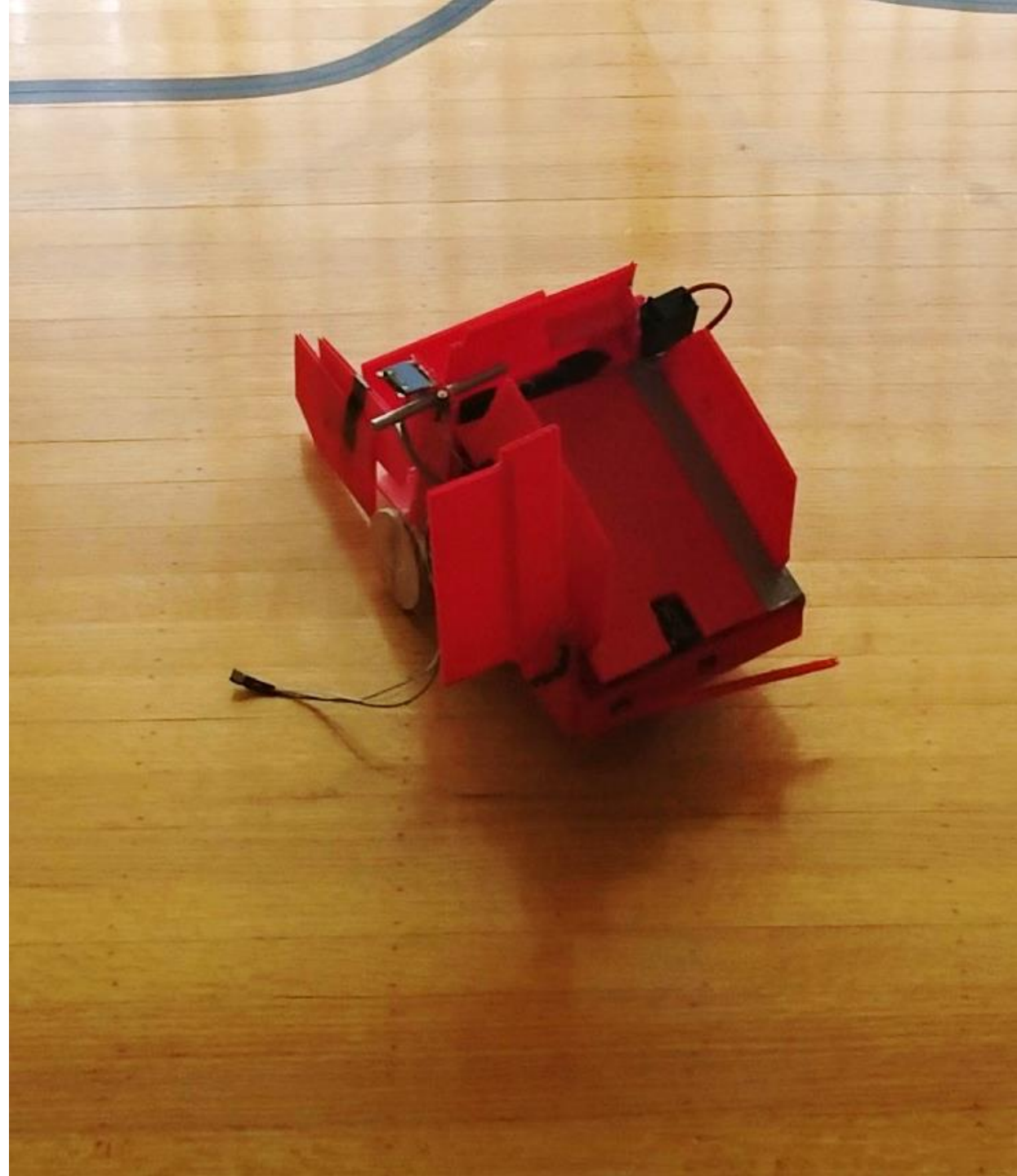


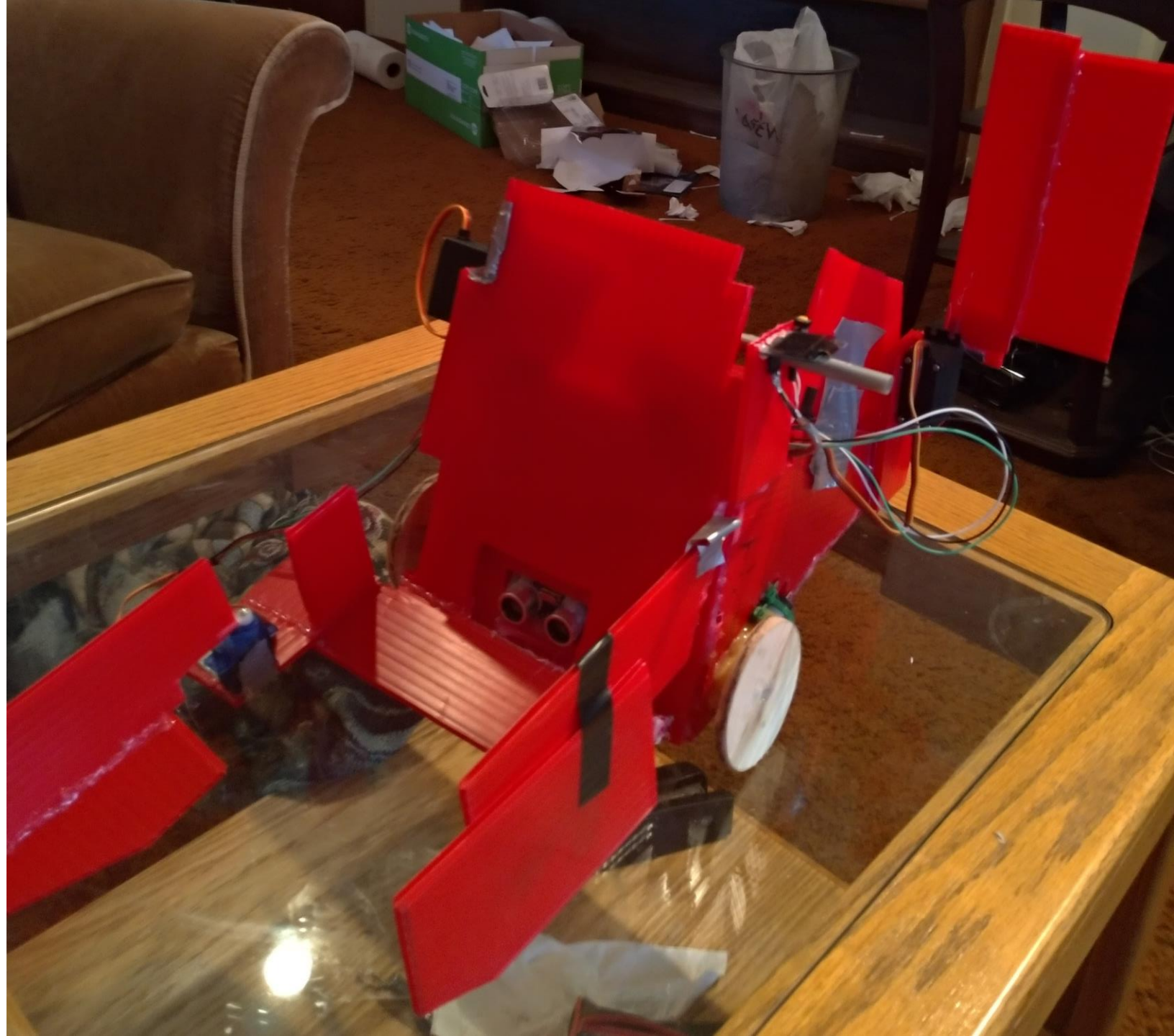
ENPH Robot Summer
2020
pop can collection bot

Dante Prins
Team 16



Front View of Robot

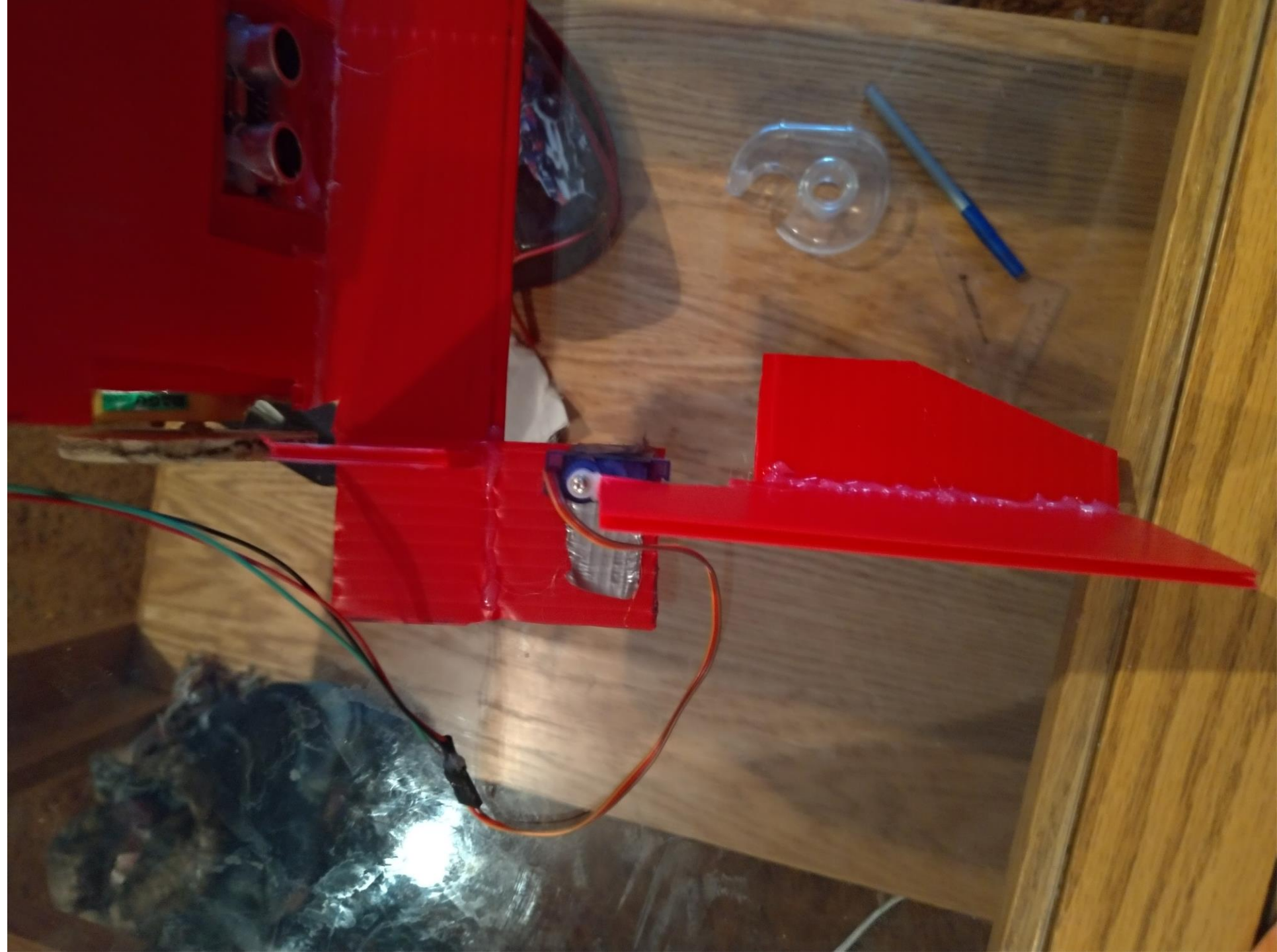
Front claw sweeps inward to
collect can within the two
front arms



Front Claw

initially aligned with
tape before being glued.

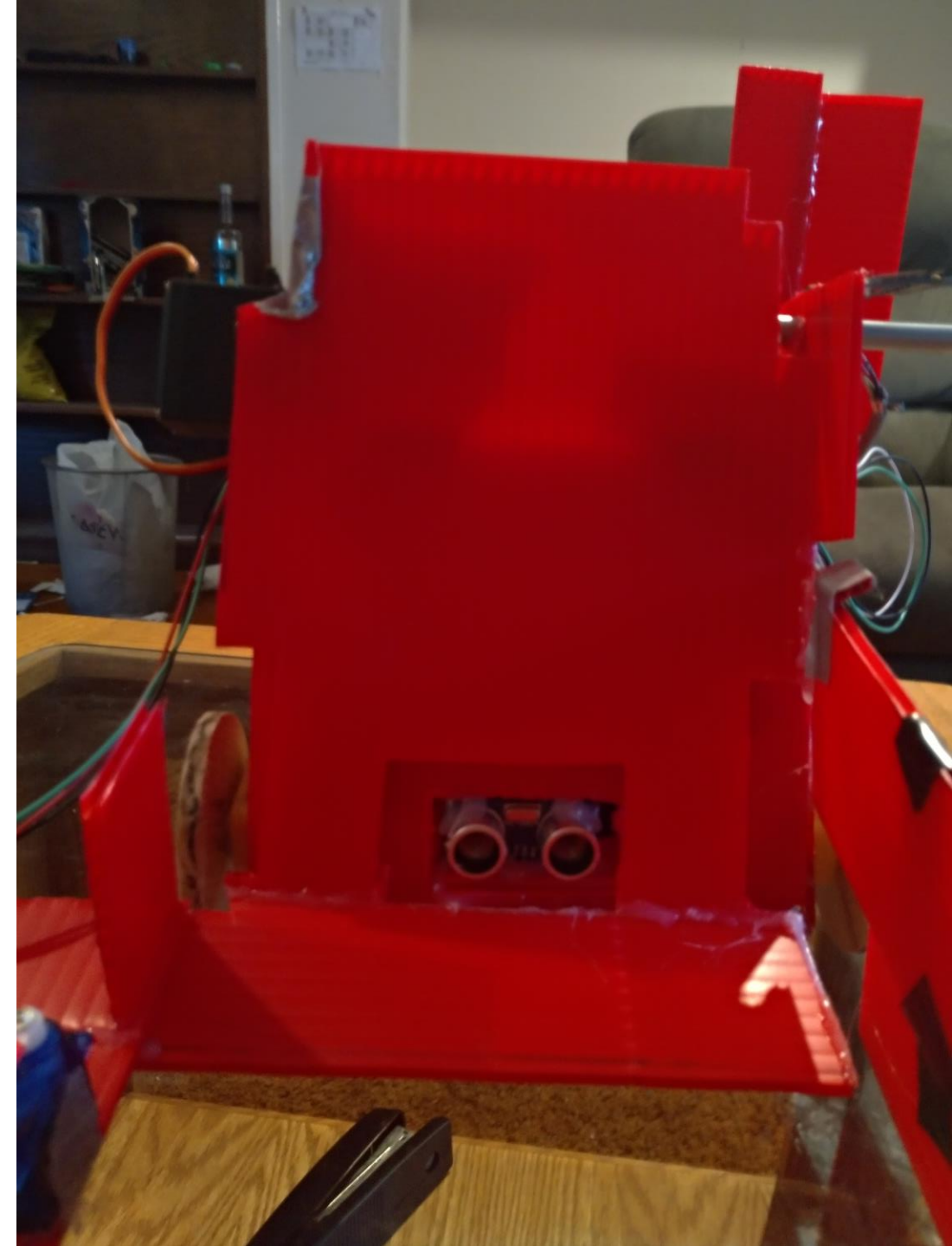
Designed and tested to
sweep cans of all
orientations onto the
lifting lip.



Closer View of the Front Lifting Arm

Sonar peeks through front hole to sense cans.

Designed to be low to the ground without causing friction.



Side View

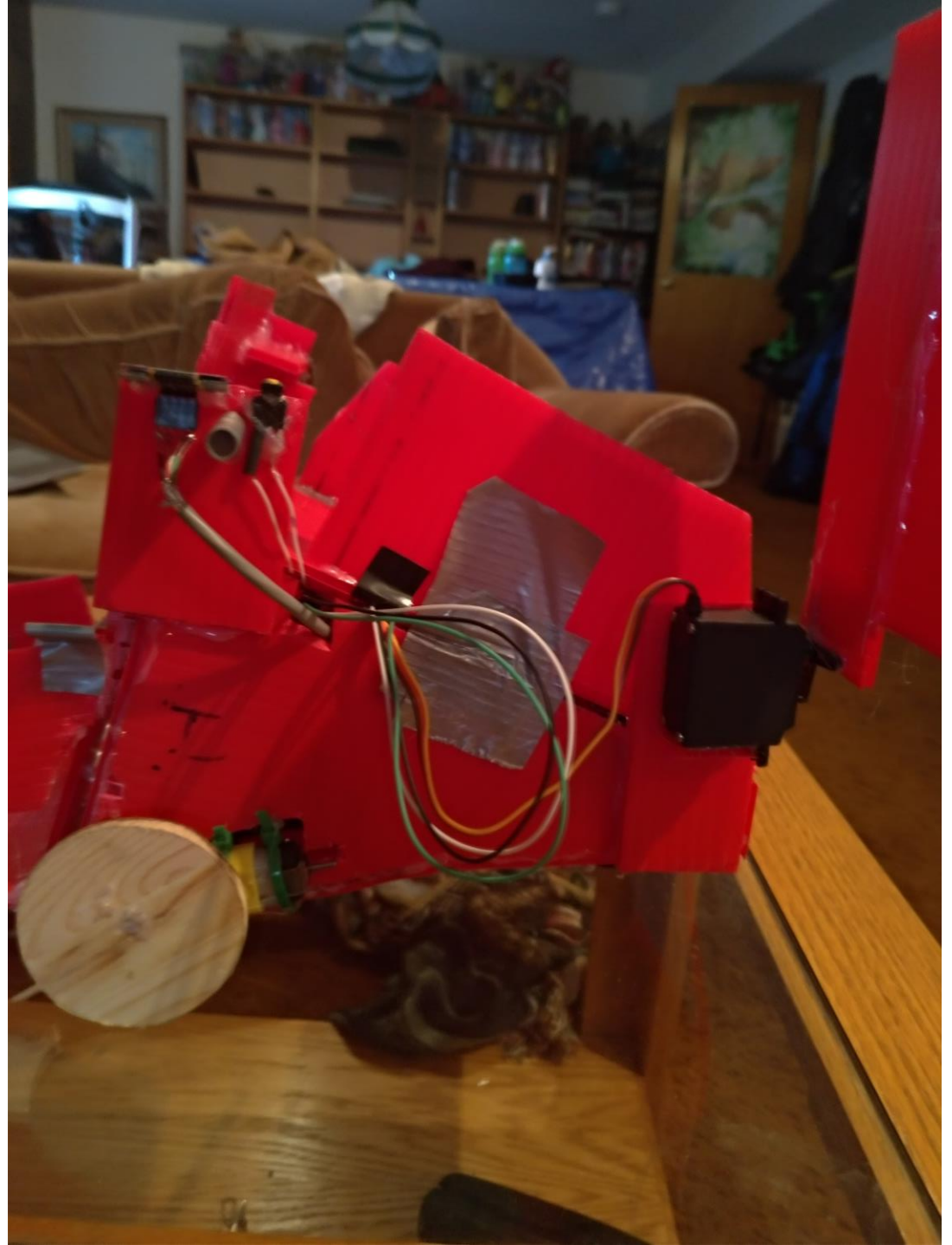
Wheels were cut from 1/8in wood and mounted with glue.

Motors secured with zip ties and small amounts of reinforcement glue.

Rear caster not visible below near the back.

all external wires exit through a single hole.

Tape is used to secure the lid which flips open to gives access.



Bucket View

Rear gate (pictured open on left) keeps cans held until reaching bin and rear switch is triggered.

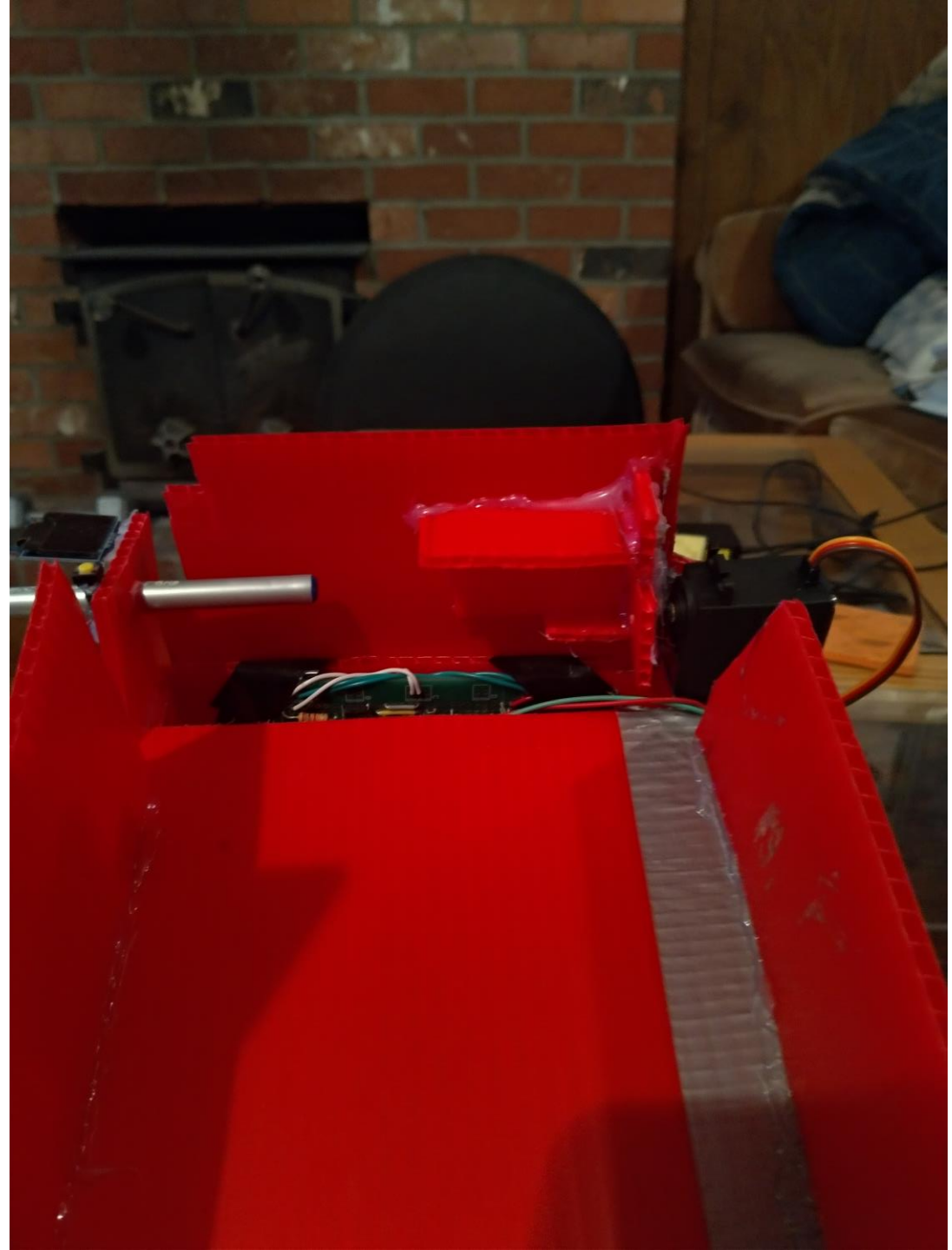
A rear tape sensor had to be replaced with switch because sunlight was falsely triggering it.

Tape hinge on the right folds out to right, revealing the inner circuits.



Front Arm Mounting

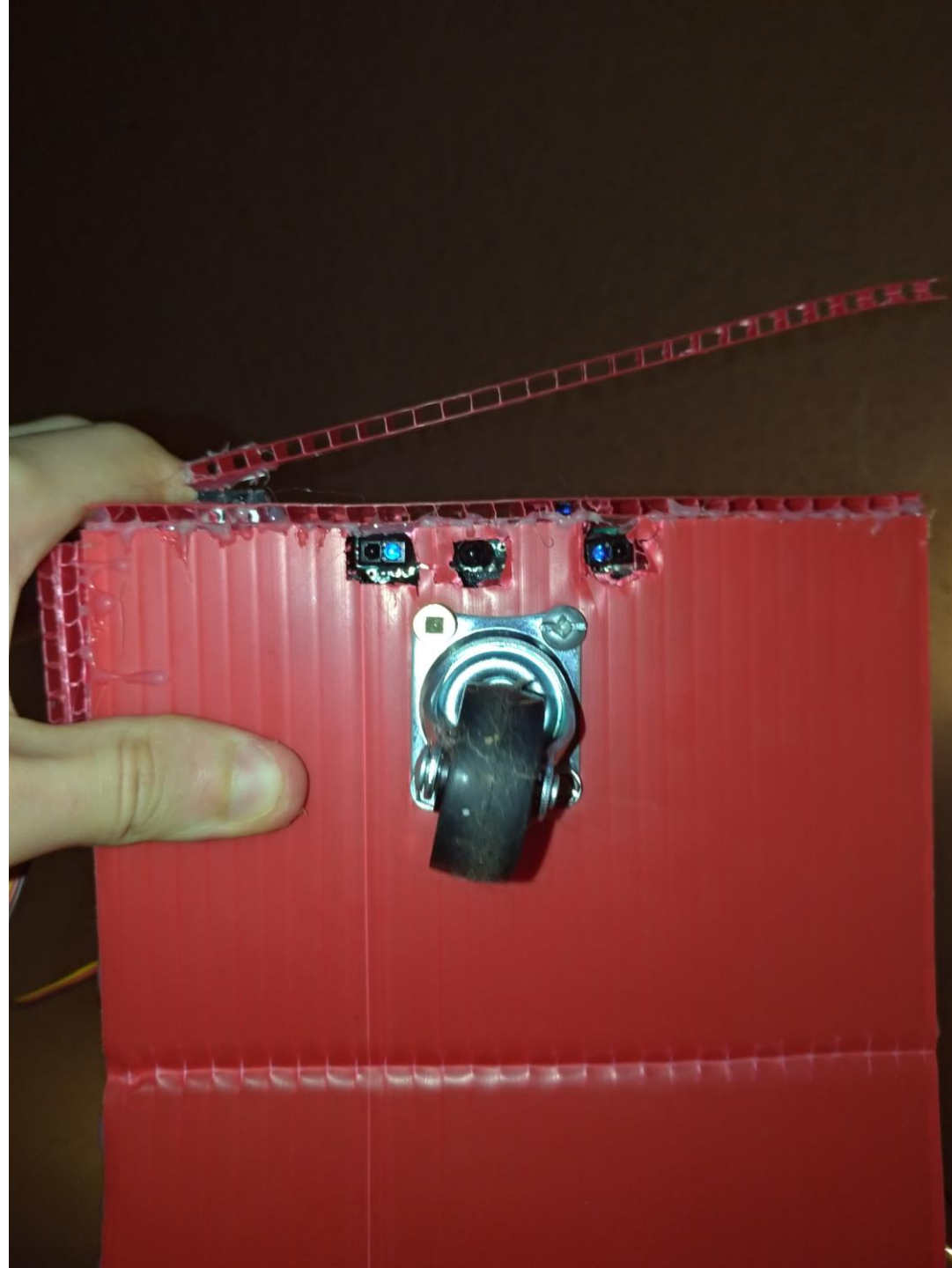
Servo mount created from plastic and attached to solid front arm piece. Inserted ballpoint pen used to prevent deflection on the left side of arm while in upward position, imitating the behavior of a solid hinge.

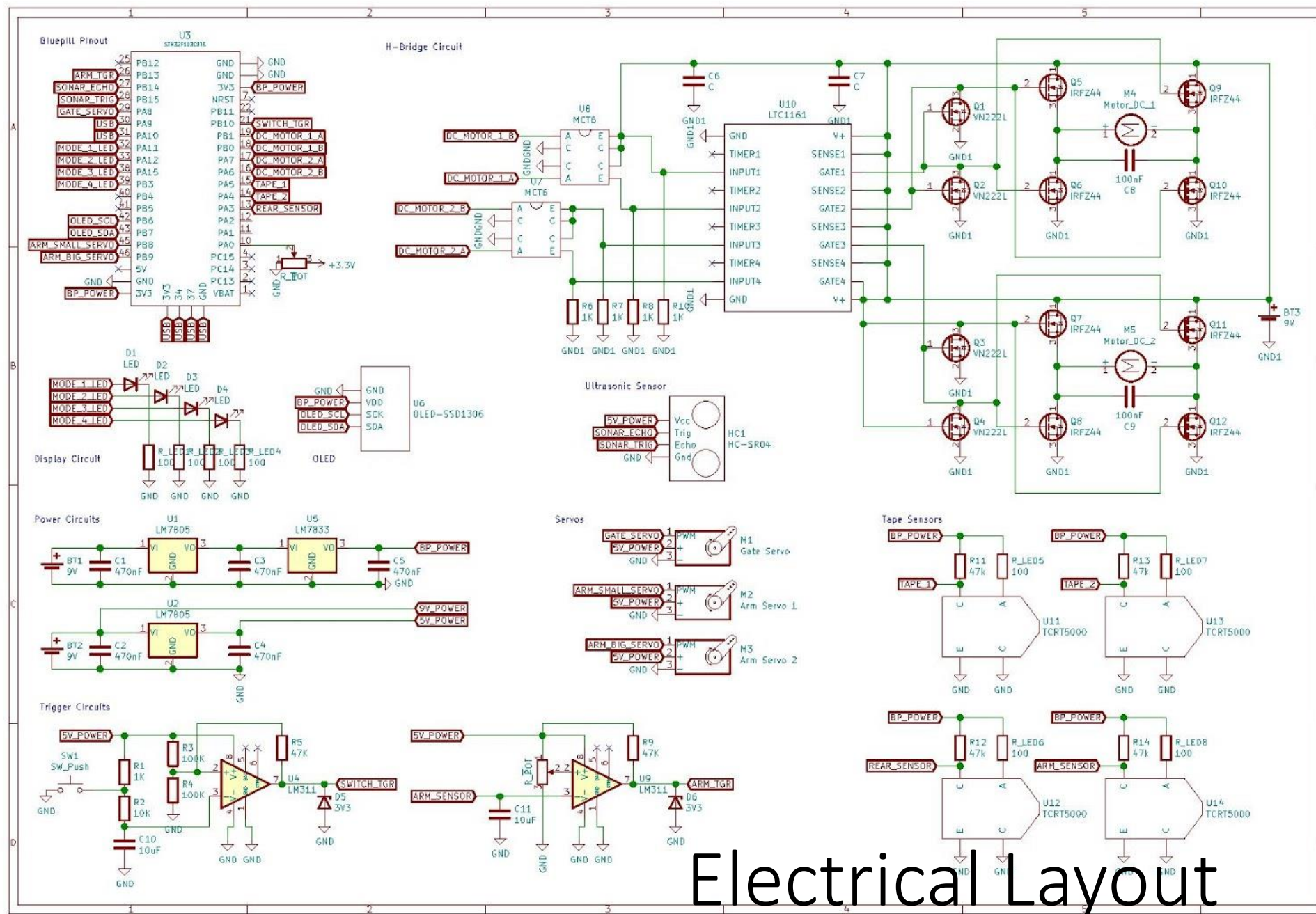


Tape Sensor Array

2 side guard tape sensors and a standalone center phototransistor that tracks tape using light from the two sides.

Rear wheel was attached with screws and washers on the top side.





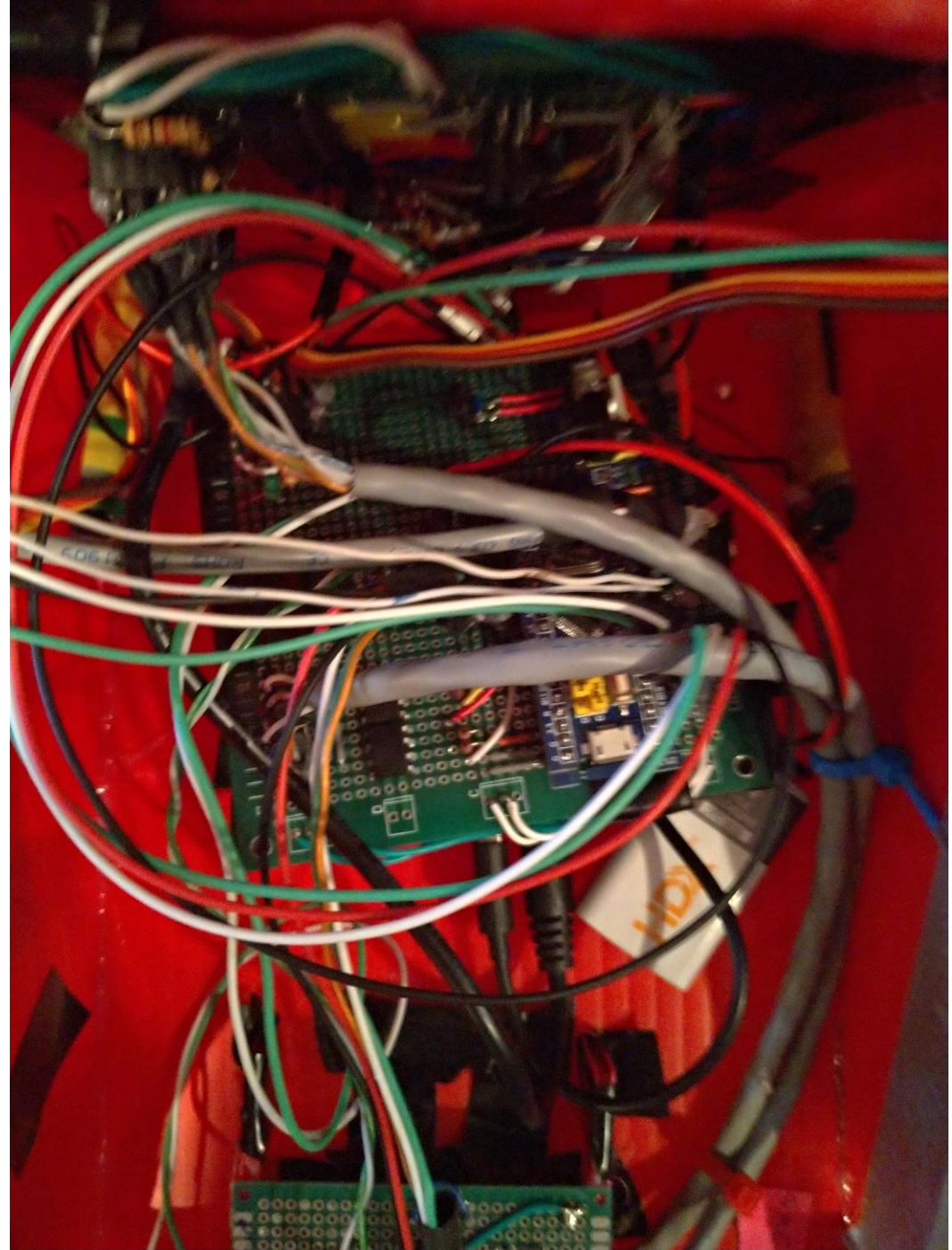
Internal Cable Routing

H-bridge (top)

Control board (middle)

Tape sensors (bottom)

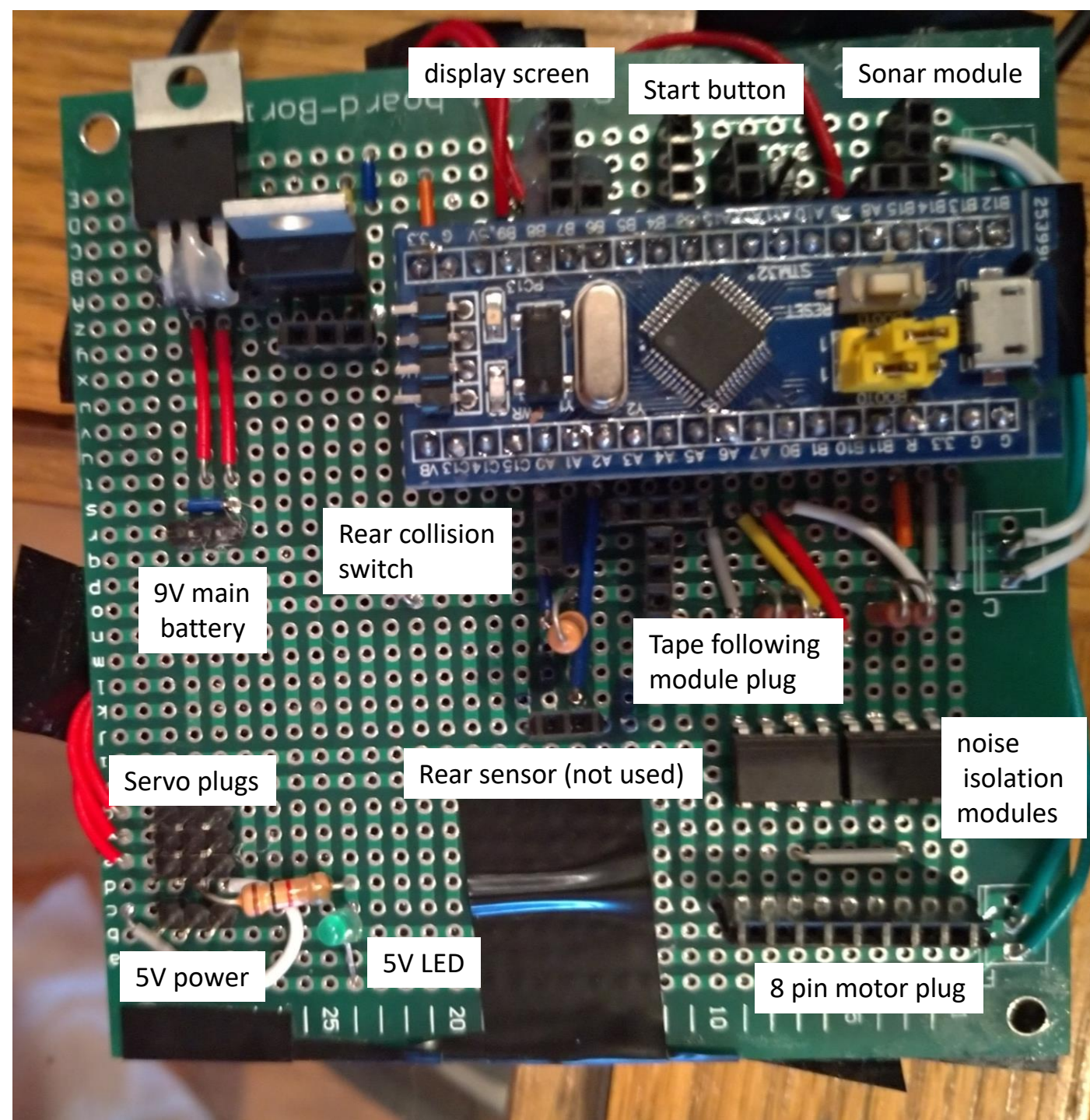
All cables were measured and cut to right length, excluding the motor cable which was zip tied.



Control Board

Ground/power/ground rails with plug symmetry

All used pins are different shapes and cannot be plugged backward, excluding motor and servos

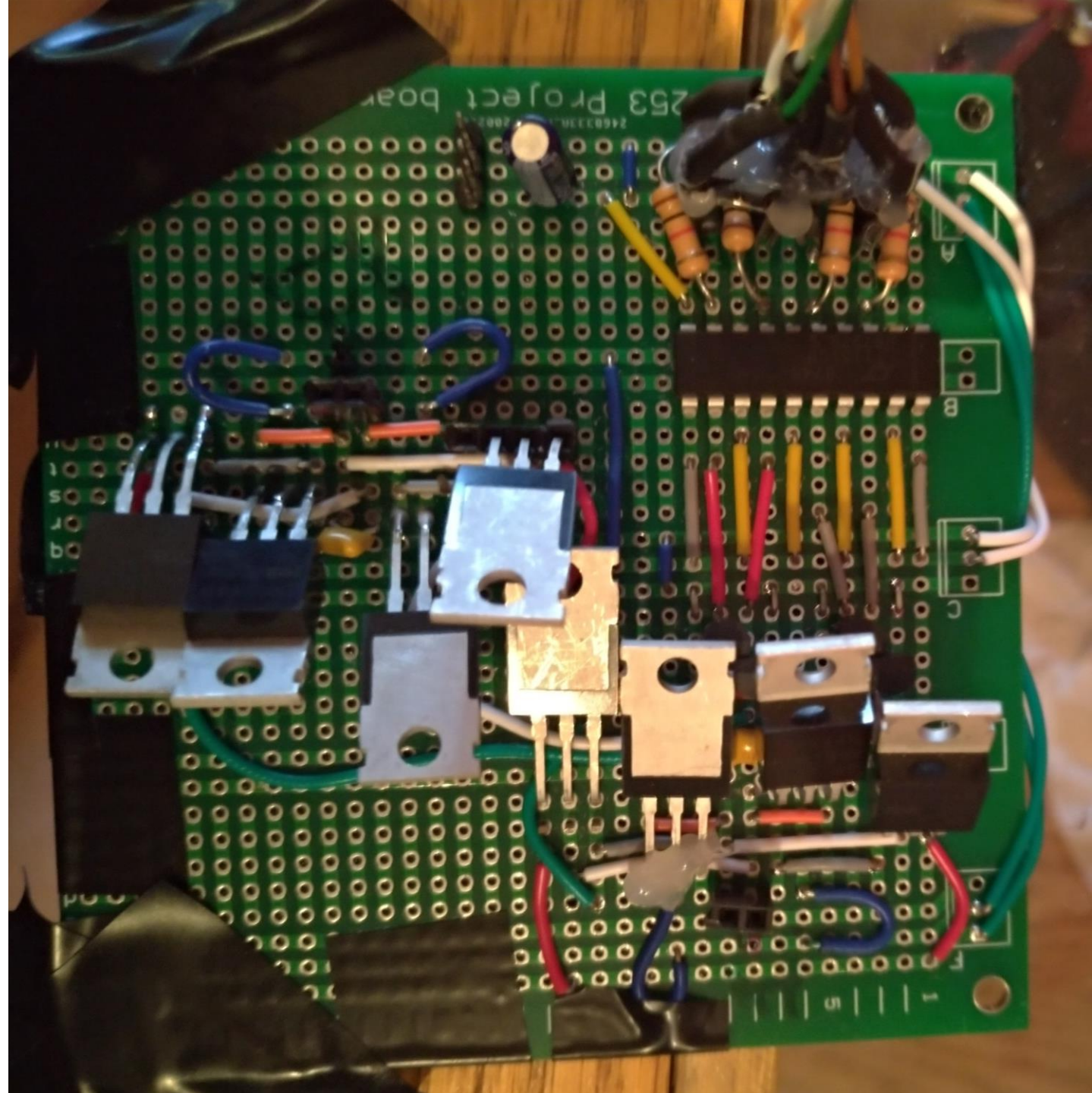
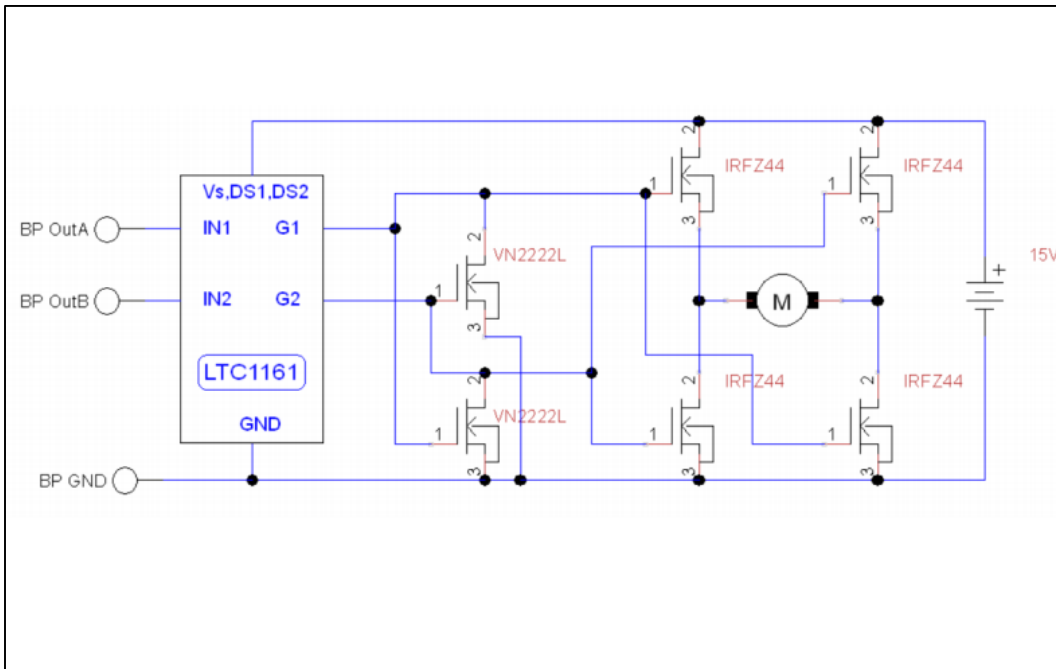


H-Bridges

Ground/Power/ground rails with plug symmetry

Space was saved with a symmetrical H-bridge design with 2 inverted MOSFETS (center)

8 pin plug was colour coded with white as power, coloured as signal (top right)



3 Tape Sensors + Rear Sensor

Soldered extensively on both sides.

Space was limited by wasted pins created early in the term from solder practice.

Required very technical soldering to make up for this.

