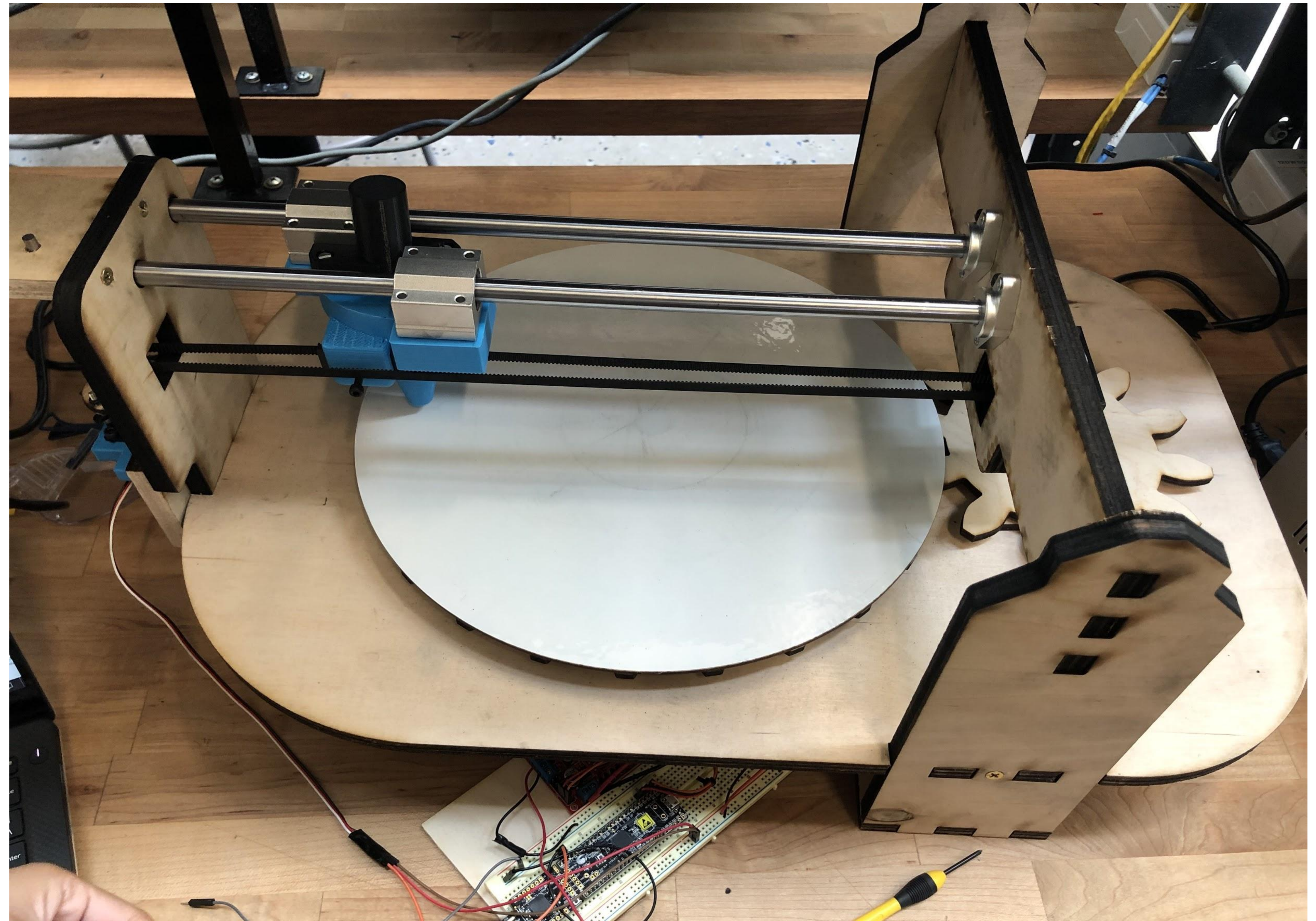
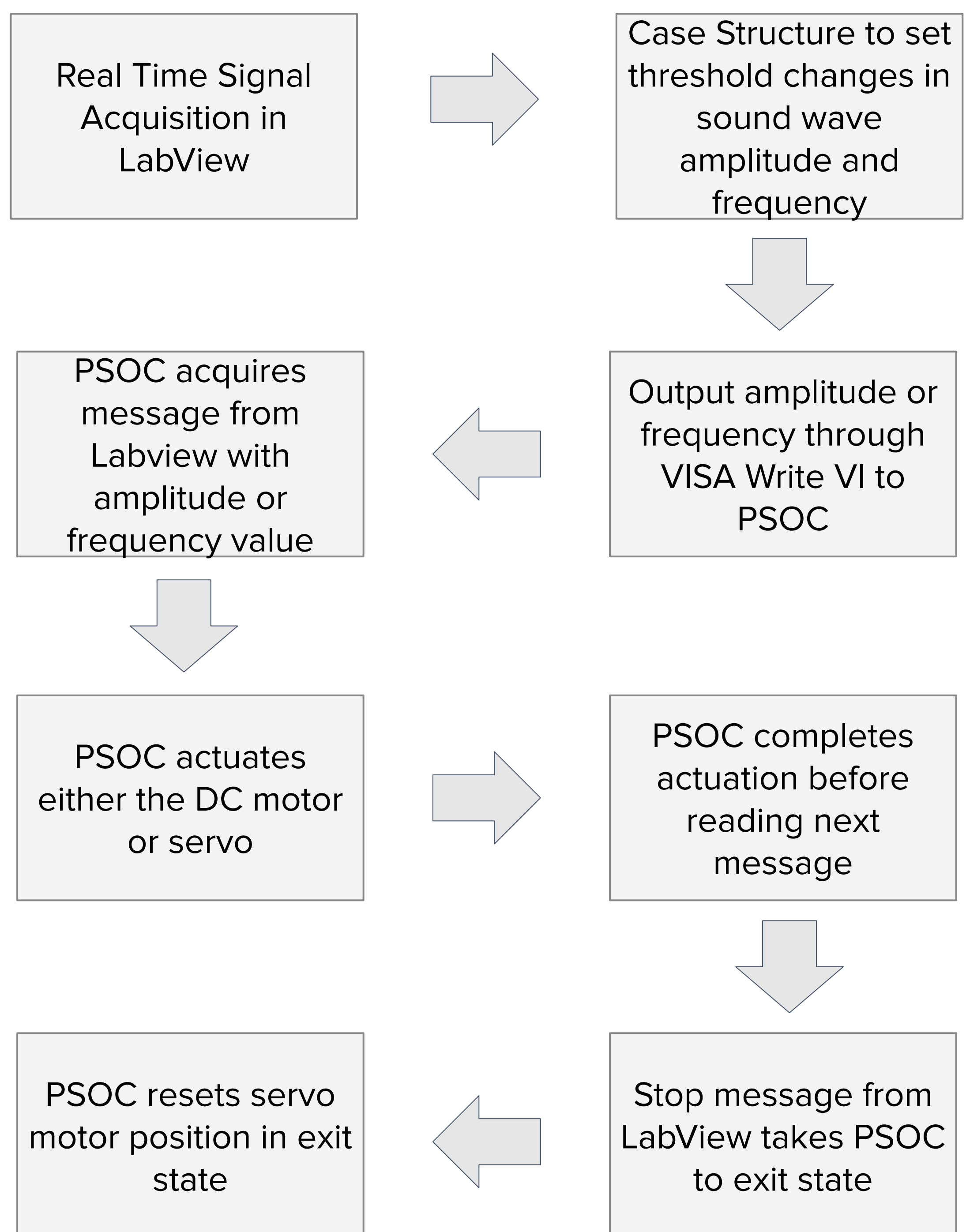


Turntable drawing machine that is actuated by real time sound wave processing

Data Flow Diagram



Real Time

Design Goal: To process a sound wave in real time to drive a mechanical visualization with minimal delay and uniform time steps

Implementation:

- Continuous sampling of incoming sound wave
- Sound Input Configure VI, Sound Input Start VI, Sound Input Read VI
- Sampling time is less than 50% of processing time
- Output amplitude vs frequency and time as waveform graph
- Serial communication between PC and PSOC

Multitasking

Design Goal: To decide task priorities between processing sound wave frequency and amplitude for drawing machine actuation

Implementation:

- Continuously running SubVI within a main VI
- Simultaneous plotting, processing, and acquisition of incoming signal samples
- Case structure for tradeoff between sending amplitude or frequency value based on threshold
- PSOC serial reading and motor actuation
- Serial communication between PC and PSOC

Mechanical Assembly

Design Goal: To visualize a sound wave through mechanical system

Features:

- Change in frequency actuates a servo motor that drives a belt to change pen position along the turntable
- Change in amplitude actuates a 12V DC motor to increase or decreases the rotating speed of turntable
- Driver gear system with a lazy susan allows for rotation

Manufacturing:

- Laser Cutter
- Type A 3D Printer