"Getting round" – Difficulties with the Keyboard and Mouse

Generally when you purchase a computer it comes with a standard mouse and keyboard. For many people these devices pose difficulties. This factsheet is written to outline some of the options that are available. We cannot comment on every single piece of equipment. If you would like further information please do not hesitate to call us.

Keyboards

The standard PC keyboard is designed to be used with two hands, it favours right handed people (the numeric keypad is on the right), and can be "over sensitive" so that it is easy to get a string of letters if a key is held down for slightly too long.

Modifying the keyboard response

Fortunately there are a number of software programs which can be used to modify the way the keyboard behaves. These are free and can be used alongside standard keyboards. Some of the main functions are:

Sticky keys: this allows one finger users to operate shift, control and alt keys. The modifier key is held down until the next key is pressed. So to type "The" the keystrokes would be: shift t h e .

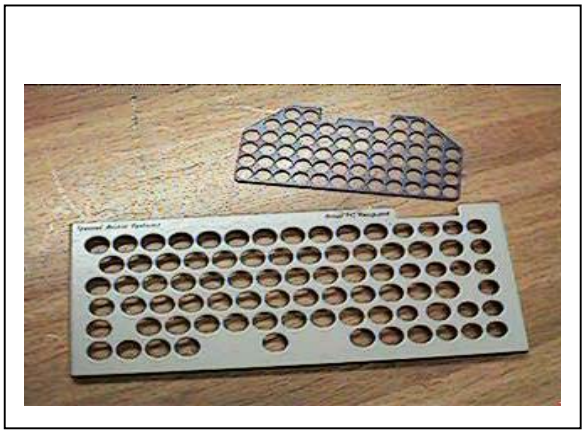
Key repeat rate: this defines the length of time a key needs to be held down before it repeats on the screen.

Mouse keys: to allow the mouse pointer to be moved around using the numeric keypad keys.

DOS:	Access Pack	AbilityNet
Windows 3.11:	Access Pack for Windows	AbilityNet
Apple Mac:	EasyAccess	Supplied on the system disks, needs to be installed
Windows 95/98/ME/NT	Accessibility Options	Already built in, look in Control Panel/Accessibility

AbilityNet is a registered charity, No. 1067673. Telephone 0800 269 545 – Email: enquiries@abilitynet.org.uk – Web: www.AbilityNet.org.uk

Keyguards



These are rigid plates with holes designed to work with specific keyboards. The holes are positioned over each key and they make it impossible to press two keys at once. As a further benefit it is possible to rest hands and arms on the guard without pressing keys. They can be removed and fitted for use only when required.

It can often be easier to purchase a keyboard and guard together rather than get one to fit a specific keyboard.

Keyboard/guard combinations, standard and small computers	Maxess Products Inclusive Technology
Customised keyguards	Dave Williams Design Engineering

Different sizes and shapes

There is a wide choice of keyboards to replace the standard keyboard. We have chosen examples of keyboards here to illustrate the ideas described. Picture sheets are available to give more comprehensive information on the choices available.

Small keyboards

Small keyboards can be more easily positioned and are often suited to single handed users. They can fit between the arms of a standard wheelchair.

The actual key sizes are fairly similar to a standard keyboard. Space is generally saved by removing the numeric keys and reducing the gaps around the editing and function keys.

If the numberpad is essential, then it is possible to buy numberpads which can be positioned to the left or right as needed.

Space saver keyboards 40% desktop area	Datalux
Cherry G84, and separate numeric pads	Inclusive Technology, Granada Learning
PC-Mini (small membrane keyboard, design is similar to PC King pictured below)	Cambridge Adaptive, QED
a number of designs including infra-red	Intolect Ltd

Large and expanded keyboards

PC King

Intellikeys and overlays

Expanded keyboards can help in situations where it is difficult to accurately locate a normal sized keytop. The larger size gives more area to "aim at".

Many expanded keyboards have a "built in guard" as the letters are slightly sunk beneath the surface of the keyboard.

"Intellikeys" is a flat keyboard which is pressure sensitive. It comes with a number of "overlays" which define the action of areas on the surface of the board. You can change layouts "on the fly". In addition you can design your own layouts. This can be useful if you only want to work with a small number of keys.

Concept keyboards are also flat and pressure sensitive. These come in A4 and A3 sizes and have a number of predefined "cells" on their surface. Using a software package it is possible to assign certain keystrokes/sounds/actions to particular areas on the concept keyboard. After defining the areas on the keyboard, a paper overlay can be printed or drawn to show the active areas.

PC King	Cambridge Adaptive, QED
Concept Keyboard	Traxsys, Granada Learning Ltd. – SEMERC, Inclusive Technology
Intellikeys	ECS, Inclusive Technology
BigKeys	Keytools

Ergonomic

Ergonomic keyboards are aimed at those wanting to touch type using both hands. Generally they incorporate a split between keys operated by each hand with the aim of reducing strain in wrists and arms.

A number of variations on this design are available.

Many ergonomic keyboards have a fixed split. However some ergonomic keyboards, like the one pictured above, are hinged to allow the angle and height to be adjusted.

In addition to the two handed design PCD Maltron supply an ergonomic keyboard aimed at single handed users wishing to use all fingers to touch type.

(Microsoft Natural keyboard).	General PC suppliers, mail order eg Misco
Seimans Nixdorf ergo keyboard	Tracline UK, NE Computing
Maltron Ergonomic Keyboards	PCD Maltron, ECS

Numeric keypad use

Because the standard keyboard has a fixed numberpad it presents difficulties for some left and right handed users. A left handed user wishing to use the numberpad will have to reach across their body. A right handed user who makes little use of the numeric pad has to reach unnecessarily in order to use their mouse (or pointing device). Separate numeric pads used with shorter keyboards provide a more flexible solution.

Cherry numeric pads (small and large – work alongside other keyboards)	Inclusive Technology, Access Keyboards
Electrone Minkb and Minikb numpad	Intolect Ltd

Headpointer and mouthStick

Some of the smaller keyboards mentioned earlier may be suitable for use with headpointer and mouth stick. In addition a more specialised layout is available from PCD Maltron.

Headpointer, Mouthstick	Aremco
Headpointer keyboard	PCD Maltron

Other specialised keyboards

Chord keyboards have only a few keys and rely on keys being pressed in combination to generate letters. They therefore work well for single handed users with independent movement in each of their fingers.

The keyboard pictured here is for left hand use. Right handed versions are available! CYKey is a similar chording keyboard which uses the same code as a microwriter.

BAT Chord Keyboard	AbilityNet
CyKey	Bellaire Electronics, Keytools

Position

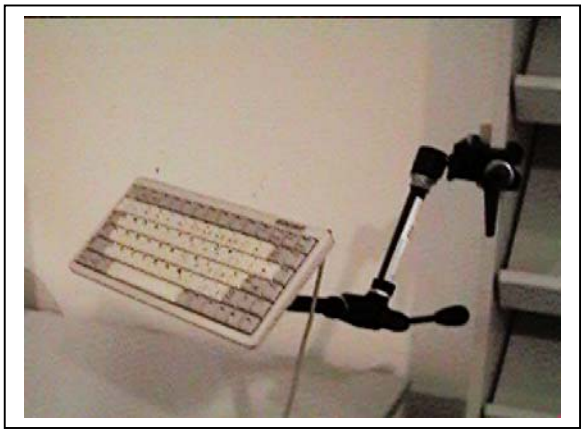
It is very important when using keyboards and pointing devices to be comfortable. Some of the following ideas may be helpful:

Keyboard tray

This bolts under the desk and provides a retractable tray which holds the keyboard. It allows a lower typing position which may be more comfortable. A “lap tray” can achieve the same effect. It is basically a small bean bag attached to a tray, the beans mould to the shape of your legs and the tray gives a flat surface. A Laptap is similar but without the tray and is intended for use with laptops.

Keyboard Tray	Datasound, Advance Seating Designs
Lap Tray	QED, Homecraft Abilityone
Laptap	Laptap Ltd

Fixing equipment



Keyboards, switches and pointers can be fixed in specific locations using modular systems like the one illustrated. Home made devices can also be helpful e.g. to raise up or tilt a keyboard.

Mighty Mount, Universal Mount	QED

Arm and wrist supports

Foam pads placed in front of the keyboard can be helpful when resting from typing. These are widely available from most office suppliers and PC outlets. Where there are difficulties supporting the weight of arms, articulating wrist supports which clamp to the table top are useful.

Articulating arm supports	Posturite, Datasound
Foam supports	Many office suppliers, Datasound, Misco,

Monitor arms

These allow monitors to be easily moved and positioned. Generally they are designed for standard monitor sizes, heavy duty arms are also available.

Monitor arms	standard office suppliers, also from Datasound, Posturite, SIS Jensen

Workstation redesign

Many people (especially those with neck and upper back problems) find that a slightly reclined working position is more comfortable.

Togl Organiser from Osmond Group Ltd

Keytops

These are sticky labels which can be placed over the standard key tops. Large print high contrast labels are helpful for visually impaired users and lowercase tops can make keyboarding easier for children and those with writing difficulties.
Keytops are also available for other languages, for example, Arabic.

Lower case stickers	Granada Learning Ltd/SEMERC
Large print stickers	Dolphin, Technovision, Pulsedata
Other language stickers	Omega First Ltd.

Protection

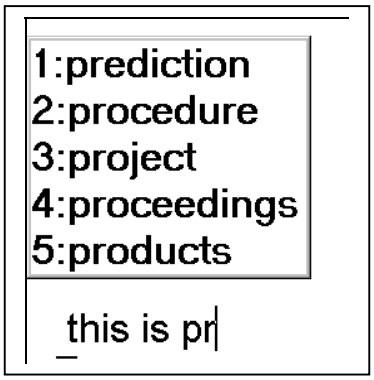
Anti-dirt, anti-moisture keyboard covers can be used to protect the keyboard.

Inmac, Misco, Inpace

Speeding up keyboarding

The following techniques can increase keyboarding speed:

Prediction



After typing the first few letters of a word predictive software gives a number of words starting with those letters. To complete the word the user simply selects one of the words offered. For longer words this can offer speed improvements.

Prophet (Windows)	Ace
Co-Writer (Windows, Mac)	Don Johnston
KeyRep (Windows)	Liberator
TextHelp (Windows)	TextHelp Systems Ltd
FinishLine (shareware, DOS and Windows 3.11)	Many shareware sources, on disk from AbilityNet
Mindreader (shareware DOS)	AbilityNet
Penfriend (Windows)	Inclusive Technologies

Storing and retrieving text

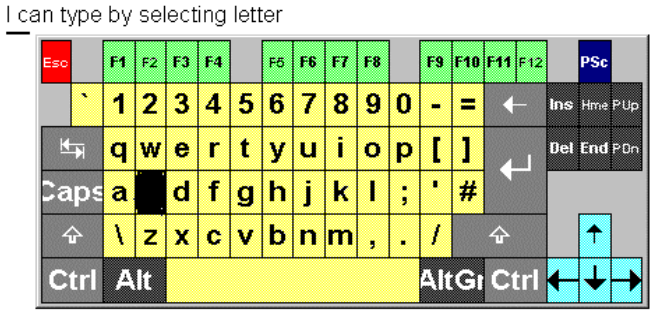
In situations where there are no built in macro facilities, there are a number of add-on packages giving the same facilities: e.g.:

Abbrev	Ace Centre
TextHelp	TextHelp Systems Ltd, Iansyst, Inclusive Technology

Typing without a keyboard

It is not necessary to be able to use a keyboard to get ideas and text into a computer.

Keyboard Emulation



Here letters are selected from an on screen keyboard. A mouse or trackball can be used to make the selection.

This same idea can also work with switches, where the user needs to select first the line then the column. Even if someone can only use a single switch they can operate a computer!

Figure 2: Wivik on-screen keyboard

Wivik	Liberator
EZKeys	Cambridge Adaptive
HandsOff!	Sensory Software
Discover Switch, Discover Screen	Don Johnston
SAW	Ace
Penfriend	Inclusive Technology

Voice recognition

This is a realistic option for those who have good speaking voices. The systems take time to “train” to recognise the speaker, but with practice it is possible to work at the speed of a good typist. More recently these systems have become much more affordable - a full list of options is described in our factsheet “Voice Recognition Systems”

Pointing devices

Standard computer mice come in all shapes and sizes, but are similar in needing to be rolled around a portion of desk. They need to be held in one position while the button is pressed. As a result they pose many problems for people with disabilities.

Making use of the keyboard

In Windows the keyboard can be used to perform most of the functions of a mouse. For example menus can be activated and text selected by simple keystrokes like alt-f and shift-right arrow. For further details please request our factsheet “Keyboard shortcuts in Windows”.

Adjusting the way the mouse behaves

Just as it is possible to modify the keyboard response it is also possible to change the way the mouse behaves. In Windows "Control Panel" there is a mouse icon. Here you will be able to change the speed of the mouse; adjust the amount of time needed for "double clicking"; and swap the buttons over for left handed use. Depending on the type of mouse you have you may also have other things you can experiment with e.g.:

- Changing the acceleration of the mouse
- Forcing it to only move horizontally and vertically
- Putting different functions onto the available buttons.

Drag lock

Many programs require you to "drag and drop" pictures or text from one place to another. When doing this you need to move over the item, press and hold the mouse button down, move to the new location and release the button. We often find that this is difficult for people with disabilities. A useful feature to get around this problem is "drag lock". Here you simply move over the item, click (i.e. press and release a button), move to the new location, and click the same button again to release the item.

The drag lock feature is available on many pointing devices. It can be an additional button on the device which always works as a drag lock, or it can be a button which you can set-up to be a drag-lock using the control panel settings.

Different kinds of mouse

It is often worth trying a few different mice as they have different sizes and shapes; and require varying amounts of pressure on buttons. We have not illustrated every possible device here (more are shown on separate picture sheets) .


Contour and Microsoft Mice

Microsoft Mouse	Many PC, office and mail order suppliers
Logitech Mice	" "
Kensington Mice	" "
Contour mice	Contour Design (Europe) Ltd, Posturite
Anir Mouse	Osmond

Trackballs

A trackball is basically an upturned mouse. Rather than rolling the mouse on the table top it is a static device and the ball on the top is moved using fingers, thumbs and palms. Larger trackballs are often suitable for use by feet.



PC-Track, Logitech Trackman Marble, Kensington Expert Mouse

PC Track, Micro Track	Intolect Ltd, Computerware, Keytools
Mouse Track, Mouse Systems II	Business Futures Ltd
Kensington trackballs	Misco
Logitech, Microsoft	Many PC, Office and mail order suppliers
Semerc Roller	Granada Learning Ltd/SEMERC, Traxsys, Inclusive Technologies

Joysticks

Semerc Joystick Plus

These type of devices work in a similar manner to joystick controls on a wheelchair. The mouse pointer moves fastest when the joystick is pushed fully forward. The joystick illustrated has a built in guard and has a drag lock button and a button which sends a double click.

Available from: Granada Learning Ltd/SEMERC, Traxsys, Inclusive Technology

Touch pads

Touchpads

These devices are often found on laptops. They are stationary pads which are operated by sliding your finger across the surface. Clicking can be done with buttons or by "tapping" lightly on surface. They can be held in the hand or placed on a desk.

Cirque Touch Pads	Touchstone Resources Ltd

Pen devices

These are held in the hand like a pen and come in two basic forms:

- a device that acts in a similar manner to a mouse, you move it and a small ball rotates moving your pointer in that direction (relative movement)
- a device which you move on a tablet, the tablet represents the screen area, if you touch the centre of the tablet you will always be in the centre of the screen. These tend to be called graphics tablets. They are widely used for drawing - larger sized tablets are used for more detailed work.

Mouse pen	Granada Learning Ltd/SEMERC
Various graphics tablets eg Wacom, Micrograf	Micrograf, major Mail order suppliers eg Action Computer Supplies

Screen based ideas: touch screens, light pens

Here selections and movements are made by pointing at the screen surface. Touch screens act in the same way as a normal screen but have sensitive surfaces. It is also possible to put a "Touch Window" over the front of a standard monitor to give the same function. A lightpen is a similar idea, requiring you to hold a pen and point it at the screen.

Touch Screens	Granada Learning Ltd/SEMERC, Inclusive Technology, Tyco Electronics, 3M Touch Systems, Keytools
Lightpen	Computerware
Touch Window	Granada Learning Ltd/SEMERC

Using head movement

Here the pointer is moved across the screen simply by moving your head slightly. These systems are costly (over £1000). They work well with on screen keyboards. Normally a switch is used to do the equivalent of a mouse click.

Tracker 2000	Liberator
HeadMouse	Don Johnston, Techcess

Foot controlled devices

Some of the larger rollerballs can be used with the feet. Other devices designed specifically for foot operation include the "No Hands Mouse" shown below.

 **"No Hands Mouse"**	"No Hands Mouse which uses two "paddles" to move and click the mouse. One paddle is used to control movement, the second paddle is used to send clicks. www.footmouse.com

Other ways of clicking

We often see people who can use a pointing device to move the pointer around the screen but have difficulty clicking. Here it is worth remembering that the click does not have to be on the pointing device itself. You could: turn on mousekeys and use a button on the keyboard to click and drag

connect your pointing device to the computer via a mouse box and plug any kind of switch into that box. Granada Learning Ltd/SEMERC have been developing a “Mouser” for this function.

Automated clicks

There are a number of software utilities which will detect when your mouse has stopped moving and then send a click. These utilities work well with pointing devices which can be accurately controlled and in “clicking intensive” applications e.g. Internet, CD-ROMS

MouseTool	Shareware: available from www.shareware.com
Dragger	Don Johnston

Related factsheets available from AbilityNet

This factsheet attempts to give an overview of the options available. More detailed information on specific subjects is given in separate sheets:

- Accessibility Options in Windows
- Keyboard shortcuts in Windows
- Single Handed Keyboard Use
- Repetitive Strain Injury
- Voice Recognition Systems

March 2004