 8.4in and 10.4in screens which can be used as a PFD or MFD, or configured with a split screen to show both.

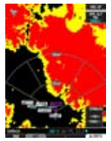
HeliAir at Wycombe has just completed the first European installation of the 8.4in ICDS-8 glass cockpit into an R44.

+BENDIX KING

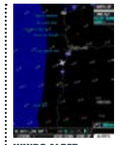
THE Apex Edge Series is Bendix King's entry. The KFD 840 Primary Flight Display has an 8.4in screen and is a self-contained unit with an embedded AHRS, and is independent of both the aircraft vacuum pump and also outside GPS. Partnering the PFD is Bendix King's 'Next Gen-

eration' GPS/Nav/Comm MFD unit, the KSN 770. It combines an IFR GPS navigator, integrated TAWS and moving map.

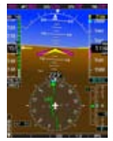
+G600 SCREENS



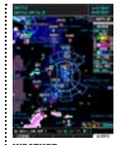
TERRAIN
Built-in elevation database gives advance warning of terrain conflict



WINDS ALOFT
Showing wind direction and strength, here at 6000ft



PRIMARY DISPLAY
It's all there: horizon, air speed (left), altitude (right), HSI (bottom)



WEATHER
See where the weather is, and avoid it! Needs additional input