Computer Access Options for Individuals with ALS

Sara Feldman
Physical Therapist
Assistive Technology Practitioner
Objectives

• Identify common difficulties with computer access encountered by individuals with ALS.

• Become acquainted with computer access options.

• Locate the accessibility options available in a familiar computer’s operating system.
Accessibility Issues

• Difficulty using the standard keyboard

• Difficulty using the standard mouse
  – Cursor
  – Click

• Difficulty with both
Accessibility in Windows XP
Accessibility Wizard

Welcome to the Accessibility Wizard

This wizard helps you configure Windows for your vision, hearing, and mobility needs.

If you are using an input device other than a mouse, instead of clicking, use the appropriate action to complete commands or select items throughout the wizard.

To continue, click Next.
For the keyboard or mouse, choose "I have difficulty using the keyboard or mouse"
Accessibility in Windows
Ease of Access
Ease of Access Center

Make your computer easier to use
Quick access to common tools
You can use the tools in this section to help you get started.
Windows can read and scan this list automatically. Press the SPACEBAR to select the highlighted tool.

Start Magnifier
Start Narrator
Start On-Screen Keyboard
Set up High Contrast

Not sure where to start? Get recommendations to make your computer easier to use

Explore all settings
When you select these settings, they will automatically start each time you log on.

Use the computer without a display
Optimize for blindness

Make the computer easier to see
Optimize visual display

Use the computer without a mouse or keyboard
Set up alternative input devices

Make the mouse easier to use
Adjust settings for the mouse or other pointing devices

Make the keyboard easier to use
Adjust settings for the keyboard

Use text or visual alternatives for sounds
Set up alternatives for sounds

Make it easier to focus on tasks
Adjust settings for reading and typing
Universal Access on Mac

System Preferences

- Personal
  - Appearance
  - Desktop & Screen Saver
  - Dock
  - Exposé & Spaces
  - Language & Text
  - Security
  - Spotlight

- Hardware
  - CDs & DVDs
  - Displays
  - Energy Saver
  - Keyboard
  - Mouse
  - Trackpad
  - Print & Fax
  - Sound

- Internet & Wireless
  - MobileMe
  - Network
  - Bluetooth
  - Sharing

- System
  - Accounts
  - Date & Time
  - Parental Controls
  - Software Update
  - Speech
  - Startup Disk
  - Time Machine
  - Universal Access

- Other
  - Flash Player
  - Flip4Mac
  - Growl

Universal Access

- Seeing
  - Stick keys: On/Off
  - Press the Shift key five times to turn Stick keys on/off
  - Beep when a modifier key is set
  - Display pressed keys on screen

- Hearing
  - For difficulties with initial or repeated keystrokes
  - Slow Keys: On/Off
  - Puts a delay between when a key is pressed and when it is accepted
  - Use click key sounds
  - Acceptance Delay: Long/Short

- Keyboard
  - Key repeat delay can be set or turned off in Keyboard preferences: Set Key Repeat

- Mouse

- Enable access for assistive devices
- Show Universal Access status in the menu bar
Difficulty with standard keyboard

- System options
  - StickyKeys
- External supports
  - Arm supports
  - Orthotics
- Alternate keyboards
StickyKeys

Accessibility Wizard

StickyKeys
You do not have to hold down two keys at once.

If you find it difficult to hold down several keys at once, you may have trouble with key combinations (such as CTRL+ALT+DELETE). Instead of pressing and holding several keys at once, you can press each key one at a time. This applies to key combinations that use SHIFT, CTRL, or ALT.

Do you want to press keys in key combinations one at a time?

[ ] Yes
[ ] No

Accessibility Wizard

Completing the Accessibility Wizard

You have successfully completed the Accessibility wizard.
You made the following changes:

StickyKeys

For more information about using Windows for users with disabilities:
Look up accessibility in Windows Help.
See the Microsoft Accessibility and Disabilities Web page at Microsoft Web site.
To close the wizard, click Finish.
Keyboard help in Windows

Make the keyboard easier to use
When you select these settings, they will automatically start each time you log on.

Control the mouse with the keyboard:
- Turn on Mouse Keys
  Use the numeric keypad to move the mouse around the screen.
- Set up Mouse Keys

Make it easier to type:
- Turn on Sticky Keys
  Press keyboard shortcuts (such as CTRL+ALT+DEL) one key at a time.
- Set up Sticky Keys
- Turn on Toggle Keys
  Hear a tone when you press CAPS LOCK, NUM LOCK, or SCROLL LOCK.
  - Turn on Toggle Keys by holding down the NUM LOCK key for 5 seconds
- Turn on Filter Keys
  Ignore or slow down brief or repeated keystrokes and adjust keyboard repeat rates.
  - Set up Filter Keys

Make it easier to use keyboard shortcuts:
- Underline keyboard shortcuts and access keys

See also:
- Add a Dvorak keyboard and change other keyboard input settings
- Keyboard settings
- Learn about additional assistive technologies online

Save Cancel Apply
Arm Supports

• Access to the keyboard can be assisted by supporting the forearm

www.backdesigns.com/ErgoRest-Mobile-Arm-Support ($90.00)
Upper Extremity Orthotics

- Access to the keyboard can be assisted by supporting the wrist and hand

  - Universal cuff ($12.00)
  - Dorsal wrist support ($33.00 - $45.00)

North Coast Medical
www.ncmedical.com
Alternate Virtual Keyboards

- On-Screen as part of Windows
- Keyboard Viewer on Mac
- Downloads
  - Click N Type
  - Free Virtual Keyboard
- Dasher
On-Screen Keyboard

Microsoft

Windows XP

Windows 7
On-screen Keyboard

Mac

Input Sources → Keyboard viewer
On-screen Keyboards
Downloads

Click-N-Type
cnt.lakefolks.com

Free Virtual Keyboard
Freevirtualkeyboard.com
Dasher

www.inference.phy.cam.ac.uk/dasher/
Difficulty with the mouse cursor

• System changes
  – Change cursor settings

• External options
  – Alternate mouse
    • Remote
    • Track ball
    • Joystick
    • Touch pad
  – Head mouse
  – Mouse through wheelchair joystick

• Virtual
Mouse cursor options

Windows
Alternate mouse options

- Remote or wireless ($25.00-$50.00)
- Trackball ($20.00-$50.00)
- Joystick ($50.00-$70.00)
- Touch pad ($80.00)

www.logitech.com
Head Mouse (Commercial)

- The cursor is moved through head movement.
- A reflective dot is placed on the forehead, which is detected by the sensor.

Tracker Pro  Madentec.com  ($995.00)

SmartNav  NaturalPoint.com ($499.00)
Head Mouse Downloads

• Uses a webcam to detect head movement
• Not as sensitive as commercial products, but improves with use of reflective dot

• Camera Mouse
  – www.cameramouse.org
  – For Windows
  – Free
PWC Mouse

• Uses PWC joystick to control mouse
  – Advantages
    • Generally in PWC when using computer
    • Easy access
  – Disadvantages
    • Requires high end electronics
    • Adds another mode to wheelchair controls
    • Needs to be set-up by vendor
    • Does not always work
PWC Mouse
Smart Phone Access

- Uses mobile phone as mouse
- Apps
  - HippoRemote
    - Lite is Free
    - Pro is $4.99
  - Mobile Mouse
  - Remote Mouse
  - Touch Mouse
Virtual

• Scanning programs
  – A virtual line scans across the screen on one axis then the next.
  – The individual hits the switch when choice is highlighted
  – ScanBuddy ($131.00)
  – DiscoverPro 2.3 ($398.00 +IntelliSwitch)
  – SwitchXS for Mac ($299.00)
Difficulty with the mouse click

• System options
  – Mouse
    • Switch left and right click
    • Change mouse position

• External options
  – Alternate mouse
  – Keyboard mouse keys
  – Switch

• Virtual/hover
  – Dwell
Mouse options

- **Button configuration**
  - Switch primary and secondary buttons
  - Select this check box to make the button on the right the one you use for primary functions such as selecting and dragging.

- **Double-click speed**
  - Double-click the folder to test your setting. If the folder does not open or close, try using a slower setting.
  - Speed: Slow — Fast

- **ClickLock**
  - Turn on ClickLock
  - Enables you to highlight or drag without holding down the mouse button. To set, briefly press the mouse button. To release, click the mouse button again.

**Mouse Properties**

- **Buttons**
- **Pointers**
- **Pointer Options**
- **Wheel**
- **Hardware**

**Buttons**

- **Switch primary and secondary buttons**
  - Select this check box to make the button on the right the one you use for primary functions such as selecting and dragging.

**Double-click speed**

- **Double-click the folder to test your setting. If the folder does not open or close, try using a slower setting.**
  - Speed: Slow — Fast

**ClickLock**

- **Turn on ClickLock**
  - Enables you to highlight or drag without holding down the mouse button. To set, briefly press the mouse button. To release, click the mouse button again.
Mouse Keys

Make the mouse easier to use
When you select these settings, they will automatically start each time you log on.

Mouse pointers
Change the color and size of mouse pointers.

- Regular White
- Large White
- Extra Large White
- Regular Black
- Large Black
- Extra Large Black
- Regular Inverting
- Large Inverting
- Extra Large Inverting

Control the mouse with the keyboard
- Turn on Mouse Keys
  - Use the numeric keypad to move the mouse around the screen.
  - Set up Mouse Keys

Make it easier to switch between windows
- Activate a window by hovering over it with the mouse

See also
Mouse settings
Learn about additional assistive technologies online

Save  Cancel  Apply
Switches

Cap ($69.00)  Micro Light ($77.00)  Pillow ($115.00)

Mercury Tilt ($55.00)  Scatir ($590.00)

ablenetinc.com
Interface between switches and computer

- Attaches to the computer with the USB connector. Then the switch is plugged into the opposite side of the base.

Swifty ($80.00)
www.orin.com/access/swifty

Switch Click ($139.00)
ablenetinc.com
How the switch is used

• Direct selection
  – Move the mouse by alternate means then hit switch when cursor is on target

• Scanning mode
  – Program scans across choices then hit switch when choice is highlighted
    • ScanBuddy ($131.00)
    • DiscoverPro 2.3 ($398.00 +IntelliSwitch)
    • SwitchXS for Mac ($299.00)
No click options

- Dwell
- Hover

Dwell Click App on Mac

Hover feature in Windows

Point N Click
Voice Activation/
Speech Recognition

• Uses vocal commands to control the computer

• Most common
  – Dragon Naturally Speaking ($100.00-$180.00)
  – Voice Activated Commands in Windows/Mac

• Advantages
  – Relatively inexpensive
  – Fairly easy to use

• Disadvantages
  – Loss or change in speech
  – Microphones
Dragon Naturally Speaking

Start Menu

Mouse Grid

www.nuance.com/dragon
Speech Recognition

Windows

Configure your Speech Recognition experience

- Start Speech Recognition
- Set up microphone
- Train Speech Tutorial
- Train your computer to better understand you
- Read text to your computer to improve your computer's ability to understand your voice.
- Open the Speech Reference Card

If you would like to learn more about speech related tools and support from Microsoft, please visit the Microsoft Speech Online Community.

See also
- Ease of Access
- Audio Devices
Speech Recognition
Mac
Eye tracking

- In eye tracking systems, the sensor is attached to the monitor and it reads the eye movement.
- Click is provided by an eye blink or a dwell.

Dynavox
MyTobii
LCTechnologies ~$17,000.00
Eye tracking

• Eye Tech eye tracker attaches to your own computer
• www.eyetechaaac.com
• $7000.00
iPad Access

• Virtual keyboard
  – Adapt stylus
  – Gloves

• Voice activated features
  – Still need to be able to press on/off

• Blue tooth scanning available
  – Actual App needs to be enabled, can not scan Home Screen or across apps
iPad Access

Home screen

Gloves
iPad Access

Stylus

Blue2 Bluetooth switch
www.ablenet.inc
($149.00)
Putting it together

• Difficulty with the keyboard
  – Start with StickyKeys.
  – Then the On-Screen keyboard

• Difficulty with the standard mouse
  – Try a different style mouse, maybe a head mouse.
  – Click with switch or dwell.

• Both are too difficult
  – Is voice activated an option?
  – Is eyegaze an option
Example Mr. S

• Issues
  – Fatigues with typing on keyboard
  – Trouble with left click
  – Hand function is Fair
  – Voice is Good
  – Uses PWC

• Options
  – On Screen keyboard
  – Reversed mouse buttons to click
  – Writes out emails by voice recognition
  – Was considering using power wheelchair joystick
Example Mr. B

• Issues
  – Good head control but otherwise quadriplegic
  – Good voice but uses NIV

• Options
  – Uses head mouse with Point N Click
  – On-screen keyboard
Example Mr. C

- Progression
  - On-screen keyboard and standard mouse
  - Changed mouse to joystick
  - Then head mouse and micro switch
  - Finally, eye gaze
  - Research with Brain Computer Interface
Multi-disciplinary Team

Occupational Therapy

Speech Therapy

Physical Therapy
Acknowledgments

• Thanks to the individuals with ALS/MND who constantly challenge me to keep up with the technology

• Dr. Terry Heiman-Patterson

• Rehab team
  – Mark Goren OT
  – Donna Harris SLP
  – Lauren Scull Biomedical Engineer/Research Associate

• Christopher Reeve Foundation

• Kevin O’Donnell Independent Living Initiative
Questions?

Sara Feldman
sfeldman@drexelmed.edu