Outline

- Introduction
- Current Products Available/ Patents
- Design
- Budget
- Impact on Client’s Life
- Summary
Introduction:
Client Background

- Frankie Kineavy, Sea Girt, NJ
- Cerebral Palsy since birth
  - Athetoid quadriplegia
    - Involuntary movements
    - Problems maintaining posture
    - Trouble in speaking, eating, grasping, other “fine coordination” movements
  - DynaVox® augmentative communication device aids in speaking and conversation
Client’s Current Speaking-Aid System

• DynaVox® DV4
  – Accessible by touchscreen, mouse, joystick, USB port, auditory scanning
  – Headtracker via USB connection
  – 12hrs. Average battery life
  – Integrated speaker
  – Direct select or scroll option
Current Problem

- Scanning head switch is too slow for normal conversation
- Client cannot easily access touchscreen
- Previously used joystick controls not durable enough
- Physical limitations narrow possibilities
- Current set-up does not meet client’s wants or needs
Solution

• Durable Joystick Control
  – Multiple Selection Options
  – High Wear Resistance
  – Universal Usage
  – Weather Resistant
  – Simple Mounting Ability

• Viewing Screen
  – Mounted Opposite DynaVox Screen
Current Products Available

• Penny & Giles Products:
  – Rollerball Light
  – Joystick Light
  – Trackball Plus
  – Joystick Plus
  – HeadWay
• P-Q Controls Company
  – Industrial Quality Joysticks
• Ablenet Specs® Switch
• Eye Motion Sensors
  – Quick Glance Eye-Gaze Tracking System
  – CameraMouse®
  – EagleEyes ®
• Head Motion Sensors
Patents

- **Joystick Controller:**
  - Body, operating shaft, ball-and-socket joint mounting
  - Patent Number 6992602

- **Joystick with enabling sensors**
  - Multi-axis vehicle control device
  - Includes 1 or more sensors on joystick handle
  - Patent Number: 6948398

- **Navigation Apparatus**
  - Includes joystick adapted for 3 motions of leaning
  - Predetermined directions rotated about and pressed along an axial line
  - Patent Number: 6862520

- **Color LCD Panel**
  - Includes a lower substrate, an upper substrate and a liquid crystal
  - Patent Number: 5295008
Project Design Specifications:
System Functionality

• Joystick Functionality
  – 360° of movement (dual axis)
  – Positive spring centering
  – UV Stabilized Coating/ Weather Resistance
  – Power from existing DynaVox
  – Two selection buttons and One Head-switch selection

• Viewing Screen Functionality
  – Connection via VGA Video Card
  – Internal Rechargeable Battery
Joystick Type

- Hall Effect Joystick
  - Converts mechanical displacement to electrical output
  - Electrical Field Variations
  - No Contacting Components
  - 5 Volt, USB Connection
  - Adjustable Mounting
Control Joystick:

- Front View
- Top View

[VIDEO]
Project Design:

Viewing Monitor

- 7 Inch Color Liquid Crystal Display
  - VGA Video Connection
  - Rechargeable 12 Volt NiMh Battery
  - Universal Smart Charger
  - Monitor On/Off/Charge Rocker Switch
  - Monitor-On LED Indication
  - Adjustable Mounting
Viewing Monitor:

Front View

Side View

VIDEO
## Budget

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<th>Part</th>
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Impact on Client’s Life

- Dramatically Improved Communication with Others
- More Rapid Means of Communication
- Face-to-Face Conversations
- Better Grip on Joystick
- Better Posture
Summary

- The main goal of this project was to develop better communication with others.
- With the improved durability of the joystick and the addition of a viewing screen, the client now has more personal and interactive conversations.
Acknowledgements

- Frankie Kineavy, Client
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- P&Q Controls, Inc., Supplied the joystick for the project
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- National Science Foundation Project to Aid the Disabled Project
- National Science Foundation, Supplied the funding for the project
- Dave Mareiro, Team 2
- Serge Doyon and Richard Donazza, Metalworking and Machine Shop Laboratory Professors
References

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Questions?