WWII B25 Simulation Project

Noah Irwin
Charlie Penvari
Kala Ahuna
Jonathon Cummings
Joe Tran
Shahd Alali

Project Plan

- Provide Extensive Documentation so that next team has strong code and knowledge base to begin with.
- Select Appropriate Flight Package
- Integrate package with microcontrollers to allow for attachment of buttons, switches, etc.
- Confirm proper B-25 Flight Model
- Create required gauges for the panel of the B-25
- Determine networking computers/raspberry pi’s together

Flight Package

- What Simulator are we using?
  - FlightGear v2020.3
  - Supports most OS (Mac OS, Windows, Linux x86, etc.)
- Why Flight Gear?
  - Problems with other Flight Sims
    - Proprietary
    - Limited Extensibility
  - Collective Effort of Public
  - Sophisticated & Open-flight framework
- General Public License
  - Free to download & copy IAW GPL terms & cond.

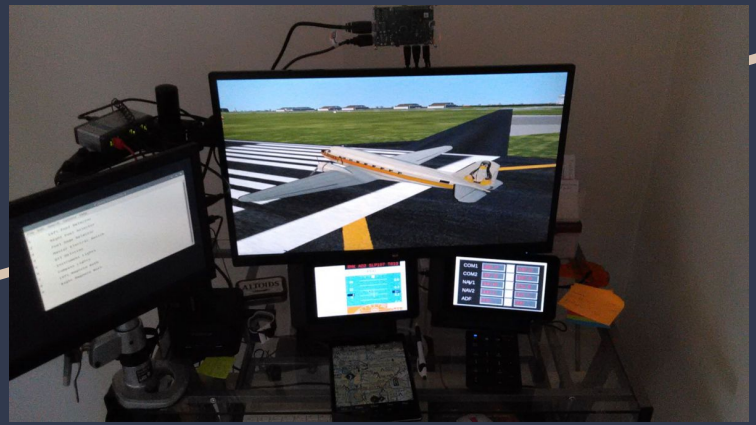
FlightGear Specifications

- Open-Source Capabilities
  - Dev. by programmers around the world
  - Public Contribution
- Multiple Displays
  - Drive mul. Displays on multiple PCs w/master computer
  - 3 cameras on single window w/adjustable param.
- Flight Dynamics
  - JSBSim
    - C++
    - Standalone mode or larger driver w/subsystems
    - XML Config. File
- Networking
  - Comm. w/other programs(Open-glass)
  - Generic I/O; user-defined
  - Multiplayer protocol

FlightGear Attributes

- Sky Model
  - Time & Day Modeling
  - Sun, Moon, & Stars tracking (Computer clock sync)
  - Seasonal effects
- Aircraft Modeling System
  - Model Wide Variety Of Aircrafts
  - Smooth animations
  - Model Cockpits (3-D)
  - Realworld Instrument Behavior
  - System Failures
- Internal Properties
  - Model Animations
  - Sound Effects
  - Instrument Animations
  - Real-world interface
- Modability

Arduino and Raspberry Pi with Flight Gear



- Both Arduino and Raspberry pi are able to interface with FlightGear
- Arduino:
  - Arduino Uno can interface with FlightGear.
  - Can use it to relay switch input to keyboard bindings.
- Raspberry Pi:
  - Can use the Raspberry Pi 4 to run the simulation
  - Can use Raspberry Pi 3A or 3B with the screen to display gauges.
  - Avare: aviation app that works with FlightGear.
- Both:
  - Can use joysticks/yokes

Preliminary Costs: Demo Simulator

Assumptions:
- Top to bottom with no equipment
- Does not include mounting solution.

Item	Cost ($)
Computation	
- Main Computer (mid-range) - Arduino Uno	$900 $30 x 2
Displays	
- 27 in. 1080p Monitor	$210 x 4
Flight Controls	
- Prebuilt yoke & pedals from Logitech/Thrustmaster	$550
Other	$200
Total	$2550