Introduction to ScreenReaders

High Tech Center Training Unit
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Foothill – De Anza Community College District
California Community Colleges
# Introduction to ScreenReaders

## Day 1

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:00 AM</td>
<td>Introduction</td>
</tr>
<tr>
<td></td>
<td>Objectives</td>
</tr>
<tr>
<td></td>
<td>Introduction to ScreenReader Technology</td>
</tr>
<tr>
<td>11:45 AM</td>
<td>Lunch</td>
</tr>
<tr>
<td>1:00 PM</td>
<td>Activities with ScreenReaders</td>
</tr>
<tr>
<td></td>
<td>Using Windows with ScreenReaders</td>
</tr>
<tr>
<td></td>
<td>Introduction to:</td>
</tr>
<tr>
<td></td>
<td>WindowEyes</td>
</tr>
<tr>
<td></td>
<td>SuperNova</td>
</tr>
<tr>
<td>2:15 PM</td>
<td>Break</td>
</tr>
<tr>
<td>2:30 PM</td>
<td>Activities with ScreenReaders</td>
</tr>
<tr>
<td></td>
<td>Introduction to JAWS</td>
</tr>
<tr>
<td></td>
<td>Introduction to NVDA</td>
</tr>
<tr>
<td>4:30 PM</td>
<td>End</td>
</tr>
</tbody>
</table>

## Primary Goals

Participant will be able to do the following:

1. Understand the functional skills necessary to use a ScreenReader
   a. Perform a series of structured activities with each Screenreader
   b. Describe each ScreenReader
2. Understand how Screen Readers work
3. Understand the necessary skill set for use of a ScreenReader
4. Understanding of how to create screen reader-friendly materials
Introduction to Screen Readers

Ron Stewart
Access Technology Instructor
High Tech Center Training Unit

Welcome

- Demonstrate four screen readers: JAWS, SuperNova, WindowEyes and NVDA
- Basics of how ScreenReader work, and considerations for evaluating them
- Hands-on experimentation
- Considerations for creating screen reader friendly materials
- Considerations for teaching screen readers skills to students
History of ScreenReader

• TTS Overview
  Synthetic rendering of textual information in an audible form.
  1. Dictionary and rules used for textual analysis
  2. Library of sounds used to create proper phonetic structures (phonemes)
  3. Final rendering of speech waveform

History of ScreenReader

• How TTS works

  Text → Analysis → Phoneme Creation → Library of Sounds → Dictionary & Rules
History of ScreenReader

• Command Line Interface (CLI)
  – Text based
  – Specific command control
  – Linear Representation

• GUI Interface
  – Multiple synchronous operations
  – Visual symbology vs. abstract conceptualization
  – Issues of focus...

History of ScreenReaders

• Mac
  – Voiceover

• Linux
  – Emacspeak, YASR, Speakup
  – Gnopernicus, Orca, LSR

• Dos
  – Provox, Model T Reader, Tiny Voice
  – JAWS, Hal, Vocal-Eyes
History of Screen readers

Current brands we should be familiar with:

– JAWS
– WindowEyes
– Supernova/HAL
– NVDA
– VoiceOver

History of Screen readers

JAWS (Job Access With Speech)

• First released in 1989
• Originally for DOS
• JFW released 1995
• JAWS 9 current version
History of Screen readers

VocalEyes introduced in 1990
WindowEyes introduced in 1995
• Utilizes Windows keystrokes
• WindowEyes 7.5 current version

History of Screen readers

Supernova Access
• HAL for DOS released 1986
• HAL for Windows 95 released 1996
• Supernova released in 1998
• Supernova 12 current version
Core Competencies

- Basic OS Familiarity
- Application-Specific Knowledge
- Screen Reader-Specific Knowledge
- User Skills
- Knowledge of Focus
- Knowledge of Mode
- Knowledge of Content Type

Core Competencies

- Basic Understanding of Interface
- GUI Interface Basics
  - Focus: awaiting your command
  - Selection: specify
  - Activation: perform
  - Mouse Actions: combine focus, selection, activation
Core Competencies

• Knowledge of Application
  – Core features of application
  – Navigation style & potential
  – Keyboard commands
  – Basic understanding of interface layout

Core Competencies

• Knowledge of Screen Reader Application
  – Inspection features of screen reader
  – Navigation features of screen reader
  – Keyboard commands
Core Competencies

• User Skills
  – Touch typing
  – Auditory learning
  – Memory/Recall

Document Considerations

• Audio Representation of Visual Information
  – Design dependent
  – Proper use of structural elements
  – Requires advance labeling of charts/graphics

• Linearization of Documents
  – Priority of information
  – Sidebars, figures, and tables
Application Considerations

• Structure of Interface
  – Menu bars and Tool bars
  – Status and information displays
  – Application-specific keystrokes
• Competing Audio Feedback
• Accessible help files

Screen Reader Navigation

• Understanding of Structure
• Reliable Points of Reference
• Keyboard vs. Mouse Control
• Discovering the Unknown
Finding the Focus

• Interface Focus
• Screen Reader Focus
  – Document Object
  – Virtual Focus
• Home Base

Media Considerations

• Screen Reader Friendly Media:
  – Logical design and layout
  – Use of headings
  – Proper tags in HTML & XML docs
  – Simple tables
Comparing Screen Readers

• The Big Four
  – Window-EYES
  – SuperNova
  – JAWS
  – NVDA
Screen Reader Day Activity Materials List

Activities

I. Where are you?
   A. Windows Keyboard commands for navigation and interaction

Tasks
   1. Bring up Desktop
   2. Bring focus to task bar
   3. Open the START menu
   4. Open System Properties Dialogue
   5. Find program in "Add/Remove Programs" Dialogue

Materials
   1. Windows Keyboard Commands
   2. Task List with specific commands (job aid)

B. What's the time?

Tasks
   1. Use screenreader key commands to read system time
   2. Review Windows Keyboard commands

Materials
   1. Windows Keyboard Commands
   2. Task List with specific commands (job aid)

C. What program are you using?

Tasks
   1. Have students go to Start Menu (or special folder) and open the program or folder that corresponds to their computer number
   2. Attempt to perform a basic function of the program
   3. Everyone switch seats
   4. Using keyboard commands and screen-reader specific commands, identify which program is now open
Materials
1. Windows Keyboard Commands
2. Task List with
   a. Specific commands highlighted (job aid)
   b. Specific program assignment

II. Read a Word Document

Tasks
1. Open Microsoft Word
2. Open document
3. Read document

Materials
1. Windows Keyboard Commands
2. Task List with specific commands (job aid)

III. Create/Edit a Word Document

Tasks
1. Open Microsoft Word
2. Open document or create new document
3. Edit/create document

Materials
1. Windows Keyboard Commands
2. Task List with specific commands (job aid)
3. Document to edit, or requirements for fresh document

IV. Read a PDF

Tasks
1. Open PDF document (multiple ways)
2. Read document

Materials
1. Windows Keyboard Commands
2. Sample document(s)
# Windows® Keyboard Commands

## General keyboard-only commands

<table>
<thead>
<tr>
<th>Key Sequence</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>Starts Windows Help</td>
</tr>
<tr>
<td>F10</td>
<td>Activates menu bar options</td>
</tr>
<tr>
<td>SHIFT+F10</td>
<td>Opens a shortcut menu for the selected item (this is the same as right-</td>
</tr>
<tr>
<td></td>
<td>clicking an object</td>
</tr>
<tr>
<td>CTRL+ESC</td>
<td>Opens the <strong>Start</strong> menu (use the ARROW keys to select an item)</td>
</tr>
<tr>
<td>CTRL+ESC or</td>
<td>Selects the <strong>Start</strong> button (press TAB to select the taskbar, or press</td>
</tr>
<tr>
<td>ESC</td>
<td>SHIFT+F10 for a context menu</td>
</tr>
<tr>
<td>ALT+DOWN ARROW</td>
<td>Opens a drop-down list box</td>
</tr>
<tr>
<td>ALT+TAB</td>
<td>Switch to another running program (hold down the ALT key and then press</td>
</tr>
<tr>
<td></td>
<td>the TAB key to view the task-switching window)</td>
</tr>
<tr>
<td>SHIFT</td>
<td>Press and hold down the SHIFT key while you insert a CD-ROM to bypass</td>
</tr>
<tr>
<td></td>
<td>the automatic-run feature</td>
</tr>
<tr>
<td>ALT+SPACE</td>
<td>Displays the main window's <strong>System</strong> menu (from the <strong>System</strong> menu, you</td>
</tr>
<tr>
<td></td>
<td>can restore, move, resize, minimize, maximize, or close the window)</td>
</tr>
<tr>
<td>ALT+- (ALT+hyphen)</td>
<td>Displays the Multiple Document Interface (MDI) child window's <strong>System</strong></td>
</tr>
<tr>
<td></td>
<td>menu (from the MDI child window's <strong>System</strong> menu, you can restore, move,</td>
</tr>
<tr>
<td>ALT+TAB</td>
<td>resize, minimize, maximize, or close the child window)</td>
</tr>
<tr>
<td></td>
<td>Switch to the next child window of a Multiple Document Interface (MDI)</td>
</tr>
<tr>
<td></td>
<td>program</td>
</tr>
<tr>
<td>ALT+underlined letter in menu:</td>
<td>Opens the menu</td>
</tr>
<tr>
<td>ALT+F4</td>
<td>Closes the current window</td>
</tr>
<tr>
<td>CTRL+F4</td>
<td>Closes the current Multiple Document Interface (MDI) window</td>
</tr>
<tr>
<td>ALT+F6</td>
<td>Switch between multiple windows in the same program (for example, when</td>
</tr>
<tr>
<td></td>
<td>the Notepad <strong>Find</strong> dialog box is displayed, ALT+F6 switches between the **</td>
</tr>
<tr>
<td></td>
<td>Find** dialog box and the main Notepad window)</td>
</tr>
</tbody>
</table>

## General folder/shortcut control

<table>
<thead>
<tr>
<th>Key Sequence</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F4</td>
<td>Selects the <strong>Go To A Different Folder</strong> box and moves down the entries in</td>
</tr>
<tr>
<td></td>
<td>the box (if the toolbar is active in Windows Explorer)</td>
</tr>
<tr>
<td>F5</td>
<td>Refreshes the current window</td>
</tr>
<tr>
<td>F6</td>
<td>Moves among panes in Windows Explorer</td>
</tr>
<tr>
<td>CTRL+G</td>
<td>Opens the Go To Folder tool (in Windows 95 Windows Explorer only)</td>
</tr>
<tr>
<td>CTRL+Z</td>
<td>Undo the last command</td>
</tr>
<tr>
<td>CTRL+A</td>
<td>Select all the items in the current window</td>
</tr>
<tr>
<td>BACKSPACE</td>
<td>Switch to the parent folder</td>
</tr>
</tbody>
</table>
### Windows Explorer tree control

<table>
<thead>
<tr>
<th>Key</th>
<th>Action Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numeric Keypad *</td>
<td>Expands everything under the current selection</td>
</tr>
<tr>
<td>Numeric Keypad +</td>
<td>Expands the current selection</td>
</tr>
<tr>
<td>Numeric Keypad -</td>
<td>Collapses the current selection.</td>
</tr>
<tr>
<td>RIGHT ARROW</td>
<td>Expands the current selection if it is not expanded, otherwise goes to the first child</td>
</tr>
<tr>
<td>LEFT ARROW</td>
<td>Collapses the current selection if it is expanded, otherwise goes to the parent</td>
</tr>
</tbody>
</table>

### Microsoft Natural Keyboard keys

<table>
<thead>
<tr>
<th>Key</th>
<th>Action Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows Logo</td>
<td><strong>Start</strong> menu</td>
</tr>
<tr>
<td>Windows Logo+R</td>
<td><strong>Run</strong> dialog box</td>
</tr>
<tr>
<td>Windows Logo+M</td>
<td>Minimize all</td>
</tr>
<tr>
<td>SHIFT+Windows Logo+M</td>
<td>Undo minimize all</td>
</tr>
<tr>
<td>Windows Logo+F1</td>
<td>Help</td>
</tr>
<tr>
<td>Windows Logo+E</td>
<td>Windows Explorer</td>
</tr>
<tr>
<td>Windows Logo+F</td>
<td>Find files or folders</td>
</tr>
<tr>
<td>Windows Logo+D</td>
<td>Minimizes all open windows and displays the desktop</td>
</tr>
<tr>
<td>CTRL+Windows Logo+F</td>
<td>Find computer</td>
</tr>
<tr>
<td>CTRL+Windows Logo+TAB</td>
<td>Moves focus from Start, to the Quick Launch toolbar, to the system tray (use RIGHT ARROW or LEFT ARROW to move focus to items on the Quick Launch toolbar and the system tray)</td>
</tr>
<tr>
<td>Windows Logo+TAB</td>
<td>Cycle through taskbar buttons</td>
</tr>
<tr>
<td>Windows Logo+Break</td>
<td><strong>System Properties</strong> dialog box</td>
</tr>
<tr>
<td>Application key</td>
<td>Displays a shortcut menu for the selected item</td>
</tr>
</tbody>
</table>