Tech Connections

Assistive Technology Quick Reference Guide

Mouse Alternatives

Computer Access Series

A computer mouse can be difficult for a person with a disability to use. The user needs to be able to grasp the mouse, move it around in a controlled fashion on a table, and often hold down a button while making these movements. The user also needs to be able see a mouse cursor on the screen and translate those arm movements into cursor placement.

Mouse alternatives are devices that may let a person move the computer cursor more easily with his or her hand, or by not using hands at all. They include trackballs, joysticks, touchscreens, headpointers, and touchpads. Microsoft and Apple both have utilities that set the number pad up so that it can control cursor movements. Some voice input systems can also be used to control the cursor. The products described in this article are only a few of the many mouse alternatives available on the market today. The companies listed may also make or distribute other products, and the included resources also list additional products.

FREQUENTLY ASKED QUESTIONS:

What general types of mouse alternatives exist and who might use them?

- *Trackballs* - A trackball works like an upside-down mouse. Instead of rolling the ball on the table by sliding the mouse around, the ball is moved directly by the user. The trackball does not need to be grabbed; only the ball must be nudged. Most people move the ball with their hands, but it can also be operated with a chin, elbow, foot, or stick held in the mouth. Trackballs come in many sizes, including ones that can be operated by a single finger. For people with limited fine motor ability, a trackball with a larger ball may be useful. Since the trackball remains in a stationary position on the desk or mounted on a stand, it can be a good option for a person with a limited range of motion. They are available at standard computer stores for $50-100.

- *Joystick* - A computer joystick operates a bit differently than a wheelchair joystick. Wheelchair joysticks usually operate as a set of switches, so how far or how fast you go does not depend on how far you push the joystick. For computers, how far a joystick is pushed does matter. For this reason, a person with spasticity who is able to use the all-or-none approach with a wheelchair joystick may have trouble with the more precise control required to use a computer joystick. Still, a joystick may be easier to grab than a mouse, it requires a smaller range of motion than a mouse, and it can also be operated by chin or mouth movements (*Jouse*). Joysticks range in price from $200-2200, depending on features.

- *TouchWindows / Touch Screens* - Touch screens let a person point to parts of a monitor and make

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selections based on where he/she touches. Since the person points directly to what he wants, rather than moving a ball to move a cursor to point to what he wants, it is cognitively easier to use. However, the user also needs to be able to reach up to the monitor. *Edmark's TouchWindow* is a device that fits over a monitor to add this capability (about $350). Monitors with this feature built in cost about $800-1700.

- *Digitizing tablet / touch pads* - To operate a touch pad, a person moves his/her finger, or a stylus, around on a flat tablet. The cursor moves in a corresponding pattern on the screen. This can be a good solution for a person who is not able to grasp a device. Most touch pads require only a small range of motion, and some are as small as a 2 x 2 inch square. They cost $40-70.

- *Head pointers* - There are several types of head pointers. One of the original types consists of a helmet to which is attached a long rod. Keys are hit on a keyboard with this rod, but this may not be a comfortable method of data entry and can transfer stress to the neck. Newer head pointers are electronic and move the cursor in response to head movements. They require the person to wear an infrared (*Headmaster*) or micro-gyroscope (*Tracer*) sensor on his head or perhaps a reflective dot (*Tracker, HeadMouse*). The system measures signals from the sensors, or looks at the way light reflects off the dot, to determine whether the user is moving his head up or down, right or left. The cursor is moved in the same direction as the user's head movements. The result is a cursor control method that is completely hands free. Mouse clicks can be performed by activating a separate switch or by holding the mouse position for a certain length of time (dwell mode). However, the user needs to have good head control, some setup assistance may be needed to put on the reflective dot or sensor, and these systems can be expensive (about $1000).

- *MouseKeys* - MouseKeys is a feature that is built into both Windows and the Macintosh operating system (therefore, most computer owners already have it) to allow a person to move the cursor with the number pad keys. For example, "8" moves the cursor up, "1" moves the cursor to the lower left, etc. MouseKeys provides a nice cursor control option for people who type with a mouthstick or typing splint. It is slow, but it offers good accuracy for times when a person needs to aim the cursor at a small target.

- *Eye Gaze and Eye Tracking* - A mounted camera-like device translates eye movements and eye stares ("dwelling")into directing the on-screen mouse. "Mouse clicks" are done with a slow eye blink, an eye dwell, or a hardware switch. These systems are not suitable for people with uncontrollable eye movement (nystagmus), and potential users must be evaluated and approved in order to purchase the device. They can cost about $10,000.

I can use a mouse, but it just isn't comfortable. Do you have any suggestions?

For problems with carpal tunnel syndrome, a wrist rest designed to be used with a mouse may be tried. Sometimes, switching hands can help. Mouse sizes vary between brands and models, and a too small or too large mouse can be stressful to use over time. Some mice are curved for a better ergonomic fit. This may be more comfortable, or could make the situation worse. For example, people who are left-handed should not use right-handed mice!

Can I use my mouse alternative to help with keyboarding?

Some people find that they have trouble using a standard keyboard, but are easily able to use a mouse alternative. In these cases, an on-screen keyboard might be tried in place of the standard keyboard. A picture of a keyboard is shown on the computer screen, and by pointing to a letter and clicking, the letter is typed. The keyboard that is shown may have a standard QWERTY layout, or it might have a different letter arrangement, show words rather than letters, or be customized for an application. Commercial on-screen keyboards usually cost about $400.

Is there a mouse that I can operate with my foot?

The *NoHands Mouse from Hunter Digital* has two foot pedals: one pedal controls cursor movement, the other is for mouse clicks. The standard desktop mouse remains connected and can be used at the same time. Another option is an extra large trackball (i.e., *Microsoft Easyball* or *Kensington Expert Mouse*) combined with foot pedals (i.e., *Step-On-It!*) for the mouse buttons. The *Step-On-It!* keyboard control pedals can be custom-programmed by the user to assign or reassign any three keys or mouse clicks to floor operation. These products range from $100-290.

Is there a headpointer, I can use without wearing anything on my head?

CameraMouse uses a camera to capture images of the user's head or face and tracks head movements by measuring changes in that image. It can also track finger or toe movement.

Can I use more than one device?

PI Engineering's Y-Mouse allows a person to connect two pointing devices to a PC at one time, with both remaining active. This allow a users to operate a pointing device until they tire, then swap to the alternate device. It also allows one workstation to be shared by two people who need different mouse control devices. It costs about $50.

Is there a way to make the cursor easier to see?

A normal cursor averages 16x16 pixels. *RJ Cooper's Biggy* software changes the cursor size to 32x32 pixels and even 32x64 pixels. Different colors and shapes are used to further enhance visibility. This software costs about $100.

I use a Unix computer system. Are there any devices that I could use?

ITAC Systems and *Microspeed* both make trackballs for Sun workstations. *Sun Microsystems* also makes a keyboard interface box so that PC equipment can be connected.

What is a "haptic" mouse?

Haptic mice are a new invention that provides feedback to the user. The mouse or stylus is mounted on an arm that provides resistance or vibrates as the cursor is moved over various lines on the screen. Although there is not yet much software that works with these devices, they may someday be useful for people with visual impairments because of their potential to let the user "feel" what is on the computer screen.

OTHER INFORMATION RESOURCES:

The Mouse List - http://www.setbc.org/mouselist/mousetop.html

Typing Injury FAQ: Pointing Devices - http://www.tifaq.com/mice.html

PRODUCT LINKS:

Bilbo Innovations	Sunnyvale, CA Phone: 408-736-6086	http://www.bilbo.com	Step On It! foot pedals
Boost Technology	San Francisco, CA Phone: 415-334-8246	http://www.boosttechnology.com	Tracer head pointer
CameraMouse, Inc.	Dallas, TX Phone: 972-231-1180	http://www.cameramouse.com	CameraMouse motion tracker
Cirque	Salt Lake City, UT 800-454-3375; 801-467-1100	http://www.glidepoint.com	touchpads
Don Johnston	Volo, IL Phone: 800-999-4660	http://www.donjohnston.com	Penny & Giles joysticks, trackballs
Edmark	Redmond, WA Phone: 800-691-2986	www.edmark.com/specialneeds	Touch Window
EyeTech Digital Systems	Phoenix, AZ Phone: 480-610-1899	http://www.eyetechds.com	Quick Glance Eye-tracking
HACH	Winston-Salem, NC 800-624-7968; 336-744-7280	http://www.hatchstuff.com/products/assistive.html	trackballs for children
Hunter Digital	Los Angeles, CA Phone: 800-57-MOUSE; 310-476-1874	http://www.footmouse.com	No-Hands Mouse
Infogrip, Inc.	Ventura, CA 800-397-0921; 805-652-0770	http://www.infogrip.com	resellers
Keyboard Alternatives & Vision Solutions	Santa Rosa, CA 800-953-9262; 707-544-8000	http://www.keyalt.com	resellers
Kensington Microware	800-268-3447	http://www.kensington.com/products/pro_c1018.html	trackballs
Madenta	Alberta, Canada 877-623-3682; 780-450-8926	http://www.madentec.com/products/products.html	Tracker head pointer
Origin Instruments	Grand Prairie, TX Phone: 972-606-8740	http://www.orin.com	HeadMouse head pointer
P.I. Engineering, Inc.	Williamston, MI 800-628-3185; 517-655-5523	http://www.ymouse.com	Y-mouse
Prentke Romich Co.	Wooster, OH Phone: 800-262-1984	http://www.prentrom.com	HeadMaster, Jouse joystick
RJ Cooper & Assoc.	Laguna Niguel, CA 800-752-6673; 949-582-2749	http://rjcooper.com/site-map/	switch adapted devices, Biggy