Keeping it real

Instrument-rated 172 pilot ***Steve Copeland*** *flight-tests three home computer flight simulators for VFR and IFR practice*

We often hear pilots ask whether a personal computer-based flight simulator is any benefit in learning new skills and maintaining currency. So we decided to take a close look at the three main simulators, Microsoft Flight Sim X for the PC, X-Plane for the Apple Mac, and Elite IFR Flight Simulation for the PC.

First out of the box was Microsoft Flight Simulator X - Deluxe Edition, the latest version of the longstanding Windows simulator. Provided with this package was the FSX accelerator pack, designed to enhance the gaming experience with improved environment performance. The game boasts 24,000 airports worldwide and over 30 missions for the hardcore enthusiast as well as a variety of photorealistic scenery add-ons. Control can be through a variety of devices – joystick, keyboard, yoke, and even the Xbox 360 controller.

I chose to connect the CH products flite sim yoke for my tests. These are a USB device and work equally well on Apple or PC platforms. Installation was simple, with the game now being provided on a pair of DVDs rather than the several CDs of previous versions.

Flight Simulator X was installed on a Sony HD media centre PC with Core 2 processors, 3GB RAM and 512MB ATI Graphics card. Plenty of horsepower under the hood for the test.

On launching the game a variety of options are available, including a training option for first-time users. Being an old hand I elected to dive straight in and choose an aircraft for my planned sorties. I selected the trusty Cessna 172, a type that I have more than a thousand hours on in real life, to give me a better comparison of the real world versus the simulated one.

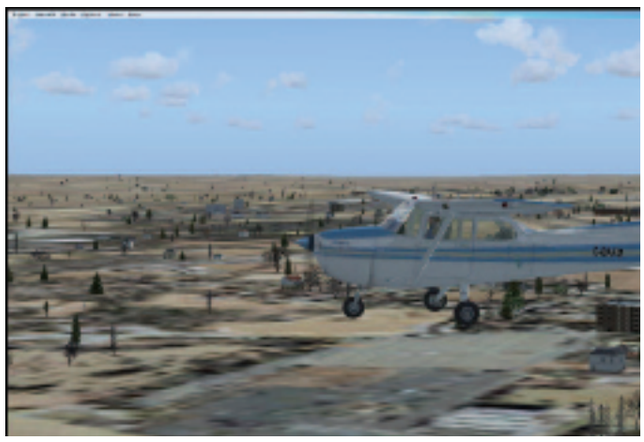
The objective of the test was to make two flights, the first a VFR flight to see if the simulators were a practical tool for practicing VFR navigation and handling. The second flight would be an airways flight with standard instrument departure and IFR arrival and procedural approach.

The first thing you notice about FS-X is the quality of the graphics. They are sharp and vivid and give the whole simulation a quality feel. The instruments react in a realistic manner, although the ADF does not give real 'dip' during turns. The software interacts well with the yoke and pedals but lacks the realism of feel and hand flying; the motion is a little to 'digital'.

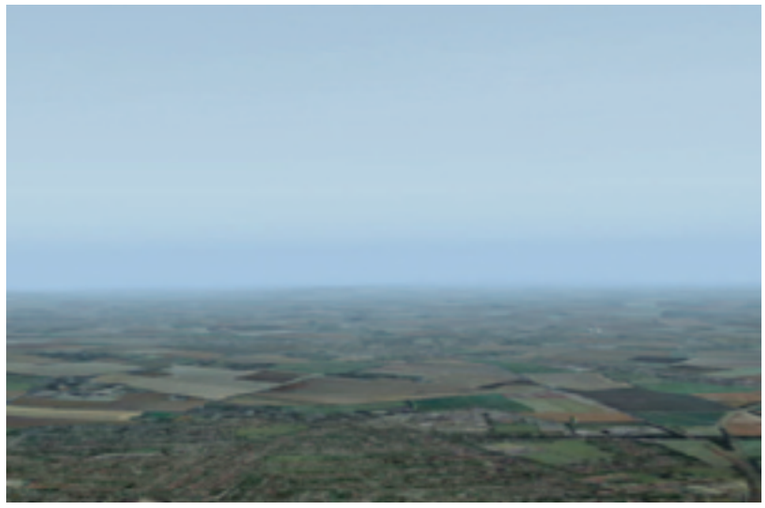
FS-X has a function to enable real time weather drawn from real aviation weather sources, which provides greater realism and a more dynamic feel to the simulation.

The second of the three simulators on test was X-Plane from Laminar software and is the simulator offering for the Apple Mac, although it is also available for the Windows platform. Written by a tiny company of Mac enthusiasts, calling this a game is doing it a great disservice. X-Plane is probably the world's most comprehensive, powerful personal computer based flight simulator, and has the most realistic flight model available for personal computers. There is even an FAA approved variant that allows FAA instrument pilots to log simulator time. As with the Microsoft offering there is a variety of photo realistic data that covers vast areas of the earth. A full installation takes almost 60GB of disk space. So accurate is the X-Plane flight model that it is used by aeronautical engineers to model prototype aircraft.

As with the Microsoft offering, X-Plane has a wide variety of aircraft to choose from – in fact, more than 40 types as standard ranging from the Cessna 172 to the SR71 and even the Space Shuttle. Installation, as with all things in the Apple world, is a doddle. Insert the DVD and drag and drop the icon into applications, and 20 minutes later the application is ready to run. The testbed for this was an Apple iMac Extreme 3ghz Core 2 Duo with 3Gb RAM.



Left: graphics in Flight Simulator X are sharp and vivid
Below: FS-X gives you the luxury of a wing-mounted camera, and a 'formation' representation



Above: X-Plane is 'probably the world's most comprehensive personal computer flight sim' Above right: photo-realistic data covers vast areas of the earth

Once again I chose the trusty 172 for my test and also installed the photo realistic scenery.

The final offering in our trio of simulators was the Elite IFR simulator. This is sold as a tool for aiding instrument pilots in training and maintaining currency and can be mated to a number of hardware options including a full realistic instrument stack. Elite is the simulator system you often see in the broom cupboard simulators at many flying clubs. Delivered on a confusing array of CDs and memory 'sticks' it was the least intuitive of the trio to install, and it took me over an hour to get it working. The installation instructions were less than helpful! The Elite simulator also requires an 'ignition key' to be installed in a USB port in order for the application to run. The graphics were the lowest quality of the three and would clearly benefit from an update. The fact that the application supports Windows 98 and NT is probably an indication that the code is starting to get long in the tooth. However the panel is clear and realistic enough to provide a good training interface and as it is sold as an instrument trainer rather than a simulation game is more than adequate for the job.

On each of the VFR simulators I planned and carried out a VFR flight from Leicester to White Waltham via the Wescot beacon on my CAA half mil chart, downloading the weather from the internet. Lining up on the runway I took off and climbed to 2000ft in the overhead at Leicester and made my turn towards the WCO NDB, tuned and idented the beacon and set off in the direction of Wescot, matching ground features to my map just as I would do in the real world. The quality of the graphics were quite clear from the photo realistic scenery, which is available as a third party option. Identifying ground features was quite easy and cross checking with the ADF ensured I was on track. I arrived at Wescot as planned and made the turn towards White Waltham. On arriving in the White Waltham overhead, using my Pooleys Flight Guide I was able to join the circuit as required for noise abatement. However the lack of 3D view made positioning visually into the circuit very difficult and I struggled for a while to orientate my self. Once I had worked out where I was the approach and landing were normal.

My next test flight was to be one I fly routinely in real life, which is airways to Guernsey from Leicester. The route is a simple one, joining airways at WCO then R41 to SAM R41 to ORTAC and then onto the GSY for the instrument approach. I set up the weather to a 300ft overcast and light rain with cloud tops at 9,000ft. Lining up as before, I took off and started direct towards WCO climbing to FL100 and breaking into the simulated sunlight as I passed through FL90. The indications on the instruments and the GPS were exactly as I was used to seeing in my own aircraft and the cruise was easy. On arrival at Guernsey I flew the procedural approach for R27 and broke out at 300ft as expected, having flown a very realistic ILS on all three simulators.

I repeated the flights across each of the simulators and achieved pretty consistent results across all three. When it came to hand flying, the X-Plane model was the most realistic of the flight envelopes, responded smoothly to the control inputs and was realistic in pitch and trim, the others feeling very 'digital'. The Elite simulator is designed for IFR flight so I only flew FS-X and X-Plane on the VFR flights and both of them performed well. With the photo realistic scenery enabled, it was easy to relate ground features to the map. Without having it enabled, the detail was not good enough for effective VFR navigation.

Where all three of them came into their own was for the IFR flights. The instrumentation was clear and easy to read and provided positive feedback for situational awareness. Using real airways charts and current instrument plates I was able to fly the entire trip from Leicester to Guernsey on the instruments successfully, breaking out at 300ft on the ILS.

So to answer the original question - do we think that that computer-based simulators are an aid to training and currency? The answer is yes, with a few reservations. For handling currency none of the simulators tested provided the level of tactile feedback that left me feeling like I was flying a real aircraft, although X-Plane provided the greatest level of realism in this respect. VFR navigation practice was marginal at best and only really made possible by adding third party photo realistic scenery.

For IFR practice all three provided a high level of realism and I was able to accurately maintain situational awareness from take off to landing using the instrument presentations. For instrument pilots visiting new airfields, it is a perfect way to practice the approach and en-route segments. ■

Left: Elite panel is 'clear and realistic enough to provide a good training interface'