Objectives

1. Identify the difference between Proportional and Non-Proportional Driver controls and list at least three characteristics of each.
2. Name three clinical indicators for evaluating driver control sites to use when selecting appropriate driver controls.
3. List at least two current technology options for mechanical & electrical switches used for Driver Controls or mode switch and as list appropriate applications and candidates for each.
4. Identify the key programming parameters and corresponding adjustments for optimal power wheelchair control with at least three different driver control input.
5. Discuss the application of Tracking technologies and its impact on power wheelchair performance.

Assigning Modes

How many activities can you place into one Drive Profile???

- Driving
- Power Seating
- Automatic Positioning/ Memory Seating
- Drive Selection 1, 2, 3, 4, etc.
- Environmental Controls
  - TV, VCR, Stereo, Lights, Intercom, Door Opener, Call for Caregiver...
- Computer Access / Internet Access / E-mail
- Augmentative Communication, i.e., SGD’s
- Rim Driving

Before anything else...

Positioning = Access = Function
Switch Functions

1. As a Driver Control
2. To change Forward/Reverse (RIM Driving)
3. To change speeds when using “3 Speed Dig”
4. To Operate Powered Seating (Tilt or Recline)
5. As a Safety “Stop” Switch
6. As a Reset Switch to change modes
7. To Turn the Chair On or Off
8. To wake a chair up after it enters “Stand-By Mode”
9. To Change / Access Drive Profiles (Drive Select)

Switch Site Hierarchy

1. Hand
2. Head
3. Mouth
4. Upper Extremity
5. Lower Extremities
6. Foot
7. ???

Switch Assessment

Location...Location...Location...

Sustained v/s Momentary Activation
Pressure (Mechanical) v/s Movement (Electrical)
Quick Release v/s Relaxed Release
Quick Activation v/s Relaxed Activation

Switch Operation

Three Functions Available:
1. Mode Switch
2. Drive Select Switch
3. Actuator Switch

To program a Single function:
Calibrations Menu ► Mono Port 1

If Two Functions are required, (Two Switches), add “Y” Cable (Splitter)
Calibrations Menu ► Mono Port 1 ► Mono Port 2

Ablenet & ASL

APPLICATION?
**Standby Select**

- Enhanced by added RIM as a mode.
- Eliminates the need for a Drive for driving only (Regular and RIM) and another Drive for Power Seating. Now each drive can have Driving, RIM driving, Power Seating control, ECU control, etc.
- A True Drive-Only control for all operations. Great for Head Control Users.

“May We Take Your Order”

**Accessing Features**

**Through Alternative Driver Controls**

- Wheelchair electronics provide access and control of the chair’s features and accessories — E.g., drive, tilt, recline, communication devices
- Features are accessed through menus via drive control system

**Scan Mode**

- 3 Scanning Options for access
  - Modified Row Column
  - Based from Standard View
  - Enhanced Scanning
  - Based from Enhanced View
  - Sequential Scanning
  - Largest Icons available – One at a time.

**Interface Modules**

- ASL Digital Interface
- MK6i Mouse/IR Module
- Visual Feedback
- Display Readouts w/ icons

**Single Switch Scanner**

**Driver Control**

**Visual Feedback**
**Auditory Feedback**

The Audible Indicator allows the user to determine current mode status without the need for visual perception.

**Infrared/Wireless RF**

Communication is Paramount!

RF and Bluetooth can interface with SGD-(Speech Generating Device)

**Infrared/Wireless RF**

Simplicity is the Key!

- Simple operation for the User!
  - Basic IR Control Functions
  - Supports 4-Quadrant (Joystick) and 3 Quadrant (Head Array)
  - Head Array users can tilt back and still have access to all IR Features

- Simple programming set-up for the Provider
  - No Computer required for set-up / programming
  - Use Remote Programmer, Pro SD Card, virtual software
  - Enable IR devices by entering device codes or learn commands

**Infrared v/s Radio Frequency**

- Infra-red Signals:
  - Line of sight Only
  - Can not penetrate walls / obstacles
  - Can be reflected

- Radio Frequency Signals:
  - wireless communication protocol
  - Distance limited by strength of signal
  - Penetrate walls / obstacles
  - Different protocols (ZigBee / Bluetooth / Simple / etc)

**Computer Access**

Mouse Emulation

The Power Chair gives Independent access to the Environment...

The USB Mouse Gives Independent Access to the Rest of the World...

- Allows the Driver control to act as (emulate) a PC mouse
- Compatible with PC or MAC Computers
- Compatible with Augmentative Communication Devices (AAC)
- Included Standard with the IR Module
- Use with On Screen Keyboard for Access
Mouse Clicks

MK6i:
- Dedicated External switches
- Dedicated Driver Control Commands

Q-Logic:
- Left directional switch = left click, double hit = double click
- Right directional switch = right click
- External switch via additional “Run Plug”

R-net:
- Left and right directional switches, quick hit

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Mouse Emulation: 4-Quadrant Mode

- Proportional Joystick will move the mouse in any direction.
- Mouse Click can be done using:
  - Stereo switch - Left & Right click function
  - Mono Switch – Left click only
  - Dwell “Software” installed on PC (users with no switch access)

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Mouse Emulation: 3-Quadrant Mode

Drivers using RIM (3 quadrant) driving
- Right Command = Cursor movement toggles: Left / Right
- Forward Command = Cursor movement toggles: Up / Down
- Left Command = Mouse click / Double Click / Mouse Latch
- (Mouse Latch = pressing & holding left mouse button)

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Q-Logic

Q-Logic EX Enhanced Display

The optional Enhanced Display serves as a separate screen used with specialty drive controls to display system data. With the Enhanced Display’s built-in environmental controls, Q-Logic can operate a wide range of appliances that use infrared (IR) remote controls, such as televisions, and serves as a Bluetooth computer mouse emulator.

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Dynamic Controls

iPortal Dashboard

iPortal Mouse Mover
Automatically pair with your computer and start writing emails or surfing the web from your power wheelchair using your Dynamic Controls remote joystick or specialty input device.

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ASL

ATOM Electronic Head Array

<table>
<thead>
<tr>
<th>Compact Features Include:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- The electronics are combined within the Atom Electronic Head Array for ease of access to the switch ports.</td>
</tr>
<tr>
<td>- The switch settings and adjustments allow simplicity in how the Atom Electronic Head Array functions.</td>
</tr>
<tr>
<td>- The directional indicator helps a clinician/therapist see when a client is accessing a switch.</td>
</tr>
<tr>
<td>- The adjustable switch timer helps a client use ease of access to all the other wheelchair functions.</td>
</tr>
<tr>
<td>- The important on/off switch is located for easy access right on the back of the Atom Electronic Head Array.</td>
</tr>
<tr>
<td>- The most exciting new feature is that, with a touch of a switch, the Atom Electronic Head Array can be used as a wireless switch interface for computer access or AAC devices.</td>
</tr>
</tbody>
</table>
ASL

ENHANCED FEATURES
- Standard Indoor
- Enhanced Outdoor Weather Protection
- Seat & Headrest (optional)
- Seat & Lumbar (optional)
- Seat & Lumbar & Headrest (optional)
- Footrest (optional)
- Seat & Lumbar & Headrest & Footrest (optional)
- Powered Seat (optional)
- Seat & Lumbar & Headrest & Footrest & Powered Seat (optional)

ATOM Electronic Head Array

Motion Concepts

Electronics Topics
- M200 Electronics Series: Features and Benefits
- M200 Electronics Series: Seal Controllers
- M200 Electronics Series: Components
- M200 Attendant Control
- M200 Programming (Hands On)
- Alternative Driver Control Set-up (Hands On)

Motion Concepts

NEW Electronics
- “Want to program through H&P”
- “Need one set of electronics”
- “Programmable systems are cluttered”
- “Electronics compatibility and programming”

Motion Concepts

M600 Electronics Series: Features and Benefits
The NEW fully modular M600 features up to six actuator outputs while the M260 offers two channel actuator output and the M136 for single channel actuator output. All in a slim, compact package that hides neatly under the seat pan for a clean, uncluttered look. Paired with the M600 Attendant Programmer, the duo provides unmatched programmability, growth and function, all with up to a 40% reduction in harnesses, cabling and complexity.

Motion Concepts

Order Form Electronics Review

- Enhanced Single Function Through Joystick $2350.00
- Enhanced 6 Function Control $791.00
- Enhanced 6 Function Through Joystick $2950.00

New Electronics

Powered Seating

Motion Concepts
M600 Electronics Series: Seat Controllers

Single Function Control Box M136

- The new single function control box controls one seating function through a separate switch (indirect), toggle (direct).
- Less than half the size of Helix 1.0 with all the same power output.
- Utilizes new Molex connector harness for actuator power.
- Incorporated new smaller molded limit switch cables for cleaner installation and mounting.

M136 for use with:
- M80
- M90

M600 Electronics Series: Seat Controllers

M206 Single/Dual Function Seat Controller

- M206 Dual-Function Control Box offers up to 2 actuator outputs.
- Under seat/motion module mounting eliminates cabling on the back of the chair.
- Thoughtful design allows consistent wiring from system to system for easier service and in-field functional changes.
- Built-in actuator output connections eliminate need for bulky external wiring harnesses.
- More compact limit and mechanical switch connectors reduce profile and footprint of box.

M600 Electronics Series: Components

M600 Seat Controller

- Up to 6 actuator outputs ensure you can easily handle even the most complex, multi-function systems.
- Small footprint integrated controller designed to be mounted underneath the seat freeing the back of the chair of multiple cables.
- Utilizes Molex micro fit locking connectors for limit and switch inputs instead of bulky DB9 connectors.
- Thoughtful design allows consistent wiring from system to system for easier service and in-field functional changes.
- Built-in actuator output connections eliminate need for bulky external wiring harnesses.

M600 Electronics Series: M260 Attendant Control

- Compact (1¾" x 3½") box works as an attendant control and programmer for all power positioning functions.
- Hand-held attendant control of all to do power positioning functions in familiar Helix Box configuration.
- Easy to read, backlit, blue LED display.
- Password protected access to all programming for the Power Positioning system. No more opening Helix box and accessing mechanical dip switches.
- Easily set individual actuator speeds in both forward and reverse directions.
- Configure joystick and/or installed mechanical switch in either toggle or direct mode.
- No need for individual hand-held programmer, everything you need to do can be accomplished through M260.
M260 replaces the Sigma interface of existing Helix products to act as an attendant control for the seat functions. The M260 is the size of an 8-way switch and can easily mount on the back of the chair. The M260 can be removed if the user does not want it on the chair and all the configuration settings will be saved in the M600. Through the setup interface in the M260 you can do the following:

- Setup (enable) the installed functions of the system on the chair. This eliminates the need to ever open a box to set dip switches.
- Set the speed of each actuator in both Forward and Reverse directions. (Speed can also be set dynamically while running a function as per the sigma)
- Configure the installer accessory switch to whichever functions are desired in either toggle or direct mode (This eliminates the need for a MACHC)
- Configure the ASM settings as desired by the user. Defaults are available to ensure all functions from the M600 are accessible. When you activate the switch you want and then select the action you want it to perform. The M260 also is used to set the Tipsy on the M600. This means that we only need a sensor plugged into the M600 rather than a Tipsy box for programming along with a controller. This eliminates the need for a Tipsy box for programming along with a controller. Everything is now in the system, no more external programming harnesses.

Brad’s Talking points

- No more boxes, tremendous reduction in complexity
- 50% reduction in wiring and harnessing
- One system-less, M600, very small and attendant control
- Easy access to all plugs, blocks and boxes for modularity and tech service
- All programming through M600, no need for M600
- One-box system for all base electronics = ease of use and familiarity for provider
- No more actuator harnesses, actuators plug directly to the M600
- All connections are “locked” for consistent connections and reduction of “intermittent” connectivity issues
- Almost completely removed wire ties in system
- New gray clips for wire routing and easy servicing
- No more external Tipsy box, integrated programming
- Everything you need is in the system, no more external programming harnesses
- This is a MAJOR, MAJOR improvement and one that makes your provider’s lives much easier....