

Page Flipper

Flippin' Archivists

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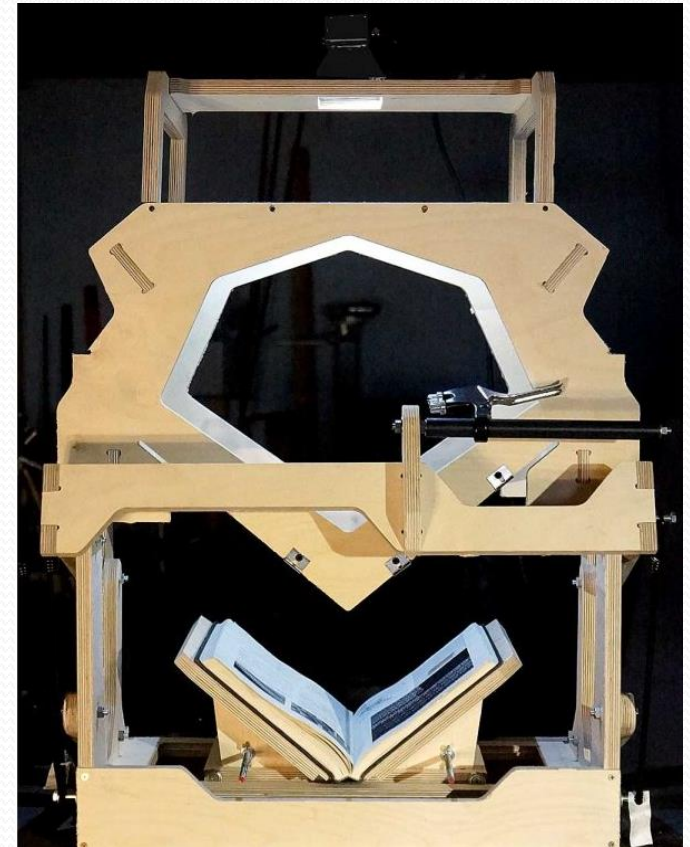
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This project is designed to be an add-on to a do-it-yourself book scanner, automating the page turning process.

Project Description and Rationale for Project Selection

- Automated page flipper
- Add-on to DIY book scanner
- Time saving
- Better organization & space saving
- Easier to store and move



Project Specifications

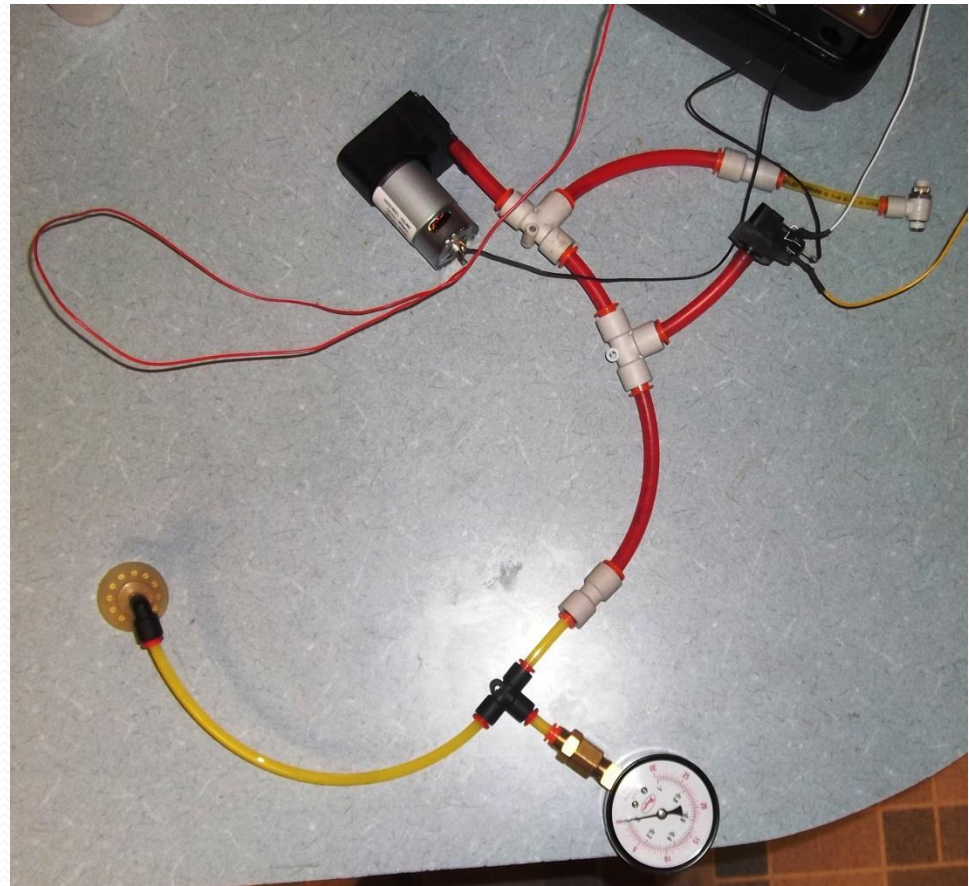
- **Open Source Standards and Hardware**
- **Expandability**
 - **To Include Full Automation**
- **Page Flipper Rate**
- **Physical Space Constraints**
- **Robotics**

Project Resources

- **Online Forums**
- **Data sheets/application notes**
- **Various control systems text**
- **Industry Experts**

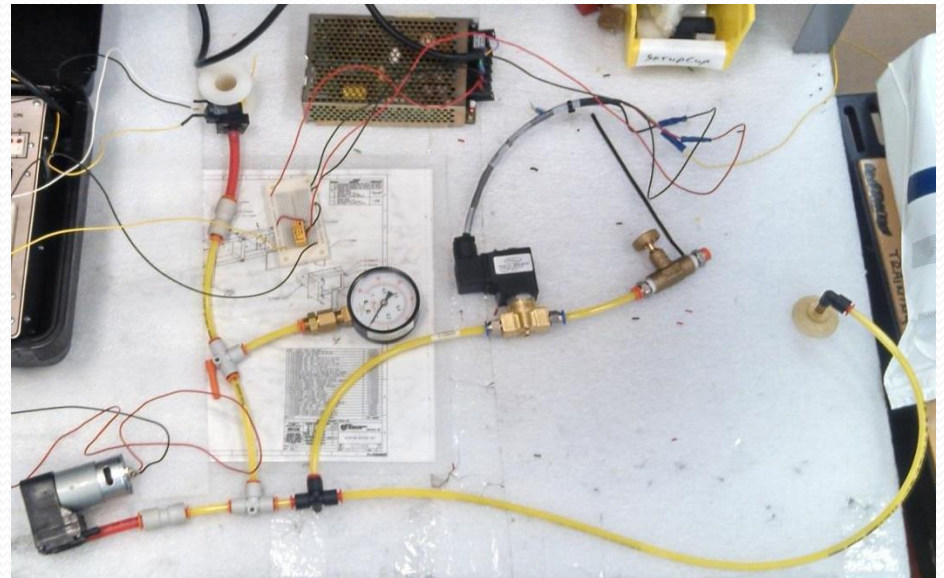
Initial Vacuum Design

- Vacuum Pump
- Vacuum Gauge
- Vacuum Pressure Sensor
- Suction Cup
- Needle Valve



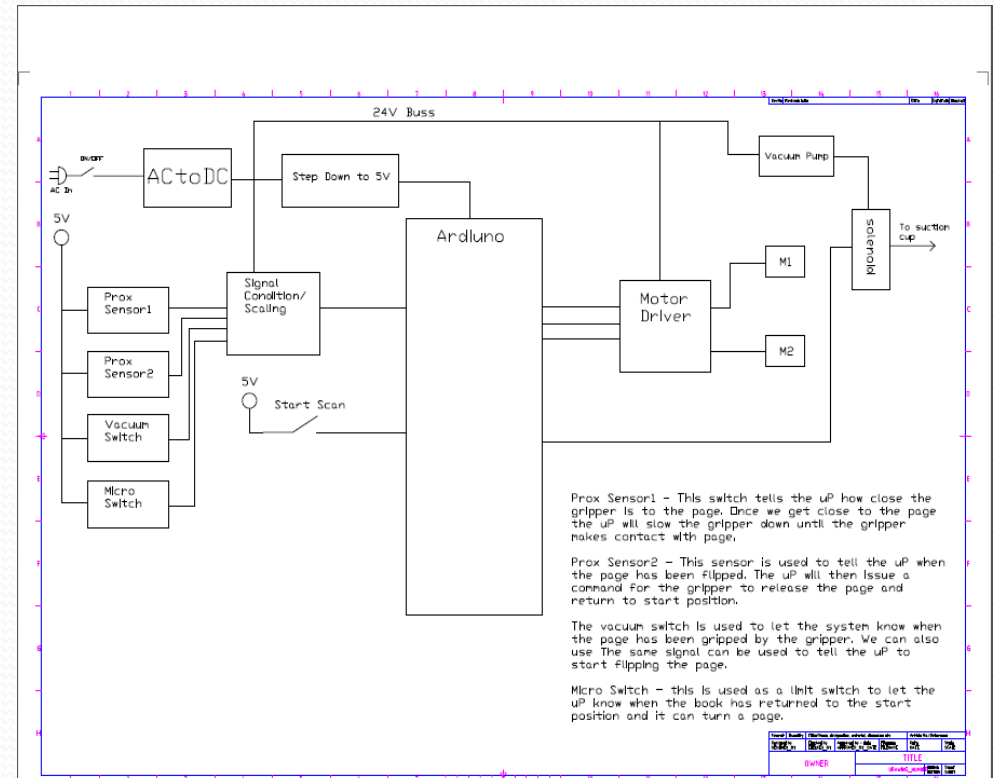
Final Vacuum Design

- 12 V DC Vacuum Pump
- 24 V DC Vacuum Solenoid
- Vacuum Pressure Sensor
- Needle Valve
- Component arrangement



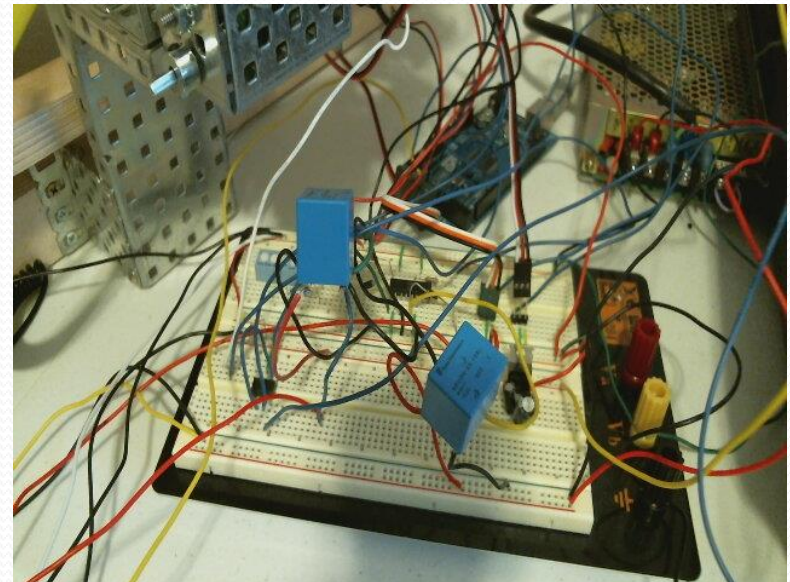
Initial Mechatronic Design

- Two Motors
- Custom H-Bridge
- Analog Proximity Sensors
- Vacuum Switch
- Vacuum Solenoid
- Microswitches
- Arduino Controller
- Signal Conditioner
- Power Supply



Final Mechatronic Design

- Two Motors (One Motor and One Servo)
- ~~Motor Driver~~
- Page Prox Sensors (Microswitches)
- ~~Signal Conditioner~~
- Vacuum Switch
- Vacuum Solenoid
- Vacuum Pump
- Vacuum Opto-Isolator /Relays
- Microswitches
- Arduino Controller
- Final Page Switch
- Power Supply



System Testing

- Servo Motors
- Proximity, Micro, and Vacuum Switches
- Robotic Main Arm & Upper Arm
- Vacuum System
- Arduino Program

Lessons Learned

- **Interaction of physical & electronics systems**
- **Microcontroller technologies**
- **Robotics components**
- **Arduino Programming**
- **Subsystem Testing**

Future Improvements

- **Immediate:**
 - Solder mount discrete components on PCB
 - Mount microcontroller and vacuum assemblies
- **Longer-term:**
 - Design automated book lifter
 - Design automated camera triggering circuits



Prototype Demonstration