

Screen Reader Comparisons

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Contents

Screen Reader Comparisons	1
VoiceOver	2
Turning VoiceOver On and Off	2
Basic Gestures.....	2
NVDA	4
Advantages to Using NVDA.....	4
Installing NVDA	4
Loading And Unloading NVDA	4
NVDA Cursors.....	4
Browsing the Web with NVDA	7
TalkBack.....	8
Toggle TalkBack On and Off	8
Tutorial.....	8
JAWS	9
Turn JAWS Off	9
Turn JAWS Back On.....	9
Reading and Selecting Text	10
Quick Keys	10
Other Commands.....	10

VoiceOver

Voiceover is a screen reader designed to work with various products designed by Apple. Some of these products include the iPhone, iPad, Apple TV and the Mac Book. Each of these devices has different ways of working with Voiceover, as well as different gestures. Even the iPad, which has gestures that are in large part similar to gestures which can be performed on an iPhone, has additional gestures that cannot be performed on the iPhone due to the differences in screen size. This document covers the use of Voiceover on the iPhone. All available gestures are not included in the list provided below, just the most commonly-used gestures.

Turning VoiceOver On and Off

There are a couple options to turn VoiceOver on or off:

1. Ask Siri to turn VoiceOver on or off. You can do that by holding down your home button if you are using an iPhone SE, or any iPhone that is an iPhone 8 or older. If you are using an iPhone 10 or newer, you will need to hold down the power button for Siri to be listening.
2. Press either the power button three times rapidly, or the home button three times rapidly to turn VoiceOver on/off. Again, this is dependent on the model of the iPhone that you currently have. If you have an iPhone 8 or older, or if you have an iPhone SE, you will need to press the home button three times rapidly to turn VoiceOver on or off, and if you have an iPhone 10 or later, you will need to press the power button three times to turn VoiceOver on or off. Note: to turn on VoiceOver using your home or power button, you will need to make sure that the accessibility shortcut is set to VoiceOver. The accessibility shortcut can be found in settings>accessibility>accessibility shortcut near the bottom of the accessibility screen in the settings app.

Basic Gestures

1. One-finger gestures
 - a. One finger swipe right: move to next item.
 - b. One finger swipe left: move to previous item.
 - c. One finger swipe down: moves forward by the currently selected rotor item. Rotor items can include characters, words, headings, actions and more.

- d. One-finger swipe up: moves backward by currently selected rotor item.
 - e. One-finger double-tap: activates an item.
 - f. One-finger triple-tap: Brings up a menu of quick actions.
2. Two-finger gestures
- a. Two-finger single-tap: pauses VoiceOver from speaking.
 - b. Two-finger double-tap: magic tap. Can be used to play/pause music, answer/hang up phone calls or start/stop dictation.
 - c. Two-finger triple-tap: opens the item chooser. This is a way of seeing the different items that are available on the screen, search for items and also seeing where their location is on the screen.
 - d. Two-finger quadruple tap: opens a quick settings screen for VoiceOver.
 - e. Two-finger swipe up: will read from the very top of the screen to the very bottom of the screen.
 - f. Two-finger swipe down: reads from where your cursor currently is to the bottom of the screen.
 - g. Two-finger scrub quickly to the left and then right: goes back to the previous screen.
3. Three-finger gestures
- a. Three-finger single tap: speaks information about the current item on the screen, as well as its position on the screen.
 - b. Three-finger double-tap: mutes and unmutes speech while keeping VoiceOver turned on.
 - c. Three-finger triple-tap: turns screen curtain on/off.
 - d. Three-finger quadruple-tap: copies the last thing that VoiceOver spoke.
 - e. Three-finger swipe left: scroll left one page.
 - f. Three-finger swipe right: swipe right one page.
 - g. Three finger swipe down: scroll up one page.
 - h. Three-finger swipe up: scroll down one page.

NVDA

NVDA is a free, open-source screen reader developed by NV Access. This screen reader has many features that are available in other screen readers such as JAWS and Narrator, including braille support for all of the major supported displays, keyboard commands to accomplish many everyday tasks, web browsing capabilities, and much more. In addition, NVDA is unique in the sense that it has add-ons to further enhance the screen reader and to make it work better with different applications. These add-ons are constantly being maintained by NVDA's devoted community of developers.

Advantages to Using NVDA

- auto-detection of most braille displays
- ability to run it from a USB flash drive to perform quick tasks without needing to install it
- translated into many different languages

Installing NVDA

To download NVDA, go to nvaccess.org and select the download option. You can then locate and run the installer in your downloads directory. If you are interested in installing add-ons, please see the handout on NVDA add-ons.

Loading And Unloading NVDA

After installing NVDA, if it does not start automatically, you can start it by doing one of the following:

1. Press control+alt+N. You should hear a series of ascending piano notes and then NVDA will start speaking.
2. Click on the NVDA icon on your desktop.

To unload NVDA, do the following:

1. Press insert+Q. NVDA will give you options on what you want to do. You can arrow down through those options and press enter on the option you want.
2. Bring up the NVDA menu by pressing insert+N, and then arrow down to the exit option.

NVDA Cursors

1. System Focus

- a. Used for standard navigation commands such as tabbing, shift tabbing and arrow keys. Also used for text input.
- b. Uses most shortcuts that are used in screen readers such as JAWS.
 - i. NVDA+tab: reads the currently focused control.
 - ii. Insert+T: reads the title of the current window. Press twice to spell out the title, and press three times to copy the title to the clipboard.
 - iii. NVDA+shift+end: reports the status bar if NVDA finds one. If you press it twice, it will spell out the information, and if you press it three times it will copy the information to the clipboard.

2. Object navigation

- a. Useful if we want to explore different objects without using the system caret cursor.
- b. Useful for accessing information within objects that would not be accessible using conventional keyboard commands.
- c. Objects are organized hierarchically, which means that some objects contain other objects, and you have to move inside of an object to access the specific information inside of it. The current object being reviewed is referred to as the navigator object.
 - i. Example: a list contains list items. So, you must move inside of the list to read the list items.
 - ii. A toolbar contains controls, so you have to move into that toolbar to access the controls.
- d. Object cursor shortcuts
 - i. Insert+numpad 5: report current object. Pressing it twice will spell it out, pressing it three times will copy the information to the clipboard.
 - ii. Insert+numpad 8: moves to the object containing the navigator object.
 - iii. Insert+numpad 4: moves to the object that is before the navigator object.

- iv. Insert+numpad 6: moves to the object after the navigator object.
- v. Insert+numpad 2: moves to the containing object of the navigator object, if the navigator object has any objects inside of it.
- vi. Insert+numpad -: moves you to the object where your system focus currently is.
- vii. Insert+numpad enter: activates the current object. Particularly useful if there is an object that is not being read, and you want to find a button because your system focus is not finding it.

3. Screen review

- a. Allows you to read the current text on the screen, in an object or a document by character, word, or line.
- b. Most useful in areas of windows like the windows console where there is no system caret, or if you want to review a long block of text in a dialogue box.
- c. When moving with the review cursor, the system caret does not follow along, but when moving with the system caret, by default, the review cursor does follow along.
- d. Screen review shortcuts
 - i. 7: moves to the top line of the text being reviewed.
 - ii. Shift+numpad 9: moves the review cursor to the bottom line of text.
 - iii. Shift+numpad 1: moves to the beginning of the line of text being reviewed.
 - iv. Shift+3: moves to the end of the line of text being reviewed.
 - v. You can use the following commands to navigate by lines. Numpad 7: Move to previous line of text., numpad 8: reads the current line being reviewed, numpad 9: moves the review cursor to the next line of text.
 - vi. You can use these commands when moving by words in review mode. Numpad 4: moves to previous word in

review mode, numpad5: reads the current word you are focused on in review mode, numpad 6: moves to the next word in review mode.

- vii. You can use the following lines to move by character in review mode. Numpad 1: moves to the previous character in review mode, numpad 2: reports the current character in review mode, numpad 3: moves to the next character in review mode.
- viii. Move to the previous page in review mode: Insert+page up.
- ix. Move to next page in review mode: Insert+page down.
- x. Numpad plus: say-all in review mode, which will read everything in the object.

4. Switching between review modes

- a. Insert+numpad 7: switch to next review mode.
- b. Insert+numpad 1: switch to previous review mode.

Browsing the Web with NVDA

Browsing the web using the NVDA screen reader is almost the same as doing it with JAWS. Many of the web browsing commands are the same, but NVDA has some commands that JAWS does not have. In addition, NVDA's brows mode works almost the same as something like virtual mode which people might be familiar with if they have had experience with browsing the web using JAWS. Below are some of the most commonly used web browsing shortcuts that are available when browsing the web using NVDA. There is a more comprehensive list of shortcuts in the NVDA user guide.

1. Navigation shortcuts

- a. H and shift+H: move you to the next and previous heading respectively.
- b. K and shift+K: move you to the next or previous link respectively. (JAWS does not have this feature)
- c. U and shift+U: move you to the next or previous unvisited link.
- d. V and shift+V: move you to the next or previous visited link.
- e. F and shift+F: move you to the next or previous form field.

- f. T and shift+T: move you to the next or previous table.
- g. Insert F7: brings up the element list.

TalkBack

TalkBack is a screen reader app for Android-based systems. The synthesized speech allows the user to navigate through the device and make selections. You can read text, articles, notifications, send messages and more.

TalkBack's gestures mostly use one finger and occasionally two fingers.

To activate TalkBack, go to settings on your device and locate and tap Accessibility, Vision, TalkBack, select the option for TalkBack shortcut and then exit.

Toggle TalkBack On and Off

- a. Press and hold the up and down volume keys for more than 3 seconds.

Going through device settings to locate the tutorial and demonstrate:

- a. Locate and tap the device's settings app, Accessibility, Vision, TalkBack, Settings, Tutorial and Help.
- b. Turn on TalkBack by pressing and holding the up and down arrow keys for more than 3 seconds.
- c. Swipe your finger from left to right until you hear Tutorial, and then double tap anywhere on the screen to open and begin the tutorial.
- d. Swipe from left to right to locate Basics navigation and double tap on the screen to open.

Tutorial

- 1. The Basics
 - a. Scroll through a page
 - b. System actions
 - c. Menu and controls/TalkBack menu
 - d. Reading controls
- 2. Editing Text
 - a. Activating text boxes
 - b. Moving the cursor throughout the text box
 - c. Select text in a text box
 - d. Cut, copy and paste text

3. Reading Text

- a. By character, word or paragraph
- b. Jump between controls
- c. Jump between links
- d. Jump between headings

JAWS

JAWS, or Job Access With Speech, is a Windows-based screen reader that uses synthesized speech to navigate, read, and control the computer with the use of keyboard shortcut commands. JAWS is considered the industry standard of screen readers.

JAWS is free if you download and run it as a 40-minute demo. However, you must reboot your computer to refresh the 40-minute cycle. The home annual license is \$95 per year and the home license is \$1,100. You can install onto 3 Windows devices for the annual and home licenses. JAWS can be downloaded at freedomscientific.com.

Here are a few reasons people use JAWS specifically:

1. It is considered the industry standard.
2. The user may need to use Zoomtext alongside JAWS. The two software work well together.
3. The user may also have issues using their hands, making the use of JAWS difficult or impossible. JAWS can be used in conjunction with a speech recognition software called Dragon Naturally Speaking. Another program called JSay also has to be installed. The JSay tell the JAWS to respond to the verbal commands that were given through Dragon Naturally Speaking.

Turn JAWS Off

- a. Press and hold Insert and press F4 and then Enter.

Turn JAWS Back On

1. Go to desktop and locate JAWS.
2. Press Applications key/context key or shift F10, arrow to Properties and press Enter.
3. Tab to the edit field for your desired key command. Perform the key command you want for turning JAWS on.

4. Tab to OK, press Enter.

Reading and Selecting Text

- a. Read by letter with left/right arrows or numpad 4 and 6
- b. Read by word with control left/right arrow or control numpad 4 or 6
- c. Read by line with up/down arrow or numpad 8 or 2
- d. Read by paragraph with control up/down arrow or control numpad 8 or 2
- e. Select by letter with shift left/right arrows or shift numpad 4 and 6
- f. Select by word with control shift left/right arrow or control shift numpad 4 or 6
- g. Select by line with shift up/down arrow or shift numpad 8 or 2
- h. Select by paragraph with control shift up/down arrow or control shift numpad 8 or 2
- i. Select to the beginning/end of document with control shift home/end or control shift numpad 7 or 1
- j. Select to the beginning/end of line with shift home/end or shift numpad 7 or 1
- k. Select all text with control A

Quick Keys

Quick Keys is a JAWS-specific feature that allows your keys to navigate through tables, headings, links, and so on while using a Word document. For example, if Quick Keys is on, pressing H will jump between headings instead of typing the letter H inside of the text document.

- a. Press and hold insert and press Z. Think of the word keys with a Z on the end of it
- b. Press T for table or shift T to go backwards, if need be
- c. Press H for headings or shift H to go backward, if needed
- d. Insert F7 for Links List while inside a Word document

Quick keys is a toggle, meaning that it can be turned on and off by using the same key command. Insert Z.

Other Commands

- a. To read the title bar of any opened program, press and hold Insert and press T
- b. Insert tab will make JAWS repeat the previous statement, in case the user has missed what was said
- c. Insert F7 brings up the links list
- d. Insert F6 brings up headings list
- e. Insert F5 (think of forms 5) brings up the forms list

These key commands and more can be found on the Freedom Scientific website at freedomscientific.com.

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