



NEPTUNE
TECHNOLOGY GROUP INC.

Take Control.

OATS FINAL PRESENTATION

8/1/11

Auburn Student Team:

Kyle Palmer (Project Manager)

Ben Bethel

Grayson Dawson

Cody Owen

Daniel Paulk

Where we are at in the design stage

- Last presentation:
 - Presented four concepts
 - Suggested final concept

- This presentation:
 - Present a detailed final concept
 - a) System
 - b) Assemblies
 - c) Sub-Assemblies
 - d) Components

Overview

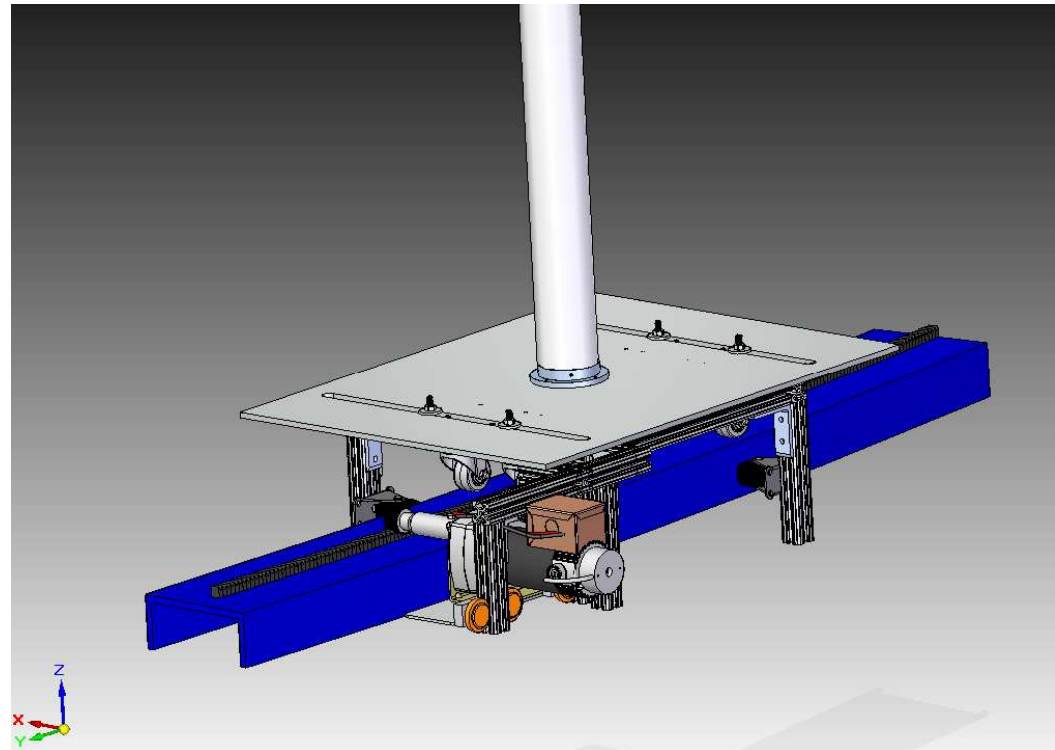
- System View (recap of chosen design)
- Sub-System 1: Power
 - Summary of Design
 - Design Considerations/Key Components
- Sub-System 2: Mechanical Drive
 - Summary of Design
 - Design Considerations/Key Components
- Repeat for Subsystem 3 and 4 (Chassis and Data Acquisition)
- Prototyping Efforts
- BOM
- Next Steps

System View

Battery Powered, Sprocket Driven

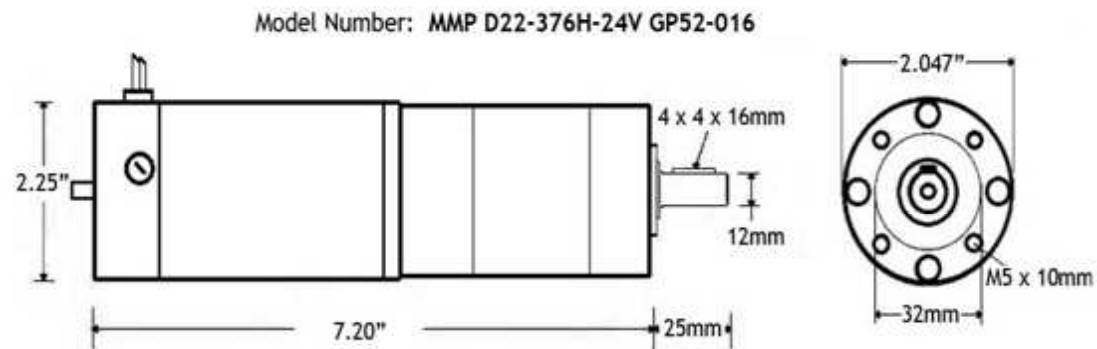
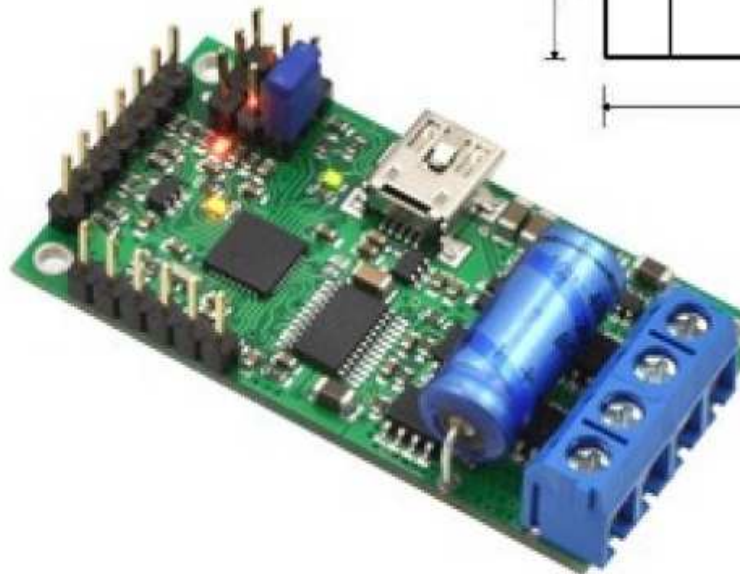
Summary

- Motor on carriage
- Sprocket driven by motor
- Stationary rack around track



Sub-System ONE: Power

- Summary of Design
 - (2) 12V 22Ah Lithium Ion Battery Pack w/ Fuel Gauge
 - 24 V Parallel Shaft Brushed DC Gear motor w/ Encoder
 - Motor Control Board

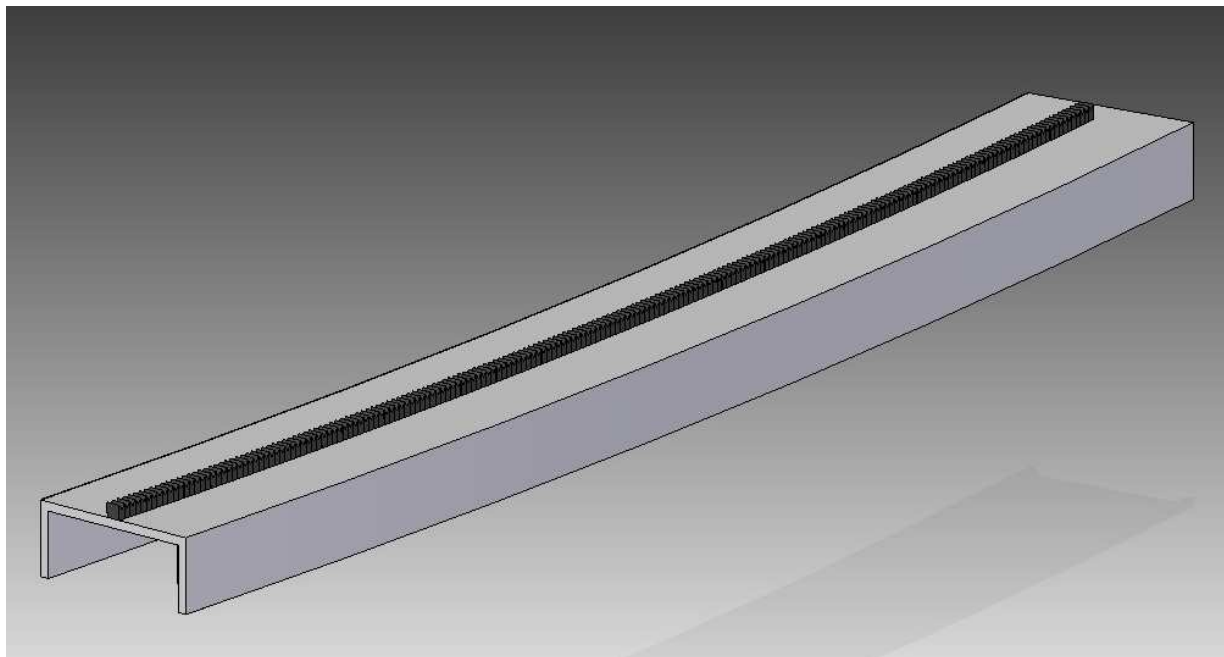


Power Sub-System

- 12V 22Ah Lithium Ion Battery
 - 2 Batteries in Series
 - Lightweight
 - Built in Fuel Gage w/LED lights
- 24 V Parallel Shaft Brushed DC Gearmotor w/Encoder
 - Rated Continuous Current: 1.7 Amperes
 - Gearmotor Rated Continuous Torque: 19 In-Lbs
 - Encoder Reads Up to 1000 Points per Revolution
- Motor Control Board
 - Simple Bidirectional Controller
 - USB, TTL Serial, and Analog Voltage Interface
 - Adjustable Starting Speed, Max Speed, and Braking Speed

Sub-System TWO: Mechanical Drive

- Spur Gear and Shaft
 - 12 Pitch 12 teeth
- Sectioned Bent Gear Rack
 - $\frac{3}{4}$ " width, $\frac{1}{2}$ " depth
 - Gear Rack Welded to Track
 - Modified Studs not shown



Assembly THREE: Chassis

- Summary of Design
 - Carriage (Frame and Rollers)
 - Motor Clutch Assembly
 - Mobile Platform
 - Sectioned Steel Channel
 - Mounting Hardware

Chassis Sub-System



Sub-System FOUR: Data Acquisition

- Summary of Design
 - Receiver
 - Single Board Computer
 - Wi-Fi Unit
 - User Interface (Guard shack)



Data Acquisition Sub-System



Prototyping Efforts

- 13' Section w/ Bend
- Prototype carriage/roller - Designed and Assembled
- 100 lbs push/pull test



Prototyping Efforts Cont.



Test Results to Date:

- 100 lbs weight
- Continuous Speed (Fast & Slow): 7 lbf
- Start-up (Slow): 8 lbf
- Start-up (Fast): 17 lbf

Bill of Materials

Manufacturer	Part Number	Part Description	Price/unit	Quantity	Subtotal
80/20	1010	T-Slotted Profile- Cut to 6.5"	\$1.61	4	\$6.44
80/20	1010	T-Slotted Profile- Cut to 12"	\$2.76	2	\$5.52
80/20	1010	T-Slotted Profile-Cut to 17"*	\$3.60	2	\$7.20
80/20	2523	Double Mesh Panel Retainers	\$5.75	4	\$23.00
Neptune Stock	N/A	1.5" 1/4-20 UNC w/ Washer and Nut	\$0.00	16	\$0.00
80/20	3321	Mounting Hardware for 2523	\$0.50	8	\$4.00
80/20	4176	3 Hole Inside corner Bracket	\$3.85	8	\$30.80
80/20	3393	Mounting Hardware for 4176	\$0.40	24	\$9.60
80/20	4101	4 Hole 2.5" Inside Corner Bracket	\$4.10	4	\$16.40
80/20	3321	Mounting Hardware for 4101	\$0.50	16	\$8.00
McMaster Carr	78155T17	2" Rigid Type Casters (For Alignment)	\$2.00	4	\$8.00
Colson Casters	1.01652.441	1 5/8" Swivel Type Casters (For Load)	\$8.00	4	\$32.00
80/20	1010	T-Slotted Profile- Cut to 5"*	\$1.40	2	\$2.80
80/20	1010	T-Slotted Profile- Cut to 10"*	\$2.50	1	\$2.50
80/20	4176	3 Hole Inside corner Bracket	\$3.85	3	\$11.55
80/20	3393	Mounting Hardware for 4176	\$0.40	3	\$1.20
Custom	N/A	Motor Mount Plate	\$0.00	1	\$0.00
Midwest Motion	MMP D22-376H-24V GP52-016	Brushed DC Gear Motor w/ Encoder*	\$600.00	1	\$600.00
Neptune Stock	N/A	Extension Shaft	\$0.00	1	\$0.00
McMaster Carr	6325K22	Gear- 12-pitch, 3/4" Face Width	\$17.81	1	\$17.81
80/20	2750	Roller Wheel Brackets	\$6.00	2	\$12.00
80/20	2281	Roller Wheels*	\$4.50	4	\$18.00
80/20	2281_10	Permanent Lubricated Bronze Bushings	\$0.00	4	\$0.00
CarrLane	CL-150-TPC-S	SS Threaded Body Toggle Clamp	\$15.55	1	\$15.55
McMaster Carr	3985A42	Double Point Cable Latch w/ T-Handle	\$88.84	1	\$88.84
White Fab	MC 6X12	33' Section of Steel Channel	\$625.15	5	\$3,125.75
McMaster Carr	6295K133	3/4" x 1/2" 12-pitch gear rack	\$66.92	27	\$1,806.84
White Fab	MC 6X12	13' Section of Steel Channel	\$475.00	1	\$475.00
Bear	N/A	Paint-Gallon	\$12.00	2	\$24.00
Rustolium	N/A	Spray on Primer	\$3.97	2	\$7.94
TOTAL:					\$6,360.74

Next Steps

- Continue Prototyping

- Evaluate bent gear rack feasibility

- Purchase:
 - 1) Gear Racks
 - 2) Sample Motor
 - 3) Control Board
 - 4) Spur Gear

Questions or Comments?