Creating Access to PlaneMath

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Built-In Access By Design

PlaneMath is designed to be as accessible as possible for a variety of users, within the limits of the Internet and the browsers themselves. For instance:

- Buttons are large (1 inch wide by 1/2 inch tall) and consistently located along the bottom or edge of the screen.
- The background is set to white and the recommended text size is 18 point, for better clarity.
- Graphics are clear and motivating, and support student understanding of activities.
- Text and graphics on each screen are kept to a minimum to avoid the use of both horizontal and vertical scroll bars. This makes the site easier to navigate physically and makes the site less confusing for students with learning difficulties.
- A text-only version mirrors all activities and pages in the PlaneMath website for those with text-only browsers or people with visual impairments who use screen readers.
- Every image in PlaneMath includes an "alt tag" which gives a written description of the image for people who cannot see the images due to vision difficulties or the limits of their modem speed or browser.

Beyond the built-in features of PlaneMath, the activities can be made even more accessible to students with significant needs by using a variety of software and hardware adaptations, such as switches, IntelliKeys, on-screen keyboards, and more. These tools can enhance physical, visual and learning access to PlaneMath and are described later in this document.

Internet Browser Access & Assistive Technology

Beyond the built-in features of PlaneMath, access may depend on your Internet browser, or the interaction between the browser and other assistive technology.

As you may know, the Internet can be thought of as a huge body of data and programs, all contained on thousands of computers, linked together in a vast network. The World Wide Web, or just Web, is a subset of the Internet, consisting of all of the data on the interconnected computers that is stored in primarily in HTML form. HTML (Hyper Text Markup Language) allows data to be stored in a way that can be presented in a graphically interesting manner, and more importantly, allows information in one document to be linked to data in another document on another computer. By activating these links between documents,

the user can go from one bit of information to another as though they were all stored sequentially on the same computer, instead of being scattered on different machines around the world.

Information on the Web is accessed by means of software called browsers. These programs interpret the codes embedded in the HTML documents (or Web pages), and display the documents graphically. They also manage the process of following the links contained in the documents to information on other computers.

The tremendous amount of information available on the Web is especially valuable for people with disabilities, it also poses some unique access problems.

While a person's home computer can be modified for access, the data on the Web is not under the user's control, and may not be presented in an accessible manner. For example, some Web pages contain text information, while others display a picture of text - one can be read by a blind user's screen reader, the other cannot. Similarly, some links are designated by underlined text, whereas others may activated by clicking on an area of a graphic image. There is no consistency to the placement of links; they can appear anywhere on a page. The designers of PlaneMath are aware of these problems and have used a consistent design that should ease the creation of access using assistive software or hardware.

BROWSER SOFTWARE
There are two major commercial browsers: Netscape Navigator (in the newest version, a part of Netscape Communicator), and Microsoft's Internet Explorer. These programs are available for both the Macintosh and Windows 95 platforms. There are also several special purpose browsers, such as PwWebSpeak, a specialized browser for blind access.

The America OnLine browser is a version of Internet Explorer, but is very much more difficult to access, due to a lack of menu bar features and a heavy reliance on graphics. Some of the concepts we'll be looking at apply to AOL, but this software is generally not a good choice if you are trying to adapt a computer for access to the Web.

As usual, the access issues break down into those affecting the user's ability to input information into the computer, processing aids to simplify or accelerate the operation of the computer, and issues affecting output of information from the computer.

INPUT METHODS

Mouse Access
Most aspects of Web browsing can be easily accomplished without a keyboard. Because links can appear anywhere on a Web page, they are most conveniently accessed by clicking with a mouse or alternative pointing device. Additionally, most browsers have toolbar icons, buttons, and menu options that allow everything to be controlled by mouse. As a consequence, people who can use the mouse (or an alternative pointing device) can operate Web browsers fairly easily.

Students who cannot use the standard mouse may be able to use a trackball or an alternative pointing device. Many students are able to use a trackball that has a medium to large-sized, easily movable ball with a "locking" button to allow one-handed point-and-drag. The Kensington, Stingray, and P.C. Trackball II are examples. Alternative pointing devices that use infrared technology include the Headmaster from Prentke-Romich and Madenta's Tracker, for students with good head control. The Edmark TouchWindow is a direct-select alternative.

Keyboard Access for Text Entry
In using PlaneMath, as when browsing the Web, the need to enter text is infrequent. One text item that may need to be entered is the URL (the unique Internet address of each Web page) of a page you want to go to. This is not a lot of text, however, and once you get to the page, you can bookmark it, so that you or your students never have to type in the URL again. Most of the time, you get to a page by following links, not by entering its address. Web users may also need to enter text in a search engine, which is software, accessed with a browser, that searches the Web for pages containing certain words or phrases. This is generally only a few words of text, however. It also may be necessary at times to enter text into a form, such aswhen registering to download software. There's little enough text that occasional use of an onscreen keyboard would provide fairly complete access to a browser for someone who could use a mouse or mouse emulator.

Of course, there are other online tasks that do require text input, such as writing e-mail and communicating in chat rooms. These carry the same demands as writing within a word processor and the same solutions should apply. For instance, a student using an alternate keyboard can use the same keyboard at the PlaneMath site.

Keyboard Commands to Replace Mouse Commands
Some people have difficulty using the mouse, so a crucial physical access issue is the ability to use keyboard commands to control Web browsers. Once we know the essential keyboard commands, we can create a customized keyboard overlay for an alternative keyboard such as IntelliKeys or Discover Board, or we can create a custom switch scanning matrix. We can use Morse Code, or conveniently make speech macros for a voice input system.

Obviously, what's "essential" depends on the user's needs. These functions below, especially if combined with a set of pre-made bookmarks, would be a good starting point for a kid, for example. More sophisticated users, or those wanting to do online research, would need more functions, especially access to a search engine.

Essential Browser Functions
    Forward
    Back
    Access Bookmark
    Create Bookmark
    Move through Page
    Select and Activate Links

Other Key Functions
    Home
    Stop loading
    Open a URL (requires text entry ability)
    Move through data entry fields
    Access and select from History
    Find text in Page
    Load Images (if autoload has been turned off for speedier operation)
    Close Window
    Access a search engine (requires text entry ability)

On the Macintosh, a keyboard utility like ClickIt!, which provides access to menu items, can overcome most physical access barriers except the biggest one: there is no way to select and activate links on the Macintosh with using a mouse or mouse emulation. Netscape Navigator is marginally easier to use than Internet Explorer, primarily because it makes access to hierarchical bookmark and history lists easier.

On Windows-based machines, keyboard access to the menus is built-in. Their primary advantage is that the Windows versions of Internet Explorer, and the newest version of Netscape, allow links to be selected by pressing the Tab key, making the entire program keyboard accessible.

Details on keyboard access techniques for different browsers are contained in the advanced section at the end of this document. More information on Windows keyboard equivalents can be found at:
http://www.microsoft.com/kb/articles/q126/4/49.htm

Product Suggestions
Products that create alternatives to keyboard input include:

<u>Alternative programmable keyboards for Windows</u>
IntelliKeys keyboard and Overlay Maker (www.intellitools.com)

Morse Code access to Windows 95
EZKeys for Windows from Words+ (words-plus.com)
Darci Card (www.darci.org)
EZMorse (Neil Squire Foundation, 604-473-9363)

Single switch scanning software for Windows 95
EZKeys
Switch Clicker Plus (www.cricksoft.com)
WiViK2Scan (www.prentrom.com)

Morse Code access to Windows 3.1
EZKeys and EZMorse

Single switch scanning software for Windows 3.1
MSI's HandiKey (www.handiware.com)
Prentke-Romich's Wivik2Scan (www.prentrom.com)
EZKeys

Alternative programmable keyboards for Macintosh
IntelliKeys keyboard and Overlay Maker (www.intellitools.com).
Don Johnston's Key Largo and Discover Board (www.donjohnston.com)

Morse Code access to Macintosh
Discover Ke:nx (www.donjohnston.com)

Single switch scanning software for Macintosh
Discover Switch (www.donjohnston.com)

Voice Input
Most voice input systems are not very good at controlling the mouse; it tends to
be a pretty cumbersome process ("mouse up", "stop", "mouse left"). Therefore,
keyboard based Web access methods will be helpful in using voice input as well.
With the keyboard commands listed in the Advanced Applications of this
document, you can make a speech macro for use with any voice application that
works directly with the browser.

Two very inexpensive alternatives are IBM VoiceType Connection for Netscape
(Windows 95, www.ibm.com) and SurfTalk for Netscape (Macintosh,
www.surftalk.com). These are voice input applications designed solely to control
the Netscape Navigator Web browser (version 3); SurfTalk works in conjunction
with Apple's PlainTalk speech recognition program. Although limited in
features, both programs allow you to activate links on a Web page simply by
speaking the name of the link.

OUTPUT
Adapting the output of a computer - which is primarily comprised of the information displayed on the monitor screen - can take the form of modifying this visual output, or supplementing or replacing it with auditory output.

Enlargement
Modifying the visual output usually means enlarging the text, or the cursor, or the entire displayed image. Enlarging the text and changing the font can be accomplished within the preferences controls of the browser itself.

There are several utility programs that enlarge the cursor for better visibility: Biggy (from RJ Cooper) and Fat Cursor (shareware) for the Macintosh, MetaMouse (shareware) for Windows 3.1, and ToggleMouse (shareware) and Biggy (RJ Cooper) for Windows 95. Larger cursors are also available in the Mouse control panel of Windows 95.

Enlargement of the entire displayed image can be accomplished with a screen magnification program, like inLarge for the Macintosh (Alva Access), or ZoomText (AI Squared), LPWindows (Optelec), or Magic (MSI) for Windows. Screen magnification programs can be difficult to use, however, since only a part of the enlarged image can be displayed on the monitor at a time; it can be very hard to keep track of your place.

The visual image can also be modified by altering the color of the text and background for better contrast. Most Web browsers allow the user to control this feature, most screen magnification programs also incorporate color control, and Windows 95 has a high-contrast display setting built into its accessibility control panel.

Voice Output: Text-to-Speech
Text-to-speech programs that speak highlighted text can be helpful to people with learning disabilities or low vision in accessing text on Web pages. The primary difficulty is when words on a page are presented as graphics, rather than actual text; the text-to-speech programs cannot read this, nor can the screen readers relied upon by blind users.

IntelliTools' ClickIt! program will read aloud highlighted text, but it can only read a couple of lines. For those who already own ClickIt!, using it with a talking word processor (Simple Text) is described in the advanced section. A better option is MacYack Pro (Scantron Quality Computers, www.lowtek.com), which has much greater capacity; it also allows you to assign different voices to different typefaces or styles. pronounce different styles and typefaces. For Windows, Text Assist (software bundled with some SoundBlasters) is an option, as is Monologue (www.firstbyte.davd.com) and TextHelp(www.loriens.com).

The soon-to-to-be-released version of Ultimate Reader functions like a talking Web browser. It re-formats columnar and framed text to display it in simple format, and will read aloud text while highlighting it. It is very mouse-intensive in its operation. Information can be found at www.cast.org.

The deluxe version of the Kurzweil 3000 text reading system (www.kurzweiledu.com), designed to read aloud and highlight text for users with learning disabilities, will read Web pages aloudwhen used with Internet Explorer.

Voice Output: Screen Readers
A screenreader is software that will audibly interpret the graphical information sent to the display screen by the computer. There are a number of these programs available, all of which deal somewhat differently with the problem of presenting the unpredictable graphic data produced by the Web browsers in audible form. All activities within PlaneMath are mirrored in a text-only version for people who cannot access graphics and/or for people who use screen readers.

The job of audibly representing the two-dimensional, simultaneously displayed, graphical information in the Mac and Windows environment is a complicated one, and these products take some training to be used effectively. On Windows-based machines, they also require a speech synthesizer to produce sound output. There are a number of external synthesizer devices available; some screenreaders support the TextAssist text-to-speech engine packaged with some SoundBlaster sound cards.

Screenreaders include:

- JAWS for Windows - Henter-Joyce, Inc. (http://www.hj.com)

- outSpoken for Windows/outSpoken for Macintosh - Alva Access (aagi.com)

- WindowEyes - GW Micro, Inc. (www.gwmicro.com/)

- ScreenPower for Windows - Telesensory (www.telesensory.com/)

- pwWebSpeak - Productivity Works (www.prodworks.com) - This is not a general-purpose screenreader like the software listed above, rather it is a talking Web browser. It does not interpret the information being sent to the screen by a conventional Web browser; instead, it interprets the underlying HTML language directly. Because it is a stand-alone application, the user must turn off his or her regular screenreader, start pwWebSpeak with a hot key, and when finished on the Web, reactivate his or her screenreader. The

software is available for the personal use of blind and visually impaired users for a $50 annual fee.

Most of these products have a downloadable demo version. Hints for configuring the browser to work with a screenreader are contained in the advanced section of this document.

Advanced Assistive Technology Applications with PlaneMath

This section is for users who are familiar with specific pieces of assistive technology or who are skilled in creating access using system resources.

USING CLICKIT! TO CREATE TEXT TO SPEECH FOR THE MACINTOSH
If you have ClickIt! and SimpleText (or any talking word processor), it is also possible, though somewhat cumbersome, to set up options for speech output when using PlaneMath. ClickIt! allows users to access menus using keyboard shortcuts and in this mode ClickIt! can read menu items aloud. If students need to hear text read aloud, due to low vision or limited reading ability, this can be accomplished by running SimpleText (or a talking word processor) in the background, selecting and copying all text on a PlaneMath page (⌘A, ⌘C), then switching to SimpleText, deleting previously pasted text (⌘A, delete) and pasting the copied text (⌘V), then using the speak text command (in SimpleText, it's ⌘H). Using this strategy, it's even possible to hide the SimpleText window off the edge of the screen so the PlaneMath page remains visible while the text is being spoken aloud. While this sounds complicated, macros created by programs like AppleScript, QuicKeys or OneClick can combine all these steps into a single click or keystroke. Alternatively, these steps could be built into key(s) on IntelliKeys, with the help of ClickIt!, or into a Ke:Nx / DiscoverSwitch setup.

ALTERNATE BUTTON PALETTES
A customizable onscreen keyboard such as Discover:Screen (Macintosh, Don Johnston), HandsOff (Windows95, Zygo), or WiViK2 (Windows 95, Prentke-Romich), or a macro utility like OneClick (Macintosh, Scantron Quality Computing), can be used to create an alternative button palette for your browser using keys that are useful to the student. The alternative buttons, which activate the appropriate browser commands (create a bookmark, open the PlaneMath Web page, copy and paste text into a word processor), can provide shortcuts for students with physical disabilities, easier to see tools for students with low vision, and graphic reminders of tools, actions and options for students with learning disabilities. These tools can also be helpful for students without any particular identified special need.

KEYBOARD ACCESS BY BROWSER
The following list of keyboard access techniques is designed to provide the raw materials necessary to create Morse Code macros, switch scanning matrices, and alternative keyboard overlays for controlling Web browsers. Remember , in addition to the functions listed below, everyone will need an enter key .

Netscape for Macintosh:

Keyboard Access to Basic Commands
• Forward: ClickIt hot spot on Toolbar or Command-]
• Back: ClickIt hotspot on Toolbar or Command-[
• Access Bookmarks: ClickIt menu access or Command-B. Either way, the up and down arrow
    keys will move through the bookmarks If using ClickIt menu access, the left and right arrows
    will open sub-folders If using Command-B, the return key will open the nested subfolders
    ClickIt menu access in the newest version is tricky, because there is a menu bar icon , so
    ClickIt cannot underline a letter. You have to access an adjacent menu item and move to the
    Bookmark menu with the arrow keys
• Create Bookmark: Command-D
• Move through Page: PageUp and PageDown keys, or up and down arrow keys.
• Select and Activate Links: Can only be done with mouse or mouse emulator
• Home: Command-home if you have a home key, or ClickIt hotspots or menu access.
• Stop loading: Command-. will work in theory, but Netscape warns it may cause errors. Using a
    ClickIt hotspot on the Toolbar icon is safer
• Open a URL (requires text entry ability): Command-L
• Move through data entry fields: Tab key
• Access and select from History: In previous versions of Netscape, Command-0.....5 would select
    previously visited pages, in chronological order. This is no longer supported in the newest
    release. Command-H will access a window containing the history list, but it can't be
    navigated except by mouse. ClickIt menu access, however, will display a drop-down history
    list that can be navigated with the up and down arrow keys
• Find text in Page: Command-F
• Load Images (if autoload has been turned off for speedier operation): Command-I
• Close Window: Command-W

Built-In Features
• Can adjust font and size.
• Can set text, background, and highlighting colors - can override the settings on
    individual pages.
• Can set to bypass the loading of images for faster navigation - when a page is
    reached where the images want to be seen, Command-I will load them for
    that page.
• Netscape can be set to start at a specified page.

Other Features
• You can set up multiple users with different preferences (e.g., font size) on a
    single machine, by creating separate preference folders for each user, and
    then starting Netscape by clicking on the appropriate preference file.
• If you save a Web Page to your hard disk as a file, Netscape will put the URL
    in the "Get Info" box.
• You can create aliases to individual web sites by dragging their links to the
    desktop.

Problems

- Most serious shortcoming is that there is no way to select a link except by clicking on it. No Macintosh browser has this essential function. If not for this, Netscape could be made almost entirely accessible with ClickIt!.
- The newest Navigator has a page-loading-progress bar that is grey on grey. which is very hard to see.
- Beware of a trap in the newest Navigator: the "Security" Toolbar icon. Clicking on this will open a window that cannot be closed except by mouse. It has buttons on it, but ClickIt cannot access them, and there is no menu command to close it without exiting Netscape.

Internet Explorer for Macintosh:

Keyboard Access to Basic Commands

- Forward: ClickIt hot spot on Toolbar or Command-]
- Back: ClickIt hotspot on Toolbar or Command-[
- Access BookMarks: ClickIt menu access or hotspot on Favorites icon Clicking on the Favorites icon will open a window containing the bookmarks. You can move up and down this list with the up and down arrow keys. But if there are unopened sub-folders in the list, they cannot be opened without clicking on them If using ClickIt menu access, the left and right arrows will open the sub-folders
- Create BookMark: Command-D
- Move through Page: PageUp and PageDown keys, or up and down arrow keys
- Select and Activate Links: Can only be done with mouse or mouse emulator
- Home: Command-home if you have a home key, or ClickIt hotspots or menu access
- Stop loading: Command-. will work in theory, but it may cause errors. Using a ClickIt hotspot on the Toolbar icon is safer
- Open a URL (requires text entry ability): Command-L
- Move through data entry fields: Tab key
- Access and select from History: Command-H will open a window containing the history list. You can move up and down this list with the up and down arrow keys. But if there are unopened sub-folders in the list, they cannot be opened without clicking on them Accessing the menu bar with ClickIt will display a drop-down history list that can be navigated with the up and down arrow keys
- Find text in Page: Command-F
- Load Images (if autoload has been turned off for speedier operation): Command-I
- Close Window: Command-W

Built-In Features

- Can adjust font and size.
- Can set text, background, and highlighting colors - can override the settings on individual pages.
- Can set to bypass the loading of images for faster navigation - when a page is reached where the images want to be seen, Command-I will load them for that page.
- Explorer can be set to start at a specified page
- Changing font and text size can be done from the menu bar (rather than just in Preferences). Font size can be adjusted with Toolbar icons

- Explorer preferences can be accessed from a Toolbar icon as well as though a menu.
- Has a Toolbar icon that will access a selected search engine's home page (which will require text entry ability.)

Other Features
- Internet Explorer incorporates a "download manager" which allows you to download files in the background while you continue to navigate the Web.
- Explorer can save the history of sites visited over multiple session, storing each session in a dated subfolder in the history list.

Problems
- Most serious shortcoming is that there is no way to select a link except by clicking on it. No Macintosh browser has this essential function. If not for this, Explorer could be made almost entirely accessible with ClickIt!.
- Subfolders in the History and Bookmarks list cannot be accessed without a mouse if the lists is opened with command key shortcuts. Activating this list through the menu bar (with ClickIt!) avoids this problem. There does not appear to be any way to clear the History list except by dragging its contents to the Trash Can.

Netscape for Windows (up to version 3):
This program's accessibility is almost identical to the Macintosh version, except that Window's built-in keyboard commands make ClickIt unnecessary for menu access.

Keyboard Access to Basic Commands
- Forward: <ALT>right arrow
- Back: <ALT>left arrow
- Access BookMarks: <ALT>B (menu access) or <CTRL>B (brings up window) Either way, the up and down arrow keys will move through the bookmarks If using <ALT>B menu access, the left and right arrows will open sub-folders If using <CTRL>B, the return key will open the nested subfolders.
- Create BookMark: <CTRL>D
- Move through Page: PageUp and PageDown keys, or up and down arrow keys
- Select and Activate Links: Can only be done with mouse or mouse emulator
- Home: <ALT>G H
- Stop loading: <ESC> or <ALT>G S
- Open a URL (requires text entry ability): <CTRL>L
- Move through data entry fields: Tab key
- Access and select from History: <ALT>G will access this through a menu; the consecutively visited pages can then be accessed by number. <CTRL>H will access a window containing the history list, which can be navigated by arrow keys
- Find text in Page: <CTRL>F
- Load Images (if autoload has been turned off for speedier operation): <CTRL>I
- Close Window: <ESC> or <ALT>F4

<u>Built-In Features</u>
- Can adjust font and size.
- Can set text, background, and highlighting colors - can override the settings on individual pages.
- Can set to bypass the loading of images for faster navigation - when a page is reached where the images want to be seen, <CTRL>I will load them for that page.
- Netscape can be set to start at a specified page.

<u>Problems</u>
- Most serious shortcoming is that there is no way to select a link except by clicking on it. The most recent version of Netscape for Windows addresses this problem.
- Since there is no ClickIt for Windows yet, there is no way to access the Toolbar except by mouse. However, since all of these functions are duplicated in the menus, which are keyboard accessible, this is not a serious problem.

Netscape Communicator for Windows (version 4):
This program is similar in appearance to the latest Macintosh version, except that Window's built-in keyboard commands make ClickIt unnecessary for menu access. More importantly, it provides keyboard access to links.

<u>Keyboard Access to Basic Commands</u>
- Forward: <ALT>right arrow
- Back: <ALT>left arrow
- Access BookMarks: <ALT>C B (menu access) or <CTRL>B (brings up window.) Either way, the up and down arrow keys will move through the bookmarks, and the left and right arrows will open nested subfolders.
- Create BookMark: <CTRL>D
- Move through Page: PageUp and PageDown keys, or up and down arrow keys
- Select and Activate Links: Tab Key
- Home: <ALT>G H
- Stop loading: <ESC> or <ALT>V S
- Open a URL (requires text entry ability): <CTRL>L
- Move through data entry fields: Tab key
- Access and select from History: <ALT>C H and <CTRL>H will both display a window containing the history list, which can be navigated by arrow keys. <ALT>G will access a menu-based history list, from which visited pages can be selected by number.
- Find text in Page: <CTRL>F
- Load Images (if autoload has been turned off for speedier operation): <CTRL>I
- Close Window: <ESC> or <ALT>F4

<u>Built-In Features</u>
- Can adjust font and size, both within preferences, and dynamically, by <CTRL>] to enlarge and <CTRL>[to decrease.
- Can set text, background, and highlighting colors - can override the settings on individual pages.

- Can set to bypass the loading of images for faster navigation - when a page is reached where the images want to be seen, <CTRL>I will load them for that page.
- Netscape can be set to start at a specified page.
- Has a Toolbar icon and a menu item (<ALT>E I) that will access a selected search engine's home page (which will require text entry ability.)
- Most significant feature is that the user can step through the links on a page with the tab key. The links are surrounded with a box when they are selected in this fashion, even links contained within image maps. This makes the entire program accessible from the keyboard, and, therefore, with an alternative keyboard or switch access method.

Problems
- Since there is no ClickIt for Windows yet, there is no way to access the Toolbar except by mouse. However, since all of these functions are duplicated in the menus, which are keyboard accessible, this is not a serious problem.

Internet Explorer for Windows 95 (up to version 3)
This program is similar in appearance to the Macintosh version, except that Window's built-in keyboard commands make ClickIt unnecessary for menu access. More importantly, it provides keyboard access to links.

Keyboard Access to Basic Commands
- Forward: <ALT>right arrow or <SHFT>Backspace
- Back: <ALT>left arrow or Backspace
- Access BookMarks: <ALT>A (menu access) - the up and down arrow keys will move through the bookmarks. <CTRL>B will open a bookmarks "editing" window, from which bookmarks could be accessed, but it requires elaborate sequences of tab, arrow, and <ALT>letter keys to navigate.
- Create BookMark: <ALT>A A
- Move through Page: PageUp and PageDown keys, or up and down arrow keys.
- Select and Activate Links: Tab Key
- Home: <ALT> G S
- Stop loading: <ESC> or <ALT>V P
- Open a URL (requires text entry ability): <CTRL>O
- Move through data entry fields: Tab key
- Access and select from History: <ALT>G H and <CTRL>H will both display a window containing the history list, which can be navigated by arrow keys. <ALT>G will access a menu-based history list, from which visited pages can be selected by number .
- Find text in Page: <CTRL>F
- Load Images (if autoload has been turned off for speedier operation): Although images can be turned off in preferences, there appears to be no way to load them for individual pages once this is done, other than image by image.
- Close Window: <ESC> or <ALT>F4

Built-In Features
- Can adjust font and size within preferences, or dynamically, by using the toolbar or the menu (<ALT>V F)

- Can set text, background, and highlighting colors
- Can set to bypass the loading of images for faster navigation, but there appears to be no way to later load these images for individual pages, except by clicking on, and then loading, each individual image. Explorer can be set to start at a specified page. Has a Toolbar icon and a menu item (<ALT>G W) that will access a selected search engine's home page (which will require text entry ability.)
- A line can be added to the Toolbar containing buttons for several user-specified web sites. Most significant feature is that the user can step through the links on a page with the tab key. The links are surrounded with a box when they are selected in this fashion, even links contained within image maps. This makes the entire program accessible from the keyboard, and, therefore, with an alternative keyboard or switch access method.

Other Features
- Internet Explorer incorporates a "download manager" which allows you to download files in the background while you continue to navigate the Web.
- Explorer can save the history of sites visited over multiple session, storing each session in a dated subfolder in the history list.

Problems
- Toolbar items are not keyboard accessible, but most of their functionality, if not their convenience, is duplicated in the menu bars.
- Inability to load images for an individual page if the "load image" option is turned off in preferences is a nuisance. The user must choose between the slowdown resulting from loading all images, or the cumbersome process necessary to view individual images on a page.

Internet Explorer for Windows 95 (version 4)

The operation of Internet Explorer version 4 departs significantly from earlier versions of this program, and poses problems when used with some adaptive technology. We do not presently recommend using this browser. Information on adapting it for access will be distributed once future revisions of version 4 resolve these problems.

HINTS FOR USING A SCREEN READER WITH AN INTERNET BROWSER

1. Turn off any unnecessary features in the browser,
    i.e. Tool Bar, Button Bar and Favorites Bar.
    All of these take up screen space and are duplicated in menus. They can also be distracting because they will be spoken as "graphic."

2. Turn off "Loading Images."
    Auto loading of images and multimedia clips slows down access.

Not loading images allows display of "alt tags" - text tags which should be present to describe the graphics.
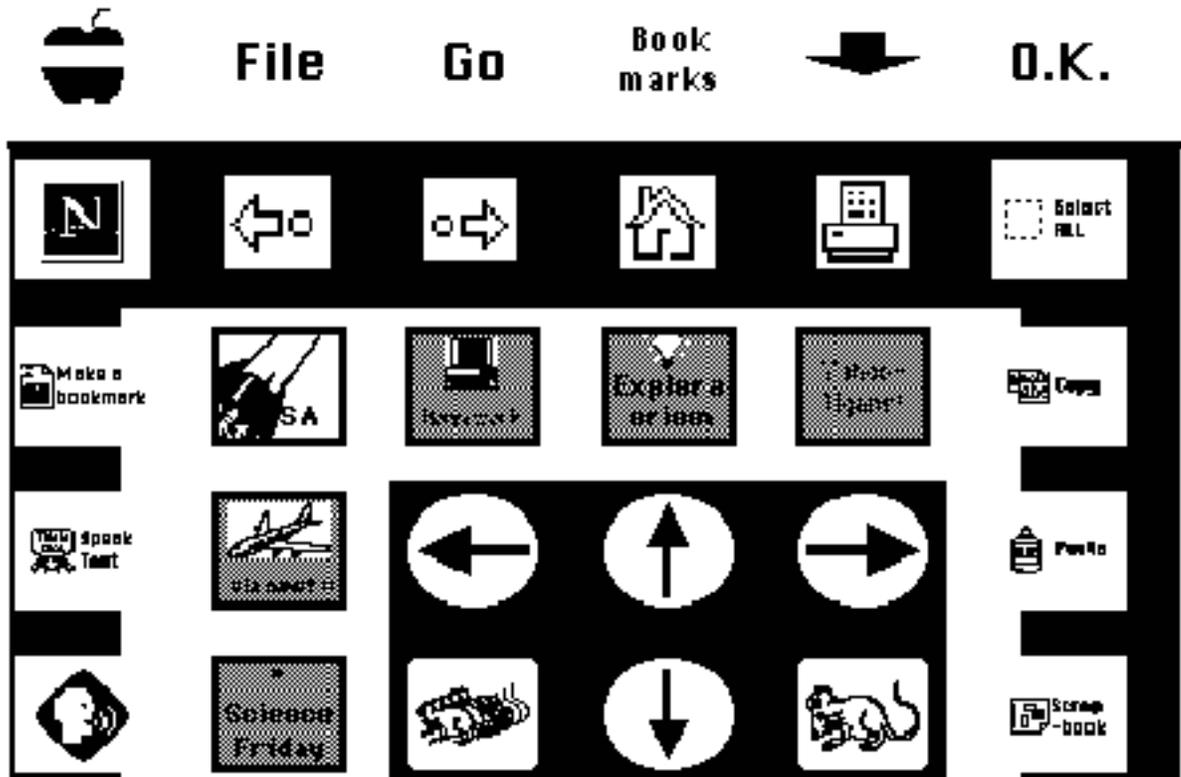
3. Maximize the browser window, minimize all others.
   Temporarily: Click the middle button in the upper right corner of window
   Permanently: See directions in Win 95 Help.
   From Keyboard: ALT+SPACE then press X to maximize and ALT+SPACE then press N to minimize.

Sample Netscape Overlay

This overlay was created to provide functions that a student might need while exploring the Internet. Six sites (NASA, PlaneMath, Science Friday, Homework, Exploratorium and Yahooligans) have been given buttons for easy access. Copy, paste, and go to scrapbook allow a student to collect graphics and text from sites for use in a report or project. Netscape buttons include forward, back, home, print, and make a bookmark. Two additional buttons on the lower left side of the overlay invoke macro's for speaking text, and for changing to a word processor.

Sample PlaneMath Overlay
This overlay was created to work with a number of activities by providing buttons that correspond to the location of answer buttons.

This button will return you to the PlaneMath Home Page.

These are the answer buttons. The labels will change so pay attention to the location.

GO
BACK

| 1 | 2 | 3 | 4 | 5 |