Multiple Prop Phase Control

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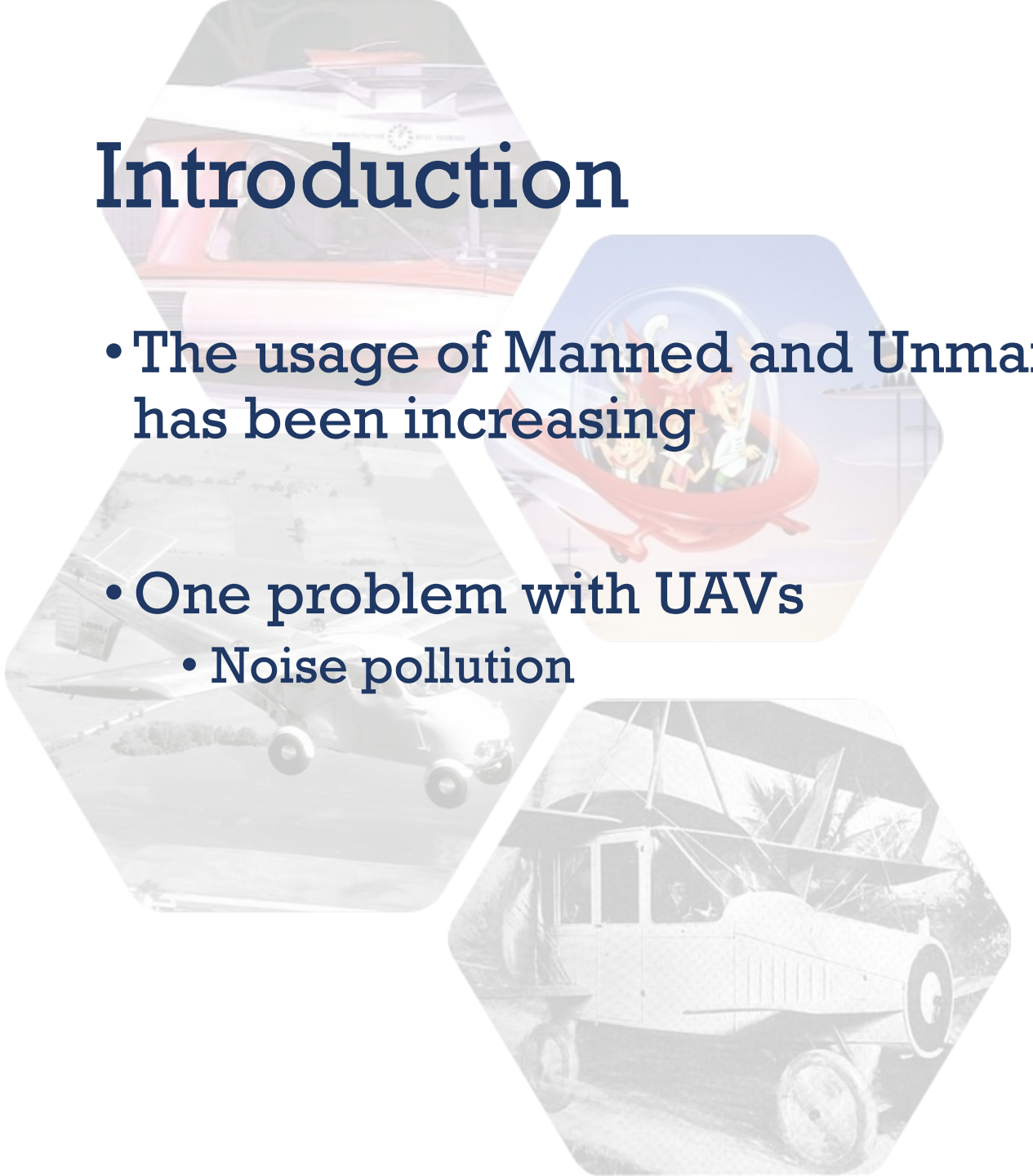
Introduction



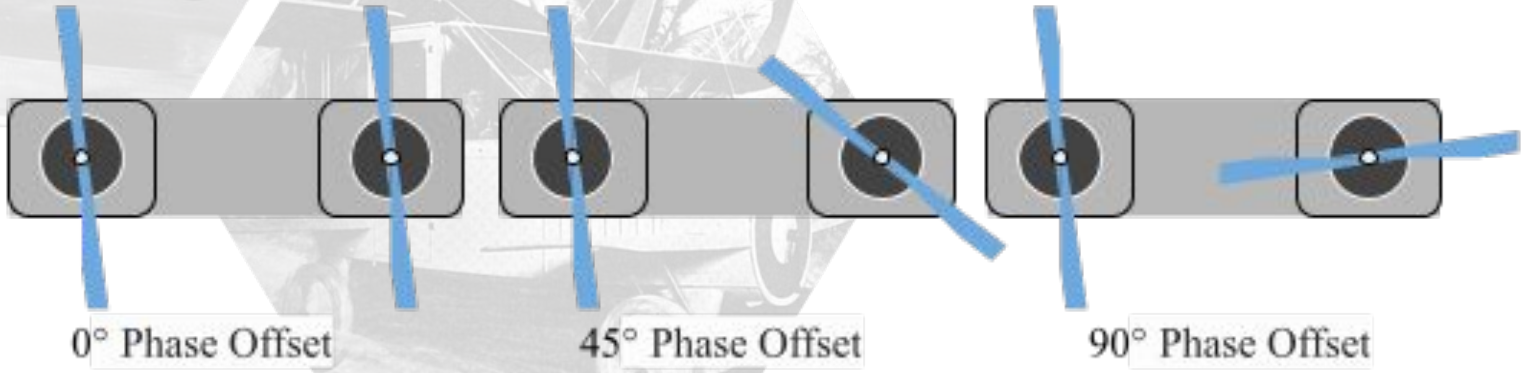
- The usage of Manned and Unmanned multi-rotor air vehicles has been increasing

- One problem with UAVs
  - Noise pollution

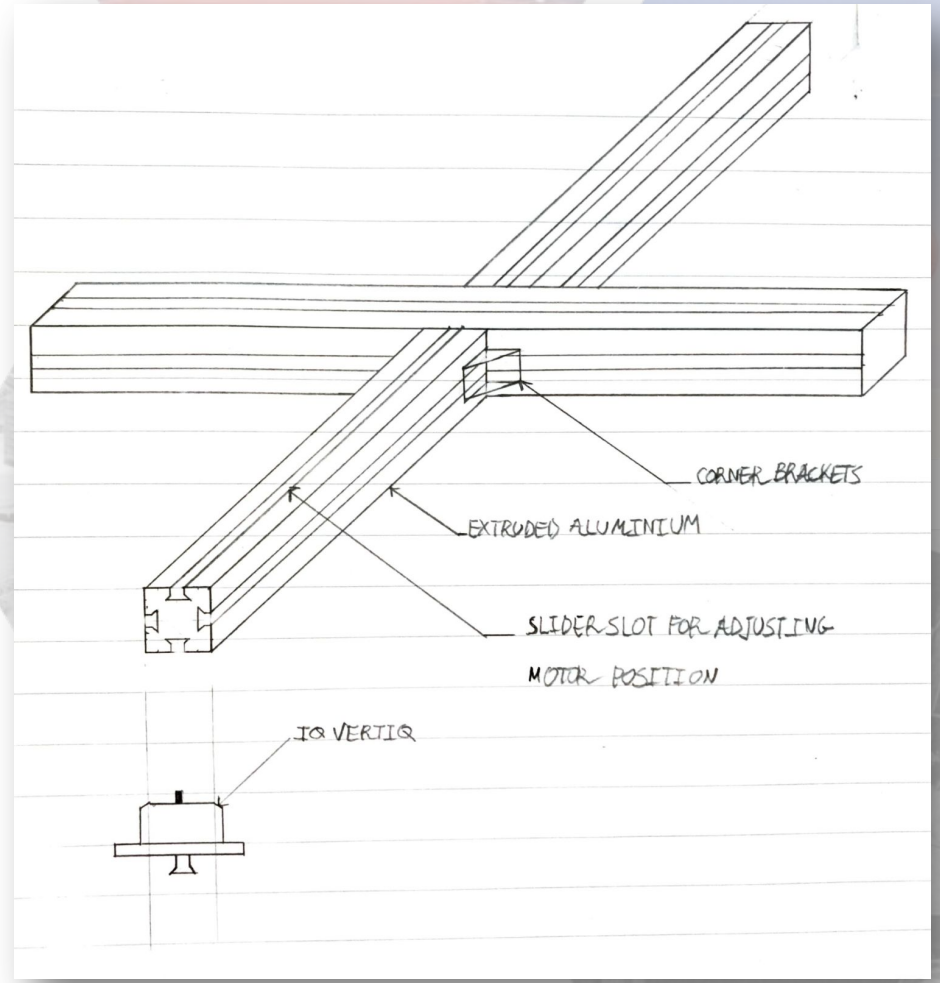
Project Objectives

- Develop a test rig and an algorithm that allows us to experiment with the UAV noise attenuation theory

- Obtain noise attenuation measurements.

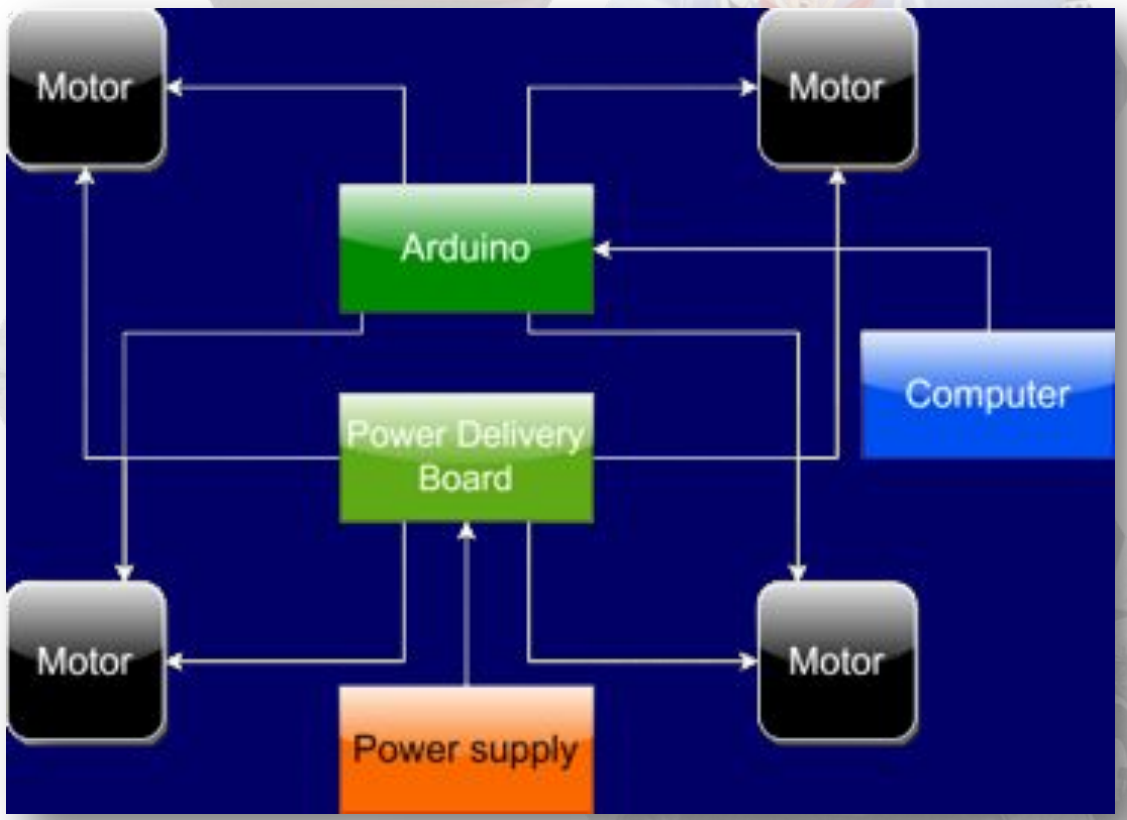


Design (Frame)



- Cross Shape Design
- Test rig will be built using extruded aluminum
- Motor position can be adjusted along the axis of the arm

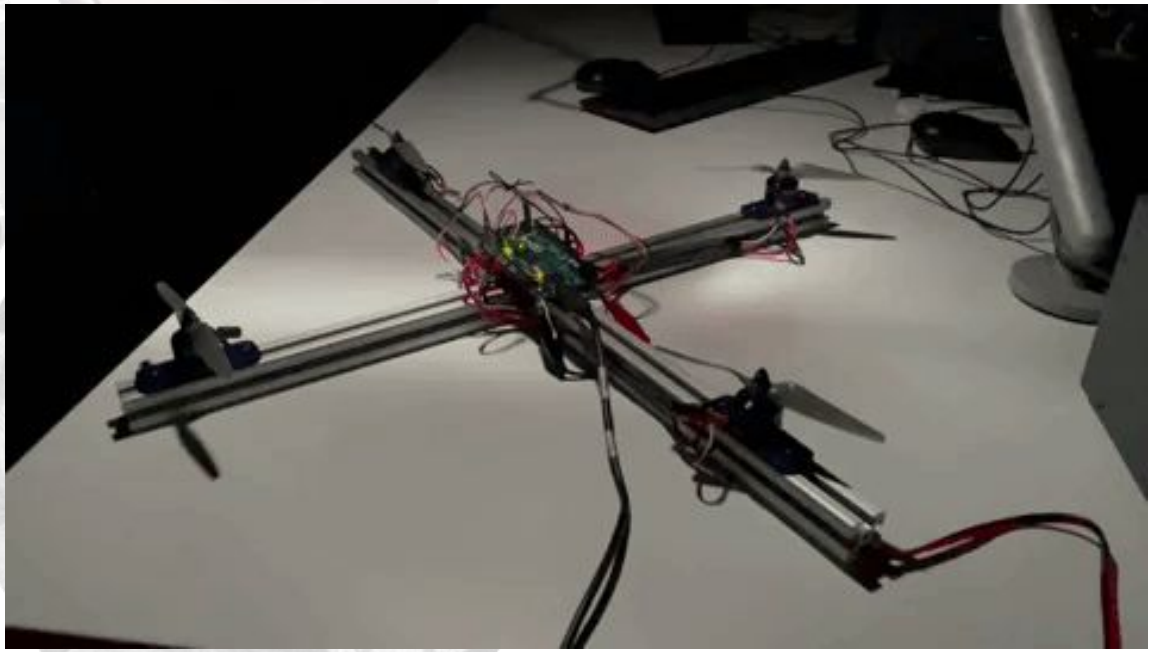
Final Hardware Design



- Arduino and power delivery board set in the center on a 3D printed mount
- Code uploaded to Arduino via USB
- Serial communication between Arduino and motors

Main Problem

- Commanded RPM is not the true RPM nor consistent with each motor



Algorithm

Utilizing a virtual leader motor, PID produces a new velocity command to synchronize all four motors in respect to the virtual motor