

# Your Survival Guide to Screen Reading Apps

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## Introduction

You know accessibility is more than just another buzzword. It's more than another box to check, thing to do or "gee golly, that would be nice to have" kind of thing.

Accessibility is a fundamental right. Everyone should have the ability to access, consume and engage with resources, information and experiences. Doing so means we include everyone at the table, and our communities are stronger, richer and more diverse, which helps us get a broader perspective of the world around us.

One way to demystify accessibility is to get comfortable with some of the tools used by people with disabilities. Screen reading apps often feel like a black box to developers, designers and content creators - but they don't have to be anymore.

In this guide, you will learn how screen reading apps are used in the blindness community and ways you can quickly and easily use these apps to check the accessibility of your website, app or content.

There are tutorials that take a much deeper dive into the nuts and bolts of screen reader use, but I've written this no-fuss resource to be a QuickStart for the average web professional looking to test and tinker with the accessibility of their creations. You can always contact me if you'd like to go further down the rabbit hole – and I'll happily point you in a useful direction (especially if a cold glass of Big Red is involved.)

## Fundamentals of Screen Reading Use

Screen reading apps parse the source code of an application, website or document and present it in a linear fashion for people who are blind or visually impaired. Developers can also pass information along to a screen reading app through APIs to provide context or additional queues for screen reader users.

There's a common misconception that screen reader users only navigate using the Tab key – and that's just not true. As you'll learn in the following sections, there are robust sets of keyboard commands to view or engage with any part of the screen at any time.

There's literally no way that, as a passive user of screen reading technology, that you'll be as competent or proficient as someone who uses the same app all the time. That's why, in testing, you need to combine automated checks with manual testing of your own – and then give users of these assistive technologies a chance to test and provide feedback.

## Screen Reading Preferences

WebAIM routinely surveys the blindness community to better understand the usage of screen reading technologies across the market. In doing so, they make their data public so developers and content creators can better understand who is using the technology and how they're using it.

Here are some interesting findings from the latest WebAIM survey:

- 65% of screen reader users surveyed are totally blind, with 20% using screen reading apps due to low vision and 2% for a cognitive disability.
- Of those surveyed, 59% say their screen reader usage is at an advanced level, with 34% saying their proficiency level is intermediate.
- 46% of respondents say JAWS for Windows is their primary screen reader. But closing the gap with 31% is Nonvisual Desktop (NVDA.) 11% of respondents say they use VoiceOver.
- Respondents indicate they often use more than one screen reading app.
- 69% of those surveyed say they use VoiceOver on iOS as compared to 29% for Talkback on Android.
- More screen reader users are moving to mobile browsing.
- 40% of respondents say web accessibility has gotten better over time, while 40% say web accessibility has remained unchanged.

The fact is: Screen reader usage is diverse. People who are blind or visually impaired browse the web differently from person to person, situation to situation – just like the mainstream population of tech users. You can't just test with one app, one browser and one device. You must do QA for this community like you would with anything else.

### Essentials: JAWS for Windows

Developer: Freedom Scientific

Website: <https://www.freedomscientific.com/>

JAWS (Job Access with Speech) is widely regarded as the most powerful screen reading solution in the world. With its ability to support access to the Windows operating system, as well as many popular apps like Microsoft Office, Google Docs, Chrome, Firefox and more, JAWS is a leader in digital accessibility in consumer and corporate settings.

The power and productivity of JAWS does come at a hefty price, however. Standard licensing of the product is around the \$1000 mark, and routine updates cost around \$250. Despite these costs, JAWS continues to be the leader in the Windows screen reader market due in large part to rehabilitation agencies and other programs which support people who are blind or visually impaired with educational and vocational needs.

### Testing with JAWS

There are a few options for getting a copy of JAWS for Windows: You can download a trial, which runs in 40-minute mode and will only work again once the computer is restarted, or you can buy a 90-day, home or professional license.

You should decide how long your application, website or content may take to test, and if there will be more than one individual needing to use JAWS for testing. 40-minute mode is often sufficient for testing the average app or website.

Tip: You can install JAWS in a VM environment and simply restart your virtual system to run the screen reader in 40-minute mode again.

## Getting started with JAWS

I recommend you take a few moments to look through the settings in the JAWS Startup Wizard which launches automatically the first time you run JAWS. (You can also get to this Startup Wizard via JAWS > Help > Startup Wizard.) There are many important settings in this dialog, including speech rate, verbosity levels and keyboard layout.

Because most screen reader users aren't working with the mouse for navigation and access, JAWS for Windows primarily uses keyboard commands to perform functions such as announcing specific sections of text, reading controls in dialog boxes or quickly jumping to various page elements like headings or graphics.

TIP: JAWS uses the Insert key for many of its commands. This key is often called a "modifier key." You can change JAWS' modifier key to use the Caps Lock key in the JAWS Startup Wizard (JAWS > Help > Startup Wizard) or in JAWS > Options > Basics.

There are two types of keyboard commands when getting started with JAWS. You can press a modifier key plus a combination of one or more keys to use a command, or you can use single-key navigation (on the web) to quickly jump to various HTML elements (like headings, graphics, lists and form fields.)

## Keyboard Commands

Here are some basic modifier key commands to try as you begin working with JAWS.

Command	Keys	Action
Keyboard Help	Insert + 1	Turns on/off the Keyboard Help mode. When in Keyboard Help mode, you can press different keyboard combinations and JAWS will announce their function.
Settings Center	Insert + 7	Displays the JAWS Settings Center to change various default and application-specific settings.
JAWS Hotkeys	Insert + H	Displays a list of JAWS hotkeys for the current application.
Show JAWS	Insert + J	Shows the JAWS application or opens the JAWS context menu in the system tray.
Increase/Decrease Speech Rate	CTRL + Alt + Windows key + PgUp and Pg Down	Makes speech rate faster or slower respectively.
Links list	Insert + F6	Shows a list of links available on the current webpage.
Headings list	Insert + F7	Show a list of headings available on the current webpage.

## Single-Key Commands on the Web

These commands work in standard web browsers, such as Microsoft Edge, Mozilla Firefox and Google Chrome. The idea is to allow a screen reader user ease of access to common HTML elements.

NOTE: Each single-key command moves to the next instance of that element on the page. You can combine these single-key commands with the Shift key to move to the previous instance of that element.

C o m m a n d	Key	A c t i o n
Radio button	A	Navigate by radio buttons.
Button	B	Navigate by buttons.
Combo box	C	Navigate by combo boxes.
Different element	D	Navigate to the next element of a different type. For example, a link following four paragraphs.
Edit field	E	Navigate by edit fields.
Form field	F	Navigate by form controls.
Graphics	G	Navigate by images.
Headings	H	Navigate by headings.
List item	I	Navigate by list items.
List	L	Navigate by unordered and numbered lists.
Paragraphs	P	Navigate by paragraphs.
Main region	Q	Navigate to the section marked with role=main.
Region / Landmark	R	Navigate by ARIA landmark regions.
Table	T	Navigate by tables.
Heading levels	1-6	Navigates to the heading level representative of the number pressed. Example: Pressing 2 moves between headings at level 2 (or H2.)

## Additional Notes on JAWS

- You can press Insert + Spacebar and then the letter J to show a listing of the last 50 items JAWS announced. If you are curious how a certain element was read out loud, but you're having difficulty understanding JAWS' speech, this command can be helpful by providing a transcript of w h a t w a s a n n o u n c e d .
- JAWS also comes with a Tandem mode, which allows for complete JAWS support for remote connections between computers. With JAWS Tandem, you can conceivably connect with a native JAWS user to do more advanced testing and here the output as they interact with content on your machine. This can be handy for user experience testing with a nonvisual user (which you s h o u l d a b s o l u t e l y b e d o i n g . )

## Essentials: Nonvisual Desktop Access (NVDA) for Windows

Developer: NV Access

Website: <https://www.nvaccess.org/>

Founded on the principle that every person who is blind or visually impaired deserves the right to freely and easily access a computer, NV Access has developed Nonvisual Desktop Access (or NVDA) as a free, open source alternative to the popular JAWS for Windows product.

NVDA has grown in both power and popularity over the past few years, as it is routinely updated to support next-generation apps and technologies. NVDA is also consistently ahead of JAWS in supporting updated versions of Windows, which was the case with versions 8 and 10 of Windows.

Because there is no cost associated with using NVDA, it is an ideal solution for developers, designers and creators to use when testing their content. While NVDA will expose many major accessibility concerns, it is still recommended that JAWS is used to best understand how a majority of screen reader users might experience your solution.

### Testing with NVDA

You can download a free copy of NVDA on the NV Access website. By default, NVDA uses the eSpeak voice synthesizer, which many unfamiliar with screen reading technologies have a difficult time understanding. You can easily switch to the built-in speech engine options installed with Windows in NVDA > Preferences > Synthesizer. There are many free SAPI voices available to use with NVDA, as well.

### Keyboard Commands

Like JAWS for Windows, NVDA uses Insert as its modifier key. This can be changed in NVDA > Preferences > Keyboard Settings.

This is a list of keyboard commands which can be used globally to interact with Windows and read/review content.

Command	Keys	Action
Input Help	Insert + 1	Toggles Input Help Mode on and off. When in Input help Mode, you can press combinations of keys to have NVDA announce their function.
Mouse announcements	Insert + M	NVDA will announce the item beneath your mouse cursor. This is helpful for spot-checking

### Single-Key Commands on the Web

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NOTE: Each single-key command moves to the next instance of that element on the page. You can combine these single-key commands with the Shift key to move to the previous instance of that element.

Element	Key	Action
Button	B	Navigate by buttons.
Combo box	C	Navigate by combo boxes.
ARIA Landmark regions	D	Navigate by ARIA landmark regions.
Edit field	E	Navigate by edit fields.
Form field	F	Navigate by form fields.
Graphics	G	Navigate by images.
Heading	H	Navigate by headings.
List item	I	Navigate by list items in unordered/numbered lists.
Link	K	Navigate by hyperlinked items.
List	L	Navigate by unordered/numbered lists.
Radio button	R	Navigate by radio buttons.
Table	T	Navigate by tables.
Checkbox	X	Navigate by check boxes.

## Essentials: VoiceOver for Mac OS

Developer: Apple, Inc.

Website: <https://www.apple.com/accessibility/mac/vision/>

Apple has developed a reputation for being accessible and inclusive, and their massive suite of accessibility features walk the walk. VoiceOver has been a fixture in Apple's desktop OS since 10.3 (Panther), but was revamped and retooled with a truly useful feature set in 10.6 (Snow Leopard.)

As a built-in option for Mac OS users, VoiceOver offers phenomenal support for stock applications, like Safari, Text Edit, Mail, Preview, Calendars and more. Third-party web browsers, like Mozilla Firefox and Google Chrome, do have support, but have not always had the best track record of full accessibility (though it's been much better of late.)

There has been a shift to the Apple ecosystem in the blindness community since 2010, as Apple's commitment to accessibility and the lack of recurring costs to update the screen reading software is a huge draw for people who are blind or visually impaired.

### Testing with VoiceOver for Mac OS

The beauty of VoiceOver on the Mac? Simply press CMD + F5 to launch the app. You can also launch VoiceOver from System Preferences > Accessibility > VoiceOver.

To modify many of VoiceOver's settings and features, you'll need to launch the VoiceOver Utility by pressing FN + CTRL + Option + F8 while VoiceOver is active. You can also find an option to launch VoiceOver Utility in System Preferences > Accessibility > VoiceOver.

### VoiceOver Quick Start

I highly recommend everyone work through the VoiceOver Quick Start training, which is built-in to the screen reader. Activate VoiceOver with CMD + F5 and then press FN + CTRL + Option + CMD + F8 to launch the Quick Start. (This will also launch automatically the first time you enable VoiceOver.)

This interactive tutorial will walk you through the basics of VoiceOver and its keyboard commands. You even have the chance to test what you've learned, which allows you to have confidence you can do the keyboard commands necessary to test with VoiceOver. As a brand new VoiceOver user in 2009, this was the single-most important step I took when setting up my new Macbook.



## Keyboard Commands

TIP: Like other screen reading options, VoiceOver uses a modifier key for many of its commands. For VoiceOver commands, you will often press CTRL + Option when a command references the “VO key.” There is a command to toggle “VO modifier lock,” which will essentially “hold” these two keys so you don’t have to press them when doing a VoiceOver commands. (I’ll admit, the number of keys necessary for many accessibility commands on the Mac is a gripe of mine.)

VoiceOver’s model of interaction is vastly different than most other screen reading apps. Instead of using the arrow and Tab keys to move through content, VoiceOver requires that you “interact” with an area of the screen to actually work with the content inside of it. The easiest way to explain it is this: Think about how Tupperware stacks inside of itself – from the largest container to the smaller containers inside. VoiceOver views the OS and websites like stackable containers. Your web content is inside of a content area inside of your web browser. You have to interact with each level to drill down to the content you’d like to have read aloud by VoiceOver. This can be confusing to those new to VoiceOver.

To get up and running with VoiceOver, here are a few commands worth noting.

Command	Keys	Action
VoiceOver Help	Vo + K	While in Help mode, you can press single or combinations of keys to hear VoiceOver announce their function when pressed.
Move through items	VO + Any arrow key	Move directionally through the content.
Interact with content	VO + Shift + Down arrow	Interact with an area. Allows you to use content within a given area.
Stop interacting	VO + Shift + Up arrow	Move to a parent area / container. (Example: Move one level up from a toolbar to resume interacting with the main application window.)

## Using the Trackpad Commander

VoiceOver has a nifty feature to help you spot-check for accessibility with your mouse pointer. Trackpad Commander lets you scroll the screen and VoiceOver will announce items beneath your pointer.

To enable Trackpad Commander, simply hold your VO key and take two fingers and “twist” them clockwise on your trackpad (almost as if you were tuning a dial.) You will hear VoiceOver say “Trackpad Commander on.” To turn off the Trackpad Commander, hold your VO keys down again – but this time, twist in the opposite direction. VoiceOver should announce “Trackpad Commander off.”

### Using Quick Nav

I’ll be honest: VoiceOver requires a tremendous amount of finger dexterity, if it isn’t obvious from just glossing over this guide. That’s why I love Quick Nav when browsing the web.

Quick Nav lets you use the Up and Down arrow keys to navigate by element types (such as headings or images.) Instead of pressing a single-letter, you’ll use arrows instead.

To enable Quick Nav, press and hold the Left arrow key and then, without letting go, press the Right arrow key. VoiceOver should say “Quick Nav on.” To disable Quick Nav, just repeat the same keyboard command.

Now, to toggle between element types, you’ll press and hold the Up arrow key and then, without letting go, press the Right arrow key. You’ll hear VoiceOver announce an element type. This is the element you’d use for navigation. You can continue holding Up while pressing Right to cycle through available element types. When you find the one you want, simply press Up or Down to navigate through the page by that element.

### Essentials: VoiceOver for iOS

Developer: Apple, Inc.

Website: <https://www.apple.com/accessibility/iphone/vision/>

The very first built-in screen reading option for mobile devices, VoiceOver is one of the most notable innovations for the blind and visually impaired community in the past 30 years. By making the iPhone, iPad, Apple TV and Watch accessible to those with vision loss, Apple has unlocked limitless access to information, media and possibilities.

VoiceOver works with all of the native iOS applications, like Safari, Mail, Contacts, Calendar, iBooks and more. Even the Camera app provides VoiceOver users with audible voice prompts to inform when a subject is in focus. Many third-party apps are also accessible due to Apple’s powerful accessibility API and the push for inclusion by the company’s leadership.

## Testing with VoiceOver for iOS

It's worth noting first that VoiceOver does change how you interact with your touchscreen. For example, instead of single tapping the item to make your selection, you must single tap the item to focus on it and then double tap to activate it when VoiceOver is enabled. If you have trouble working with VoiceOver at first, you can always ask Siri to disable VoiceOver to resume your normal use.

There are a couple of ways to enable VoiceOver:

- You can always ask Siri to turn on and off VoiceOver.
- You can also visit the Accessibility menu in Settings > General > Accessibility, which has a plethora of options to help all users benefit from the tremendous power of iOS.

It's also important to mention that, when setting up an iOS device for the first time, Apple has thought to allow VoiceOver access by simply tapping the Home button three times. (You can enable this triple-click feature in Settings > General > Accessibility if you find yourself frequently testing with VoiceOver.)

## Using VoiceOver for iOS with Gestures

Because of the iPhone and iPad touchscreen interface, VoiceOver for iOS primarily functions using gestures – or different combinations of finger movements and taps to use its features.

The great part about a touchscreen-based screen reading app is that you can just touch the portion of the screen where you're looking to test. In most instances, this is a good way to quickly and easily test if what you've created is accessible. You'll still want to "flick" around to get the rest of the context, but more on that in a moment.

Command	Gesture	Action
Focus on an item	Single tap	Moves VoiceOver focus to item underneath your finger.
Activate item	Single-finger double tap	Activate the item with VoiceOver focus.
Move between items	Single-finger flick	Similar to using a Tab key to move between items, a single-finger flick left or right moves between items on screen.
Scrolling	Three-finger swipe up, down, left or right	Moves between pages on the Home screen or vertically through content on the web.
Help mode	Four-finger double tap	In Help mode, you can perform gestures on the screen and VoiceOver will tell you what they do.

## Essentials: Talkback for Android

Developer: Google

Website: <https://support.google.com/accessibility/android/answer/6283677?hl=en>

Talkback is a built-in screen reading option for Google Android devices. In 2018, Google rebranded Talkback as part of the Google Accessibility Suite.

Because I have no experience with Android, it's best if I refer you to the pros who know it inside and out. Please browse these links to find more information on the Google Accessibility Suite.

- [Accessibility Overview – Android Developers](#)
- [Inclusive Android](#)

## Closing Thoughts

Don't let screen reading apps scare you! Sure, they have some funky keyboard commands, some of which make your fingers do acrobatics to do them correctly. But to do basic accessibility testing, you've totally got this!

Remember: The key to gauging the accessibility of your website, content or app relies on three processes: Automated testing, manual checks and user testing with people who use assistive technologies each and every day. Become the go to in your office on this stuff – and then find ways to share that awesome knowledge as professional development for those around you.

Also: Don't feel like you have to go it alone either. I'm available to chat any time! Call, email or text – if you're reading this guide, consider me your source when you need accessibility or assistive technology questions answered in a straightforward, no-fuss fashion.

Be bold, be brave, be inclusive.

## References and Resources

[WebAIM Screen Reader User Survey #7 \(October 2017\)](#)