



GO-KART – BATTERY GROUP

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Introduction

Nowadays, Go-Karts need to be faster. Our group's capstone is split into two groups. During this process of the project, the battery group embarks on a transformative journey to enhance the Go-Karts battery system.

Design Requirements

- Better battery configuration
- Acceleration of 8 m/s^2
- Put batteries in parallel on Go- Kart to maximize amperage
- 60-minute run time
- Decrease total weight
- Low charge time

Background

- Lead-Acid battery
- 12 volt, 55amp hour, 20 Life cycles
- Weight: 32lbs
- Rechargeable time: 4-4.5 hours each battery with a Runtime of 30 minutes
- Calculations were found by attaching a Pasco wireless acceleration altimeter sensor to the Go-kart.
- The acceleration is roughly 4.5 m/s^2
- A top speed of roughly 20mph
- The total output power of the motor absorbed by the kart was approximately 3.5 kW



Figure 1. Lead-Acid battery



Figure 2. EGO battery

Objectives

- Improve top speed to 35-40 mph
- Improve run time
- Increase acceleration
- Decrease charge time
- Generate 48 volts
- Decrease overall Kart weight
- Improve weight distribution
- Improve steering

Design

Figure 2a below show the kart's weight distribution before and after battery configuration changes. We'll move the batteries from the side to the front to distribute the load evenly to improve steering. It will also be wired in parallel as shown in figure 2b.

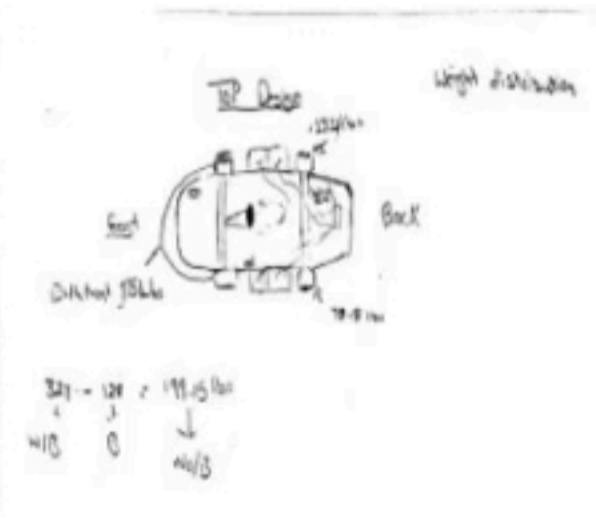


Figure 2a. Distribution calculation & configuration changes

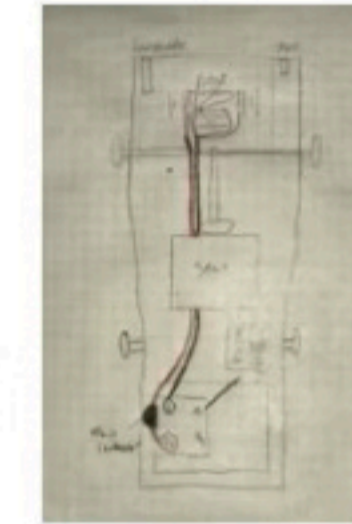


Figure 2b. wiring of batteries in parallel

Results

Figure 3 below, shows a 3D-modeled battery holder for our new batteries. It is lighter than the previous holder and is placed on the front of the kart.

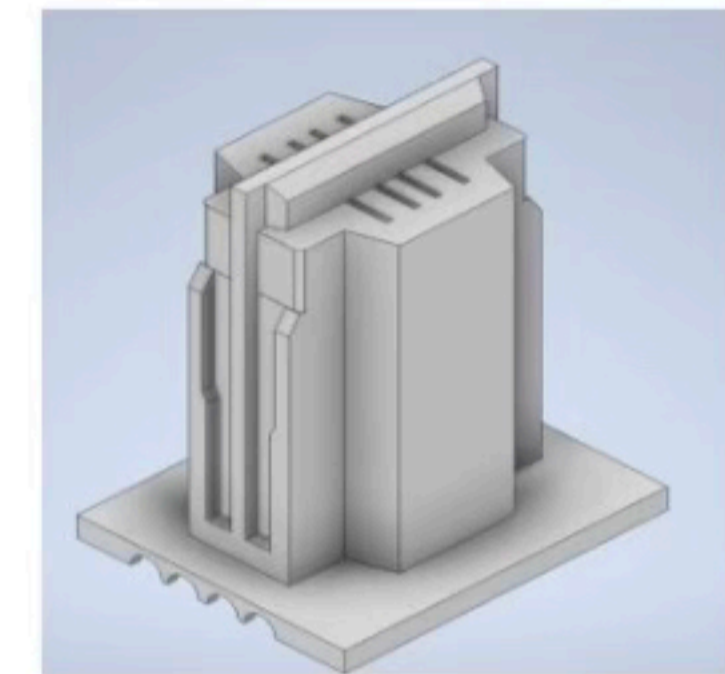


Figure 3. 3D-model holder



Figure 5. Go-kart

Figure 4 below, shows a prototype schematic for a battery voltage display using a 9-volt battery. We plan to replicate it using our EGO batteries.

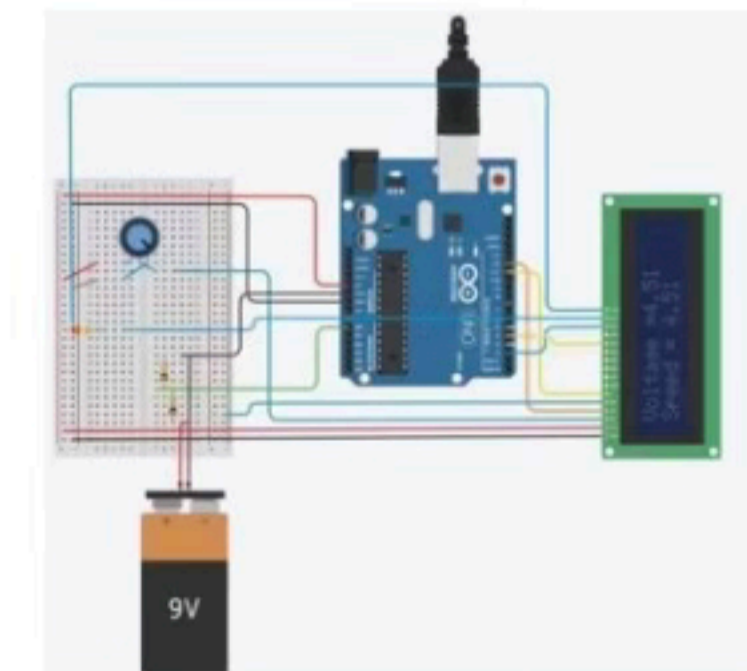


Figure 4. Display of 9-volt battery schematic