The simpit uses one PC running Linux, to drive the captain’s instruments and the main display, from a single nVidia GPU. All simulation is done by FlightGear: flight model, weather, atmosphere and rendering.

The main display is a 4K TV: it’s limited to 30Hz refresh rate until I replace the GPU with a better one. (FlightGear itself can render at much faster rates)

The EICAS (center) displays run on two Raspberry Pis : one for each display. The Pis run a lightweight network protocol to render the cockpit displays remotely. Any older PC or mobile device (iPad, Android phone) can also run a display by running the same software.

100% of the software is free and open-source.

The gear lever panel and glare-wing buttons / lamps are interfaced by a custom electronics board to an I2C-GPIO expander on one of the Raspberry Pis. This is controlled by a simple custom program to another FlightGear network protocol, which allows the lamp state, gear lever and buttons to be monitored and controlled.

The MCP and radio panels are standard GoFlight hardware, interfaced to the USB-HID input layer in FlightGear. All configuration is via simple XML files, no custom software is needed.

All secondary electronics (USB hubs, network switches, the Raspberry Pis and lamps) are powered from two additional power supplies. This simplifies wiring and increases the system power efficiency.

The throttle quadrant is temporary, the goal is to replace it with a custom-built module soon, with stepper-motors giving actual servo movement when the auto-throttle is engaged.

The seat is a real aircraft part, from a BAe 146. The seat rails were custom made since the originals were not available.

Various panels are from CockpitSimParts. The frame is constructed from 9mm MDF with timber bracing. The setup was sized to fit into a small room – without space for large projector screens for example. The floor areas used is 1.5m x 1.2m

The CDU is from FlightDeckSolutions – it’s currently non-functional since work is still needed to interface to the module from Linux without using the proprietary drivers. It will run another remote display and interface via HID, to the CDU/FMS simulation inside FlightGear.

Future plans are to get the flaps / auto-brake panel working, including automation of the autobrake reset.

Another future step is to add dimmable LED lighting. The GoFlight panels are not to scale and lack back-lighting of course, but the CDU and panels from CockpitSimParts could be backlit.

Please ask any questions you might have!