

Four Steps to Improve Home Flight Simulator Realism (Or, How I Learned to Stop Worrying and Not Completely Hate Being Grounded During COVID-19)

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ALWAYS CONSULT WITH A CFI (I.E., **NOT** ME) PRIOR TO CONDUCTING ANY AVIATION TRAINING THAT IS INTENDED TO BE APPLIED TO THE REAL WORLD. SERIOUSLY. FLYING IN THE REAL WORLD IS DANGEROUS AND THE WORST THING THAT CAN HAPPEN TO YOU ON A COMPUTER GAME IS GETTING MADE FUN OF BY SOME 12-YEAR-OLD KID.

At-home, recreational flight simulator programs are fun (!) and can simulate many different aspects of real-world flying.

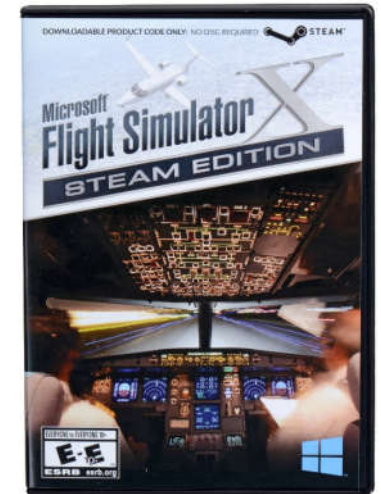
But there are some problems!

- Intended as games, and not purpose-built training tools
- Some features designed to appeal to a broad audience, and not necessarily real-world pilots
- Functionality limited to maintain a certain price point
- Lack of updates to reflect key changes in equipment, procedures, navigation data, etc.

The good news is that there is a robust and vibrant developer community to help you customize your setup without spending an outrageous amount of money.

For the basic simulator software, you have some choices. Choices are good! Choose wisely!

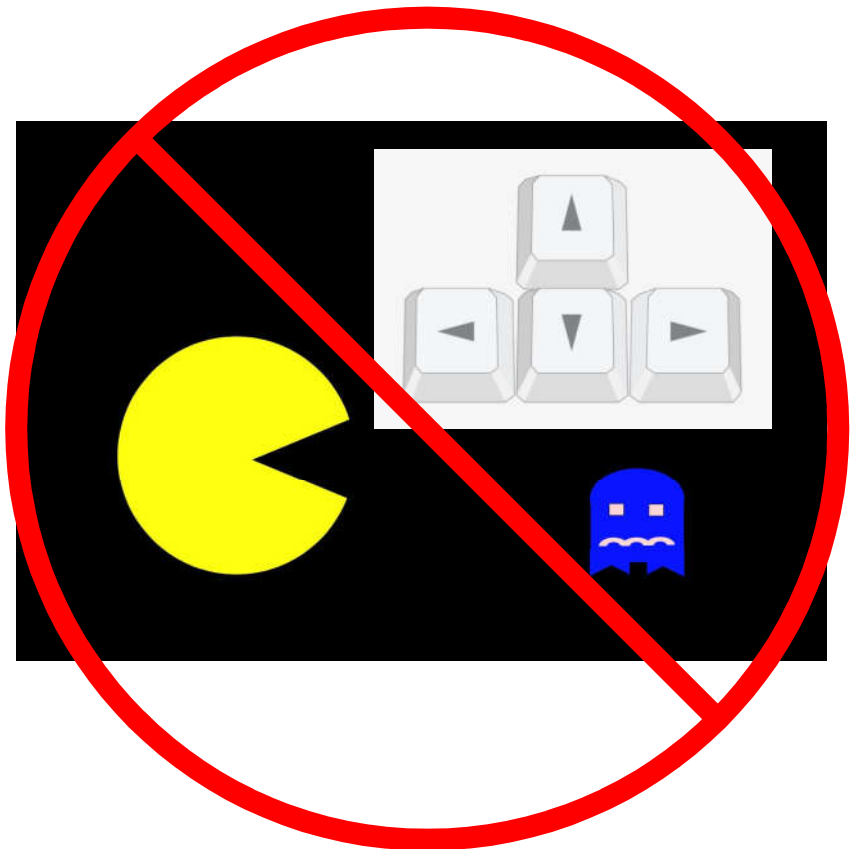
- Microsoft Flight Simulator X (“FSX”) – released in 2006
 - \$24.99 on Steam:
https://store.steampowered.com/app/314160/Microsoft_Flight_Simulator_X_Steam_Edition/)
 - New version (called *Microsoft Flight Simulator*, price TBD) will begin beta testing in July 2020; looks great, but graphics demands are insane
 - Bonus: This is the version I use!
- X-Plane 11 – released in 2017
 - \$59.99: <https://www.x-plane.com/desktop/buy-it/>)
- Prepar3D v 5.0 - released in 2020
 - \$199 for professional license:
<https://www.prepar3d.com/prepar3d-store/>); discounts available for student license



These programs are graphics intensive. Make sure your computer can meet the system requirements before you start blowing cash! Otherwise you will have a bad time before you get off the (fake) ground.

I recommend following a guide for installing flight simulator to maximize performance. See, e.g., here for FSX: <https://www.avsim.com/files/file/41-avsim-basic-fsx-configuration-guide>.

Step 1: Flight Control



My goal: approximate the motions required for control and power inputs and preserve muscle memory

My setup: Logitech (formerly Saitek) Pro Flight Yoke and Rudder Pedals

- \$329.95 on MyPilotStore:
<https://www.mypilotstore.com/mypilotstore/sep/13358>
- Can purchase the yoke/throttle quadrant separately from the pedals for \$169.95 each
- Lots of other products out there for yokes and sticks; I have heard really good things about the Honeycomb Alpha Flight Yoke (\$249.00) and will probably buy when I get brave enough to talk to my wife about it
- Whatever you get, look for reviews about control feel and try to get as many switches as possible (these can be mapped to commands in your simulator!)
- This is **not** an FAA-approved aviation training device!



Step 2: Weather



“A Tale of Two Approaches.” KFME RNAV RWY 10, 0.3 DME from POGKI. Ceiling set to MDA, and airplane is at 900’ MSL (100’ above MDA). Left is stock FSX weather, right is ActiveSky Next weather.

My goal: Accurate weather engine that allows detailed user input and accurately simulates cloud height, visibility, etc. to allow for realistic IMC flying

My setup: Active Sky by HiFi Simulation Technologies

- I use an older version, Active Sky Next (circa 2015); significant realism improvement over the FSX weather engine (see previous slide)
- Newer versions of Active Sky (see: <https://hifisimtech.com/>) available for \$34.99 to \$49.99, depending on corresponding simulator program
- Versions available for FSX, X-Plane 11, and Prepar3d v4.0 (previous version); beta testing in progress for Prepar3d v5.0
- Other payware and freeware weather engines are out there; see what works for you!

Step 3: Realistic GPS/RNAV



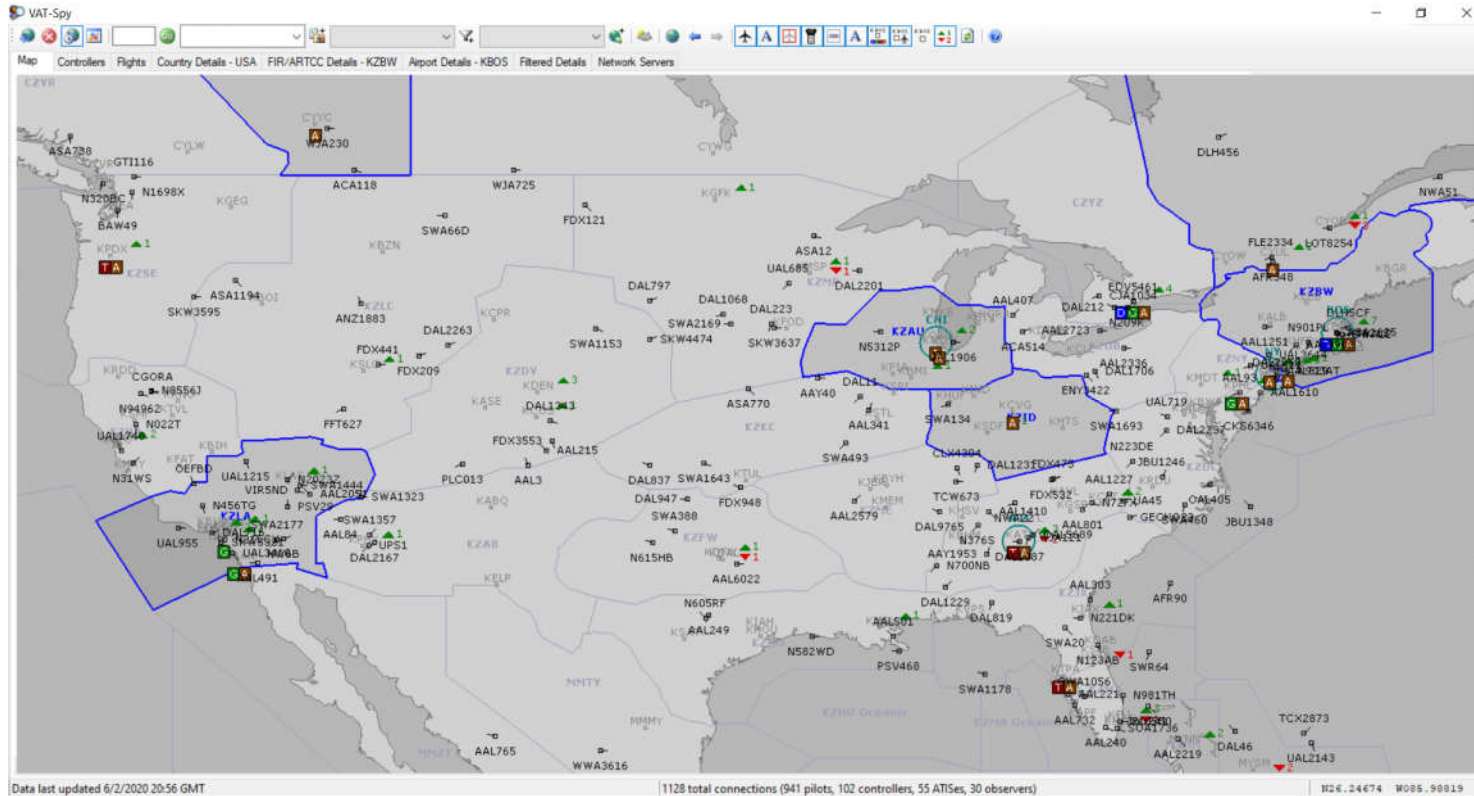
“If loving the magenta line is wrong, then I don’t want to be right.”

My goal: Replace the FSX stock GPS (limited to “direct to” operations and stuck on old navigational data) with a fully simulated G430 unit with up-to-date navigation database and procedures

My setup: Mindstar Aviation GNS 430/530 with RealNav Data

- \$49.95 for the GNS 430/530 simulator (available at: http://www.mindstaraviation.com/Product_430_530.html)
- \$39.95 for a one-year subscription to RealNav Data (available at: <https://www.realnavdata.com/buy.asp>)
- Only works with FSX and older versions of Prepar3d (v3.0 and earlier). No compatibility with X-Plane 11.
- There are other G430 simulators out there (e.g., Flight 1 GNS Complete: <http://www.flight1.com/products.asp?product=gnscomplete>), but nothing I’ve seen is updated regularly with real navigation data that can be installed by those of us without ninja-level computer skills

Step 4: Real ATC



The AvGeek's idea of a fun Tuesday evening. Zero percent of these flights resulted in new COVID-19 cases.

My goal: Replace the FSX AI air traffic control system (which is pretty terrible) with real people providing ATC services with a high degree of competence so I actually forget I'm stuck at home during COVID-19 and instinctively reach for the phone to call FAA if I bust through an altitude assignment...

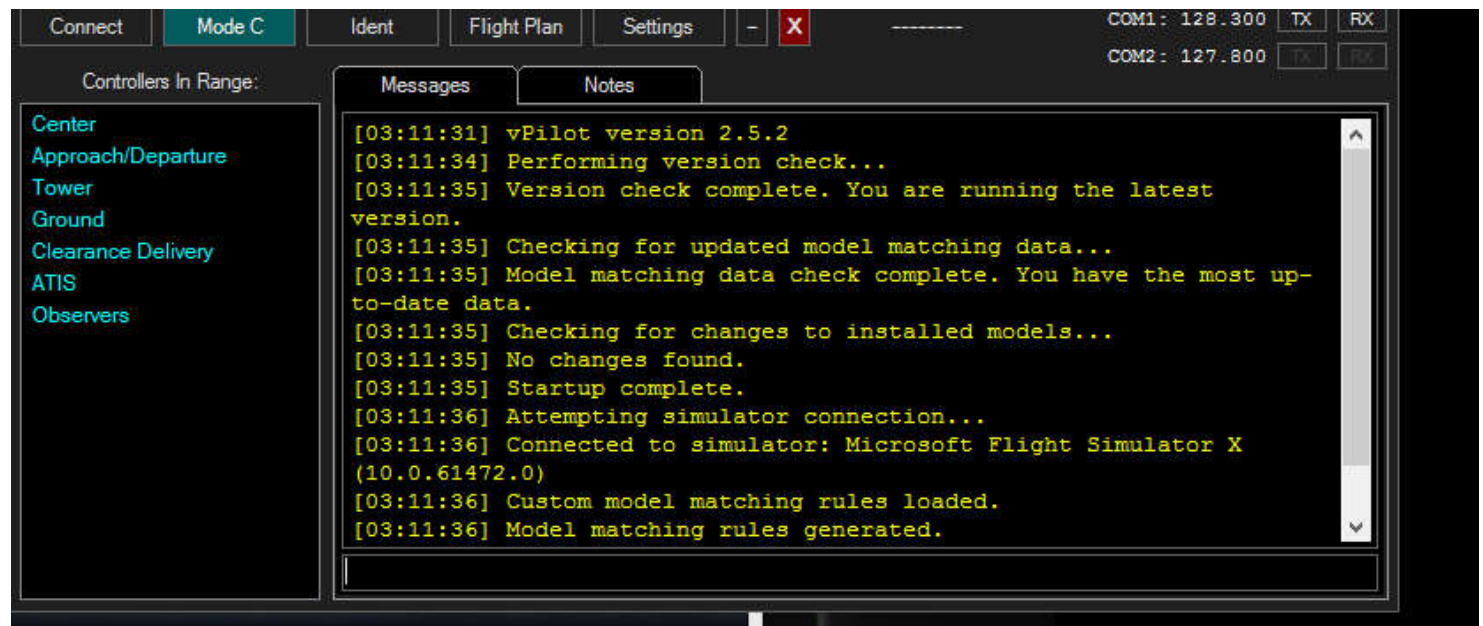
My setup: VATSIM (<https://www.vatsim.net/>)

- Price: j/k...it's totally FREE!!!
- Worldwide network of controllers and pilots flying in a massive (global) multiplayer online environment using real-world procedures, phraseology, and rules
- High level of quality ensured through governance procedures and training
- ATC service at any given time based on controllers who log on to “play” and cover an airport control function, TRACON, or ARTCC facility of their choosing
- Due to lack of complete coverage, best to plan flights between airports that people are controlling at a given time, but you can still fly part of the route uncontrolled airspace (VATSIM UNICOM = 122.8)
- Another option is IVAO (International Virtual Aviation Organization)
<https://www.ivaoo.aero/>

Two steps to join VATSIM:

1. Apply to join VATSIM (<https://www.vatsim.net/join>) and get a pilot ID.
2. Download a pilot client (i.e., software to connect your flight simulator program to the VATSIM Network)
 - I use vPilot (<https://vpilot.metacraft.com/>); easy setup and interface
 - It also helps to download VATspy (<http://www1.metacraft.com/VATSpy/>), which lets you see all the controllers who are online at a given time and plan your flight
 - I recommend disabling the FSX AI ATC

vPilot – all you
need to fly
the virtual
skies!



Flying on VATSIM:

1. Open up vPilot and file a flight plan
2. Load your aircraft at your desired airport (not on an active runway!)
3. Connect to VATSIM network, tune radios in your flight simulator the appropriate frequency, contact controllers as you would for clearance in real life
 - If controllers are missing, talk to the next logical controller (e.g., if an airport is missing clearance delivery, ground, and tower, but has an approach controller, contact the approach controller for clearance)
4. Squawk Mode C when airborne
5. Follow controllers' instructions!

File Flight Plan - Current Time: 0313z

Flight Type: IFR

Heavy Aircraft:

Equipment Suffix: G

Departure Airport: KMVY

Destination Airport: KPVD

Alternate Airport: KPYM

Departure Time: 0230 hhmm Z

Time Enroute: 0 hh 45 mm

Fuel Available: 4 hh 0 mm

Cruise Speed: 105 TAS

Cruise Altitude: 4000

Route:

Remarks:

Voice: Send + Receive Receive Only Text Only

File Flight Plan Fetch From Server Load... Save... Clear Close

Cost Breakdown

FSX Steam Edition	\$24.99
Logitech Yoke and Rudder Pedals	\$329.95
ActiveSky	\$34.99
Mindstar Aviation GNS 430/530	\$49.95
RealNav Data	\$39.95
VATSIM	\$0 (!)
Total:	\$479.83



Equal to approximately 3.7 hours of FMFA C172 rental...

If you're after even more realism consider the following:

- Updating the stock FSX C172, which is pretty lousy (A2A Simulations' Accu-sim C172 Trainer (\$49.95) is supposed to be one of the best versions: <https://a2asimulations.com/product/accu-sim-c172-trainer-fsx/>) or downloading other realistic GA aircraft.
- Adding additional avionics hardware, like a radio stack, G430 hardware simulator, etc. (see, e.g., <https://realsimgear.com/collections/avionics-components> and <https://www.sportys.com/pilotshop/learn-to-fly/flight-simulator/hardware.html>)
- Buying/downloading scenery enhancements for the area you are flying (see, e.g., <https://www.megasceneryearth.com/>, <https://www.justflight.com/category/flight-sim-add-ons/scenery-and-airports>, and <https://www.aerosoft.com/en/flight-simulation/flight-simulator-x-steam/sceneries/>).
- Upgrading to aircraft you're not yet allowed to fly in real life, like any of PMDG's airliner models, which are AMAZING and accurately simulate airliner syst (<https://pmdg.com/fsx/>)

Thank you! Have fun flight
simming!

Questions?