The Joe–Kart

BME 4910 Final Presentation

Team 5
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The Joe Kart
Overview

- Introduction
  - Client Background
  - Project Description
  - Previous Work
- Project Overview
- Product Development
- Budget
- Acknowledgements
- Questions
Joey Toce
- 6 Years Old
- 42 inches tall
- 35 lbs.
- Suffers from Mixed Type Quadriplegic Cerebral Palsy with Second Diagnosis of Global Apraxia
- Lives in Southington, CT
Introduction: Project Description

- **Purpose**
  - Design and fabricate a modified vehicle which Joey can operate given his limited motor control
  - Provide an alternate source of recreational mobility
  - Increase time outdoors and out of wheelchair
  - Teaching tool for motor control development
  - Have Fun!!
Introduction: Previous Work

- S–90 Go Kart (Uconn, 2009)
- E–Racer Go Kart (Uconn, 2008)
Project Overview

Specifications

◦ Battery Operated
  • Motor
  • Steering
  • Braking

◦ Remote Control with integrated Dashboard Mounting Capabilities

◦ Adjustable Custom Seat
  • Trunk Support
  • Leg Straps
  • Head Restraint

◦ Kill switch Override

◦ Roll Cage

◦ Left Hand Oriented
Product Development
Power and Transmission

- C40–300 Magmotor
  - 300 Amp, 1984 oz–in Torque, 3000 Peak RPM

- 7.5:1 Gear Ratio in Custom Transmission Box
Steering System

- Powered with Dayton Gear Motor (Model: 1L469)
  - 90 RPM, 50 in-lbs Torque
- Custom Coupling to 11” dune buggy rack and pinion
- Custom Tie Rods
- Linear Potentiometer as Feedback Sensor
- Controlled with receiver using PWM
Brake System

- Comet DC Series Mechanically Actuating Brake Caliper
- 10” Brake Disc
- Custom Mount Designed for Caliper
- Linear Potentiometer as Feedback Sensor
- Powered by Datyon Gear Motor (1L474)
  - 6 RPM, 500 in–lbs
Electronics

- **Speed Controllers**
  - 2 IFI Victor–833: Steering / Braking
  - 4QD–300: Drive Motor

- **Feedback system**
  - Celesco CLP Linear Potentiometer

- **Batteries**
  - Drive Motor: 2 12V 500 CCA Marine Batteries in Series
  - Steering / Braking: 12 V 650 CCA Marine Battery
Remote and Receiver

- Donated By Miratron, Inc.

- Sends PWM to Speed Controllers to control motors

- On board adjustable trim pots to calibrate steering and braking
Seating and Ergonomics

- Two Seat Design
- Passenger’s Seat
  - Custom Seat Frame
  - Briggs and Stratton Go Kart Seat
- Client’s Seat
  - Restored from used wheelchair
  - Custom spring-loaded foot rests with straps
Dashboard and Center Console

- LCD TV Mount equipped with custom housing for placement of remote

- Center Console equipped with fully functional ignition and forward/reverse switch
Safety Features

- Remote Equipped with Kill Switch
  - Kills Power to Drive Motor while applying brakes
- Master Switches Equipped for Power Systems
  - Prevents Battery Drainage
  - Protects Electrical System
- 5 Point Harness on client’s seat
- Seat belts equipped for passenger and client
Budget

- NSF Grant for $3000
- Purchases Made – $3100
- Free Parts Value – $2500
- Total Value – $5600
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Questions?