

**From:** Nat Sims [sims.nat@gmail.com]

**Sent:** Tuesday, January 06, 2009 1:29 PM

**To:** Ed Marks; Dennis Schneider; Hampton, Rickey L.; L. Dennis Shapiro

**Cc:** Sims, Nathaniel M., M.D.; Thomas Perry; William Midon; Ed Trautman; UhligPN@healthall.com; Jeff Simon; damien dalla rosa; Adrian Hlynka; Chris DiBona; Eric Von Hippel; Jeffrey Smith (Faculty); Thomas Goulding; Russell Lewis; Rich Bertoli; NJSFlight@gmail.com

**Subject:** Progress with PC-based Flight Simulation for Aviation IFR training ---- pictures from "Flight in Google Earth" mashup

**Attachments:** Flight in Google Earth 01\_06\_09\_compressed.doc

Dear Friends,

Happy New Year: Over the Holidays I was able to do, with valued assistance from Thomas Perry and others, some further work on a project that has been a part time interest [obsession?] for a year or two, to answer the following question:

\*\*\* is it possible to design a \*highly-affordable/easy-to-use\* system that permits a pilot to train themselves, or augment conventional training methods, to fly any aircraft, but particularly technologically-advanced-aircraft (TAA) in the IFR environment on a PC using Microsoft Flight Simulator, and to export data, in real time, to other applications (including Google Earth) that would enhance situational awareness, and also make it more fun and interesting to learn/perfect the arcane art of safe IFR flying?

The attached screen-captures illustrate part of the system - the screen captures are only what you see on the two monitors connected to the master PC - what is not shown is the attached Garmin 396, and the secondary networked PC running a synthetic vision application which has a 'flight path predictor'. Waypoints in Google Earth are supplied by [www.enflight.com](http://www.enflight.com), Electronic Charts from SimCharts / Jeppesen, Goops is the Google Earth Viewer managing centering and rotation-angle of the screen object representing the aircraft, and Space Navigator from 3DConnection is a wonderful human interface for zooming around in Google Earth. Thanks to Ed Trautman for many early insights and for finding the Space Navigator. Thanks to Adrian Hlynka and Jun Yu from Mercury for the way to link FS with the synthetic vision application, and to Tom for getting it to work again after a hiatus in the effort.

A particular benefit of having all of these displays is the ability to set the 'Flight Simulator weather' to absolute IFR minimums and, with the aid of the other displays, have a really high probability of a realistic and satisfactory approach and 'minimums' landing. Then the trainee may be better prepared for the 'real world'. The "curriculum" is a collection of about 100 "12-minute-challenges" where a pilot may elect to e.g. fly the GPS 16 approach into Leadville, Colorado (highest US airport) from a nearby airport. Another 12-minute challenge would be to fly from Springfield, VT, to Rutland VT in terrible weather. The user picks a sequence of departure, enroute, and terminal waypoints that are linked in a single flightplan that is provided to [www.enflight.com](http://www.enflight.com) (which returns a .kml file for Google Earth) and provides flight management on a departure-runway-to-arrival-runway basis. The autopilot executes the flight

path. As you can see from the second flight, not all landings have perfect outcomes - the KingAir 350's nose-gear needs a bit of repair.

Several of you have seen bits and pieces of this as it has evolved . . . but the earlier versions were quite troublesome to set up, or to keep all the 'connections' happy in a reproducible and reliable way.

These issues are now better such that the system description can now be written down and possibly set up by a skilled individual or with minor assistance/training.

There is *nothing particularly inventive or novel*

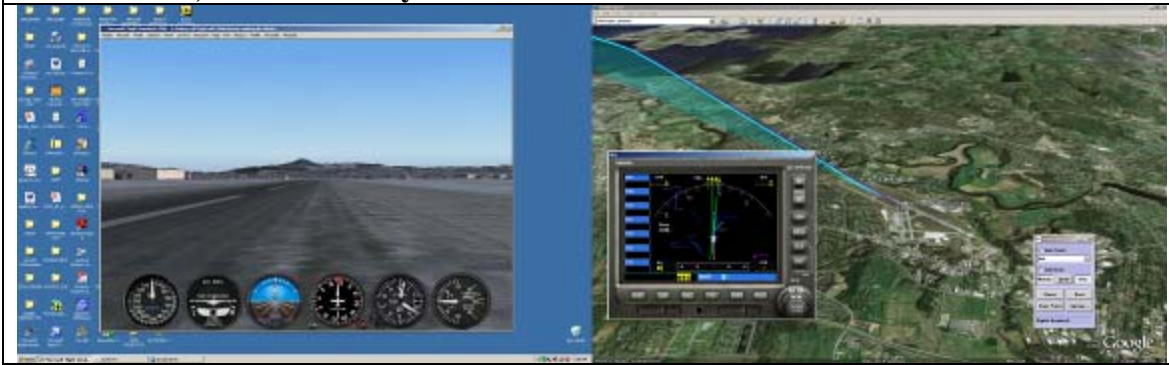
in what has been done.

The bits and pieces all have existed previously, and are just 'mashed-up' in a way that might be useful to actual pilots wanting to attain or maintain competency in technologically-advanced-aircraft.

Feedback is sought, but no need to respond!!

Nat Sims  
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**December 27, 2008 – Mooney Bravo PBG to BTV ILS 15**



**January 5, 2009 – King Air 350 Eagle County (KEGE) to Leadville (KLXV)**



**January 6, 2009 – Baron G-1000 Princeton (KPNN) to Eastport, ME (KEPM)**

