Fast and Furious: High Speeds at High Hopes Preschool Progress Presentation

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Amanda McCausland, Nick Jelinek, Will Holder, Taylor Studer

Problem Statement

There currently are no standard power toy cars that are able to be modified for children who have mobility impairments. The current product comes with a non-adjustable seat, only one option for activation mechanism, and one option for steering mechanism. Children who lack the freedom of independent mobility experience the resulting negative cognitive effects such as poor depth perception and cause and effect reasoning. These same children also unfortunately tend to be ostracized by their peers, preventing the development of valuable social skills.

Primary Objective

Mainly, we seek to help the children gain individual control of their mobility. Simply granting them the ability to move about on their own will help them with:

- Conceptualization of cause and effect
- Depth perception
- Cognitive development
- Social development

Solution Description

A power wheels car (6-V battery powered ride-on) with modular components and attachments which will support a variety of conditions. Our car is suited for children younger than 5 years and will have:

1. Safety Features
    a. Torso harness, foam padding, postural supports, possibly a parent handle and brake
2. Plug and Play Inputs
    a. Button to accelerate, steering wheel, handle bars, pressure controls
3. Motivational Appeals
    a. Colored inputs, music, lighting

Needs Assessment

Patient :

- Needs to accommodate children of different sizes
- Must not startle the child during acceleration

Provider:

- Must be able to easily adjust seat for child
- Must be able to easily access battery for charging
- Must be able to adapt car for distinct needs of child

System:

- Can’t compromise original outer structure
- Charger must be appropriate voltage for battery and be used in standard outlet

Measurements/Observations to Consider

Measurement	Modification Effect
Child has a weak trunk and cannot sit up straight	Chair that allows the child to lean back depending on his size and weakness of trunk
Length of the seat is 11”	Track can’t be much bigger than this or it will limit leg space
Width of seat is 14”	Limits where the track can be placed and how wide it can be
Some children are startled by the jolt of a car and become upset	Can’t have the natural acceleration jolt from a 6V standard car

Noteworthy Progress

- "Creating a whole plethora of movement options for these kids is important. Anything to make them feel typical." - Nancy Darr
- New material ideas (doorbell for head control?)
- No headstrap
- Amtryke and Rifton
- IRB for past Go Baby Go models at High Hopes
- Bicycle hand brake and handle as viable alternative to unrealistic remote control function
- Scheduled future High Hopes visits to meet with relevant OT/PT/children and established consistent contact pipeline

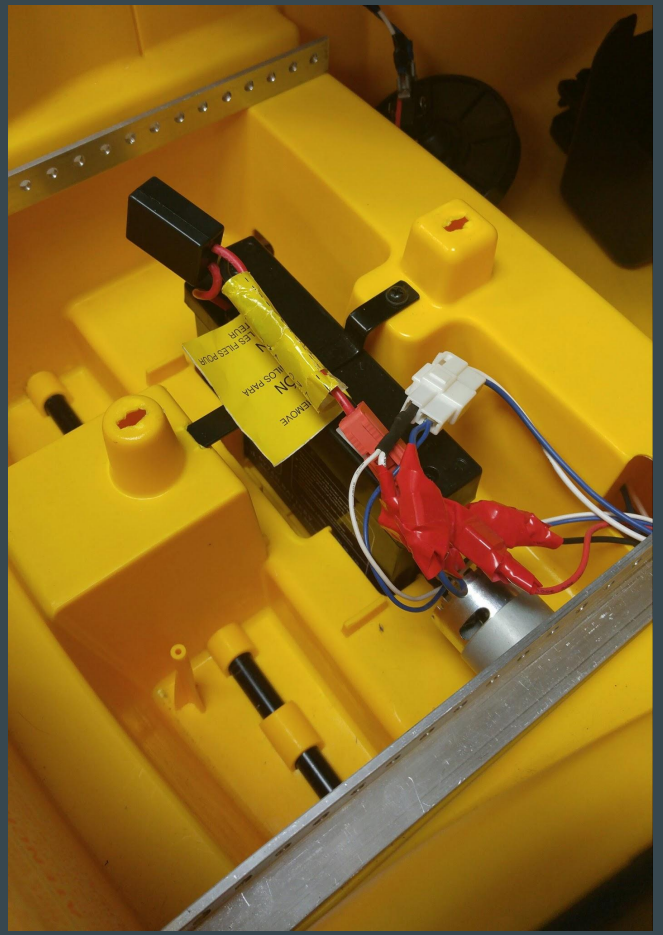
Current Goals

- Wire the car for general function
- Successfully track and plot car battery wiring schematic
- Fabricate seat track and finalise tilt mechanism for chair

Milestone	Deadline	Status
Track construction	Tues Feb 07	In progress
Leg/hip padding	Tues Feb 07	Not started
Seat modification	Fri Feb 10	Not started
Seat tilt mod	Tues Feb 14	Not started
Steering wheel modification	Fri Feb 17	Not started
Motor operation/wiring	Tues Feb 21	Complete
Acceleration options	Tues Feb 21	In progress
Headrest construction	Fri Feb 24	Not started
Armrest construction	Tues Feb 28	Not started
Harness attachment	Tues Feb 28	Not started
Head acceleration control	Fri Mar 17	Not started
Car test-ready	Fri Mar 24	Not started

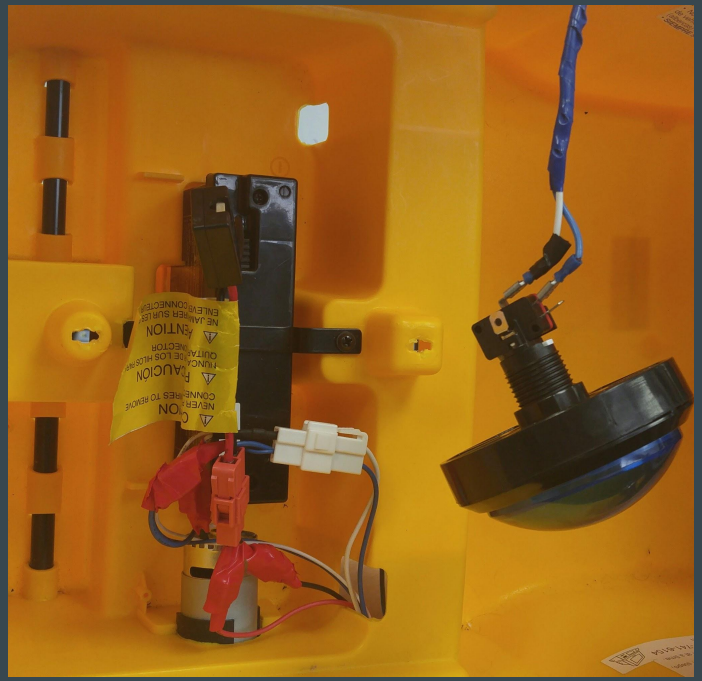
Detailed Progress

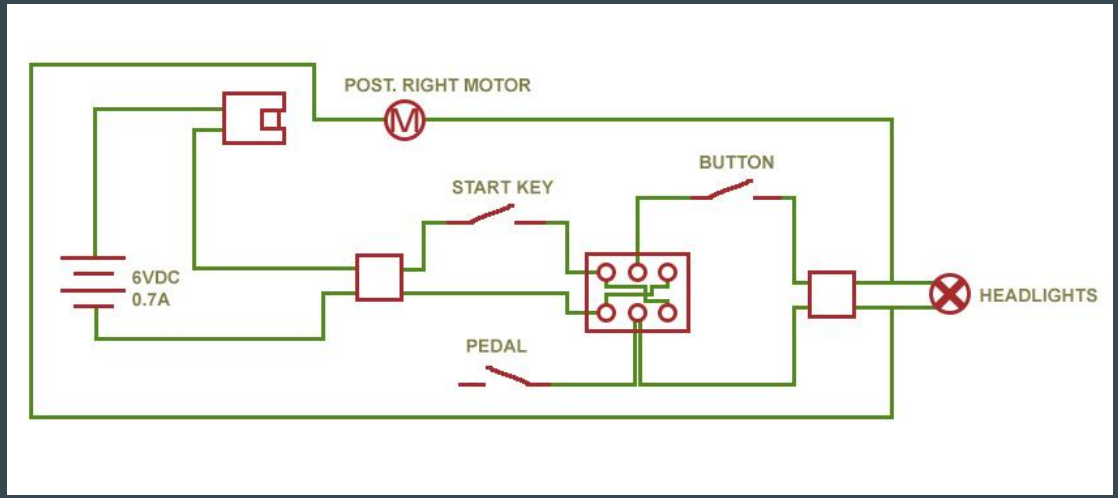
- Ordered specific 6VDC charger from RollPlay
- Successful in re-activation of stock battery
- Settled on 18-gauge wires for future work because of 6V battery
- Bought and custom-machined metal tracking for seat
- Created a schedule of milestones to follow



Updated Version

https://drive.google.com/open?id=0BxOhwN4eB3FmQTZnUkNMOEdXems





Performance

Expected	Actual
Sliding Track for Seat	Use looped screws to anchor the seat into along a 10” track along holes at 0.5” intervals
Fix circuit to get car running	Rewired to activate with attached button
***Head Strap w/ Padding	No head strap - told this is too barbaric
***Remote control for supervising adult	Not able to have a remote with 6V power

Future Goals

- Installation of motor controller
- Update of pending circuit diagram to account for new wiring
- Finalisation of chair tilt design and acquisition of materials necessary
- Finish construction of sliding seat track mechanism
- Shaping and attachment of foam correction blocks for legs and hips
- Acquisition of materials necessary for steering wheel adjustment
- Installation and customisation of safety harness

Comments

- Upload all out pictures to our website
- Keep the kill switch
- Put cost on the needs assessment
- Want to know about charge duration and charge capacity- put that in the presentation

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