Aftermarket Pilot Aids – Electronic Altitude & Heading Bug

Ryder Nance
EC601
DRAFT FINAL POSTER

Current Instruments:

The Problem - Distractions

Even small climb/descent rates and/or turn rates can lead to significant and potentially dangerous pilot deviations if left unchecked

Stratux

Small Raspberry Pi driven open-source aviation ADSB receiver. Allows a pilot to receive live traffic and weather information in the sky, as well as AHRS (Altitude Heading Reference System) data.

POWERED BY Raspberry Pi SPI I²C BUS

Plan A – Process Data on Stratux
Plan B – Secondary Raspberry Pi processes received data from Stratux
Plan C – Implement sensor system from scratch

adafruit

Implementation

Aircraft Audio Stack

Raspberry Pi

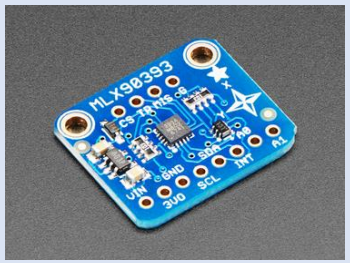
Pilot's Headset

Operation

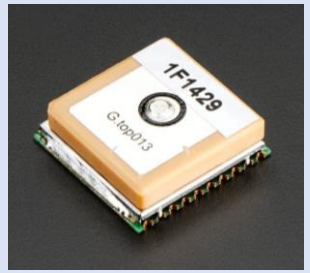
The pilot sets the SLP in the beginning of the flight, and then sets the desired altitude and heading via a web interface. The system provides audio warnings when the pilot deviates from the assigned heading or altitude.

Sensors

Barometer:
Calculates the altitude by subtracting ambient pressure from preset sea level pressure



Magnetometer:
Calculates the forces from the earth's magnetic in the X,Y,Z directions in uT.



GPS:
Provides backup heading information based on velocity trajectory