**Keyboard and Web Accessibility**

**The Base**

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| **Interaction** | **Keystroke** | **Notes** |
| Navigate to most Elements or Components | * **Tab** * **Shift** + **Tab** | * Keyboard focus indicators must be present * Navigation order should be logical and intuitive. (should follow language direction ie left to right and top to bottom). |
| Link | **Enter** |  |
| Button | * **Enter** or * **Spacebar** | Ensure elements with ARIA role - “button” can be activated with both key commands. |
| Checkbox / Switch | **Spacebar** | Check or uncheck a checkbox. Used when one or more options can be selected. |
| Radio Buttons | * **↑/↓** or **←/→** - Select an option * **Tab** – Move to next element | Radios should only be used when only one option from a group can be selected. |
| Select (dropdown) menu | * **↑/↓** - Navigate between menu items * **Spacebar** - Expand | You can also filter by typing in letters, but this depends on browser. Some will filter as you type while others will filter by first letter only. |
| Autocomplete | * Type to begin filtering * **↑/↓** - Navigate to an option * **Enter** – Select an option |  |
| Dialog | Esc – Close | * Modal dialogs should maintain focus. * Non-modal dialogs should close automatically when they lose focus. * When a dialog closes, focus should be returned to the element that opened the dialog. |
| Slider | * **↑/↓** or **←/→** - Increase or decrease slider value * **Home** / **End** – Beginning or end | * For double slider (to set a range), **Tab** / **Shift Tab** should toggle between each end * On some sliders **PageUp** / **PageDown** can move by larger increments. |
| Menu bar | * **↑/↓** - Previous/next menu option * **Enter** – Expand the menu (optional) and select an option * **←/→** - Expand / collapse submenu |  |
| Tab panel | * **Tab** – Once to navigate into the group of the tabs and once to navigate out the group of tabs * **←/→** - Previous / next tab | * This is for 'application' tabs that change without loading a new page. If a menu looks like a group of tabs, but is actually a group of links to different pages, Tab and Enter are more appropriate. * The tab content should update automatically when pressing the arrow keys. You should not hit Enter to activate the tab. * Need to find out how to enter the focused tab |
| ‘Tree’ menu | * **↑/↓** - Navigate previous / next menu option * **←/→** - Expand / collapse submenu, move up / down one level |  |
| Scroll | * **↑/↓** - Scroll vertically * **←/→** - Scroll horizontally * **Spacebar / Shift** + **Spacebar** - Scroll by page | Minimize horizontal scrolling. |

**Grid**

Please take note that our gid is a hybrid between the aria standards for TreeGrid and Grid. As such some of the recommendations are blended.

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| **Keystroke** | **Notes** | **Status** |
| **→**  **Right Arrow** | Moves focus one cell to the right. If focus is on the right-most cell in the row, focus does not move. |  |
| **←**  **Left Arrow** | Moves focus one cell to the left. If focus is on the left-most cell in the row, focus does not move. |  |
| **↓**  **Down Arrow** | Moves focus one cell down. If focus is on the bottom cell in the column, focus  does not move. |  |
| **↑**  **Up Arrow** | Moves focus one cell Up. If focus is on the top cell in the column, focus does  not move. |  |
| **PageDown** | Moves focus down an author-determined number of rows, typically scrolling so the bottom row in the currently visible set of rows becomes one of the first visible rows. If focus is in the last row of the grid, focus does not move. |  |
| **PageUp** | Moves focus up an author-determined number of rows, typically scrolling so the top row in the currently visible set of rows becomes one of the last visible rows. If focus is in the first row of the grid, focus does not move. |  |
| **Home** | Moves focus to the first cell in the row that contains focus. |  |
| **End** | Moves focus to the last cell in the row that contains focus. |  |
| **Ctrl + Home** | Moves focus to the first cell in the first row. |  |
| **Ctrl + End** | Moves focus to the last cell in the last row. |  |
| **Ctrl + Space** | selects the column that contains the focus. |  |
| **Shift + Space** | Selects the row that contains the focus. If the grid includes a column with checkboxes for selecting rows, this key can serve as a shortcut for checking the box when focus is not on the checkbox. |  |
| **Ctrl + A** | Selects all cells. |  |
| **Shift +**  **Right Arrow** | Extends selection one cell to the right. |  |
| **Shift +**  **Left Arrow** | Extends selection one cell to the left. |  |
| **Shift +**  **Down Arrow** | Extends selection one cell to the down. |  |
| **Shift +**  **Up Arrow** | Extends selection one cell to the up. |  |

**Note**

* When the above grid navigation keys move focus, whether the focus is set on an element inside the cell or the grid cell depends on cell content.
* While navigation keys, such as arrow keys, are moving focus from cell to cell, they are not available to do something like operate a combobox or move an editing caret inside of a cell.
* If navigation functions can dynamically add more rows or columns to the DOM, key events that move focus to the beginning or end of the grid, such as control + End, may move focus to the last row in the DOM rather than the last available row in the back-end data.

**Tree Grid**

https://www.w3.org/TR/wai-aria-practices/#treegrid

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| **Keystroke** | **Notes** | **Status** |
| **Tab** | If the row containing focus contains focusable elements (e.g., inputs, button, links, etc.), moves focus to the next input in the row. If focus is on the last focusable element in the row, moves focus out of the treegrid widget to the next focusable element. |  |
| **Enter** | If cell-only focus is enabled and focus is on the first cell with the aria-expanded property, opens or closes the child rows. Otherwise, performs the default action for the cell |  |
| **→**  **Right Arrow** | * If focus is on a collapsed row, expands the row. * If focus is on an expanded row or is on a row that does not have children rows, moves focus to the first cell in the row. * Moves focus one cell to the right. * If focus is on the right-most cell in the row, focus does not move. |  |
| **←**  **Left Arrow** | * If focus is on an expanded row, collapses the row. * If focus is on a collapsed row or on a row that does not have child rows, focus does not move. * If focus is on the first cell in a row and row focus is supported, moves focus to the row. * If focus is on the first cell in a row and row focus is not supported, focus does not move. * If focus is on any other cell, moves focus one cell to the left. |  |
| **↓**  **Down Arrow** | * If focus is on a row, moves focus one row down. If focus is on the last row, focus does not move. * If focus is on a cell, moves focus one cell down. If focus is on the bottom cell in the column, focus does not move. |  |
| **↑**  **Up Arrow** | * If focus is on a row, moves focus one row up. If focus is on the first row, focus does not move. * If focus is on a cell, moves focus one cell up. If focus is on the top cell in the column, focus does not move. |  |
| **PageDown** | * If focus is on a row, moves focus down an author-determined number of rows, typically scrolling so the bottom row in the currently visible set of rows becomes one of the first visible rows. If focus is in the last row, focus does not move. * If focus is on a cell, moves focus down an author-determined number of cells, typically scrolling so the bottom row in the currently visible set of rows becomes one of the first visible rows. If focus is in the last row, focus does not move. |  |
| **PageUp** | * If focus is on a row, moves focus up an author-determined number of rows, typically scrolling so the top row in the currently visible set of rows becomes one of the last visible rows. If focus is in the first row, focus does not move. * If focus is on a cell, moves focus up an author-determined number of cells, typically scrolling so the top row in the currently visible set of rows becomes one of the last visible rows. If focus is in the first row, focus does not move. |  |
| **Home** | * If focus is on a row, moves focus to the first row. If focus is in the first row, focus does not move. * If focus is on a cell, moves focus to the first cell in the row. If focus is in the first cell of the row, focus does not move. |  |
| **End** | * If focus is on a row, moves focus to the last row. If focus is in the last row, focus does not move. * If focus is on a cell, moves focus to the last cell in the row. If focus is in the last cell of the row, focus does not move |  |
| **Ctrl + Home** | * If focus is on a row, moves focus to the first row. If focus is in the first row, focus does not move. * If focus is on a cell, moves focus to the first cell in the column. If focus is in the first row, focus does not move. |  |
| **Ctrl + End** | * If focus is on a row, moves focus to the last row. If focus is in the last row, focus does not move. * If focus is on a cell, moves focus to the last cell in the column. If focus is in the last row, focus does not move. |  |

**If a treegrid supports selection of cells, rows, or columns, the following keys are commonly used for these functions.**

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| **Shift + Space** | * If focus is on a row, selects the row. * If focus is on a cell, selects the row that contains the focus. If the treegrid includes a column with checkboxes for selecting rows, this key can serve as a shortcut for checking the box when focus is not on the checkbox. |  |
| **Ctrl + A** | * Selects all cells. |  |
| **Shift +**  **Right Arrow** | * If focus is on a row, does not change selection. * if focus is on a cell, extends selection one cell to the right |  |
| **Shift +**  **Left Arrow** | * If focus is on a row, does not change selection. * if focus is on a cell, extends selection one cell to the left. |  |
| **Shift +**  **Down Arrow** | * If focus is on a row, extends selection to all the cells in the next row. * If focus is on a cell, extends selection one cell down. |  |
| **Shift +**  **Up Arrow** | * If focus is on a row, extends selection to all the cells in the previous row. * If focus is on a cell, extends selection one cell up. |  |

**Tree View**

<https://www.w3.org/TR/wai-aria-practices/#TreeView>

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| **Keystroke** | **Notes** | **Status** |
| **Enter** | Activates a node, i.e., performs its default action. Open the edit dialog for the node. |  |
| **→**  **Right Arrow** | * When focus is on a closed node, opens the node; focus does not move. * When focus is on a open node, moves focus to the first child node. * When focus is on an end node, does nothing. |  |
| **←**  **Left Arrow** | * When focus is on an open node, closes the node. * When focus is on a child node that is also either an end node or a closed node, moves focus to its parent node. * When focus is on a root node that is also either an end node or a closed node, does nothing. |  |
| **↓**  **Down Arrow** | Moves focus to the next node that is focusable without opening or closing a node. |  |
| **↑**  **Up Arrow** | Moves focus to the previous node that is focusable without opening or closing a node. |  |
| **Home** | Moves focus to the first node in the tree without opening or closing a node. |  |
| **End** | Moves focus to the last node in the tree that is focusable without opening a node. |  |
| **\*** | Expands all siblings that are at the same level as the current node. |  |
| **Type Ahead** | * Type a character: focus moves to the next node with a name that starts with the typed character. * Type multiple characters in rapid succession: focus moves to the next node with a name that starts with the string of characters typed. |  |

**Selection in multi-select trees:** Authors may implement either of two interaction models to support multiple selection: a recommended model that does not require the user to hold a modifier key, such as Shift or Control, while navigating the list or an alternative model that does require modifier keys to be held while navigating in order to avoid losing selection states.

**Recommended selection model -- holding a modifier key while moving focus is not necessary**

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| **Keystroke** | **Notes** | **Status** |
| **Space** | Toggles the selection state of the focused node. |  |
| **Shift + Down Arrow (Optional)** | Moves focus to and toggles the selection state of the next node. |  |
| **Shift + Up Arrow (Optional)** | Moves focus to and toggles the selection state of the previous node. |  |
| **Shift + Space (Optional)** | Selects contiguous nodes from the most recently selected node to the current node. |  |
| **Control + Shift + Home (Optional)** | Selects the node with focus and all nodes up to the first node. Optionally, moves focus to the first node. |  |
| **Control + Shift + End (Optional)** | Selects the node with focus and all nodes down to the last node. Optionally, moves focus to the last node. |  |
| **Control + A (Optional)** | Selects all nodes in the tree. Optionally, if all nodes are selected, it can also unselect all nodes. |  |
| **\*** | Expands all siblings that are at the same level as the current node. |  |
| **Type Ahead** | * Type a character: focus moves to the next node with a name that starts with the typed character. * Type multiple characters in rapid succession: focus moves to the next node with a name that starts with the string of characters typed. |  |

**Dialog**

**NOTE**

1. When a dialog opens, focus placement depends on the nature and size of the content.
   * In all circumstances, focus moves to an element contained in the dialog.
   * Unless a condition where doing otherwise is advisable, focus is initially set on the first focusable element.
   * If content is large enough that focusing the first interactive element could cause the beginning of content to scroll out of view, it is advisable to add tabindex=-1 to a static element at the top of the dialog, such as the dialog title or first paragraph, and initially focus that element.
   * If a dialog contains the final step in a process that is not easily reversible, such as deleting data or completing a financial transaction, it may be advisable to set focus on the least destructive action, especially if undoing the action is difficult or impossible.
   * If a dialog is limited to interactions that either provide additional information or continue processing, it may be advisable to set focus to the element that is likely to be most frequently used, such as an OK or Continue button.
2. When a dialog closes, focus returns to the element that invoked the dialog unless either:
   * The invoking element no longer exists. Then, focus is set on another element that provides logical work flow.
   * The work flow design includes the following conditions that can occasionally make focusing a different element a more logical choice:
     1. It is very unlikely users need to immediately re-invoke the dialog.
     2. The task completed in the dialog is directly related to a subsequent step in the work flow.

For example, a grid has an associated toolbar with a button for adding rows. the Add Rows button opens a dialog that prompts for the number of rows. After the dialog closes, focus is placed in the first cell of the first new row.

1. It is strongly recommended that the tab sequence of all dialogs include a visible element with role button that closes the dialog, such as a close icon or cancel button.

**Splitters**

<https://www.w3.org/TR/wai-aria-practices/#windowsplitter>

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| **Keystroke** | **Notes** | **Status** |
| **Left Arrow** | Moves a vertical splitter to the left. |  |
| **Right Arrow** | Moves a vertical splitter to the right. |  |
| **Up Arrow** | Moves a horizontal splitter up. |  |
| **Down Arrow** | Moves a horizontal splitter down. |  |
| **Enter** | If the primary pane is not collapsed, collapses the pane. If the pane is collapsed, restores the splitter to its previous position. |  |
| **Home**  **(optional)** | Moves splitter to the position that gives the primary pane its smallest allowed size. This may completely collapse the primary pane. |  |
| **End**  **(Optional)** | Moves splitter to the position that gives the primary pane its largest allowed size. This may completely collapse the secondary pane. |  |
| **F6** | Cycle through window panes. |  |

**NOTE**

A fixed size splitter omits implementation of the arrow keys.

**Custom Shortcuts**

Need to set up a brainstorm session on this.

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| **Keystroke** | **Notes** | **Status** |
|  | Open up the Main Menu |  |
|  | Open up Properties Panel |  |
|  | Open up Helper Panel |  |
|  | View element (opens when an element in the grid or tree is selected) |  |
|  | Element details (opens when an element in the grid or tree is selected) |  |
|  | New element |  |
|  | Refresh component |  |
|  | Delete element |  |
|  | Query builder |  |
|  | Search / Filter |  |
|  | Close the dialog. The focus should then be on the element that activated the dialog. |  |
|  | Saves the changes to the resource. |  |
|  | Show the lookup. |  |
|  | Show the peek. |  |