The details are correct at the time of writing and based on iOS 12+ and Android 4.4+. Note that new releases on both platforms may mean the details change or are adjusted slightly. Additionally, Android features can be inconsistent across devices and versions. The document flags issues where known, however, there may be further issues.
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Android accessibility features can be enabled on Android devices through **Settings → Accessibility**.

**TalkBack**
Pre-installed Android screen reader. When enabled, Android reads everything on the screen. In apps, this includes all buttons, images, form elements, static text, etc. In the mobile browser, this should include all web content (text, alternatives for images, links, form fields, tables, and so on). TalkBack users include blind and low-vision users, as well as users with some cognitive or learning difficulties.

**Switch access**
Switch access allows you to control your device using configurable key combinations with an external keyboard. You can move focus to clickable items and select an item.

**Magnification gestures**
When enabled, magnification allows you to zoom in and out by triple-tapping the screen.

**Grayscale view**
When enabled, this setting removes all color from the display, which can make it easier for users with vision disabilities, such as color-blindness, to read the display.
**TALKBACK**

To enable TalkBack, navigate to **Settings → Accessibility → TalkBack** then switch the button to **On**. A ‘Use TalkBack’ confirmation screen will appear. When used for the first time a tutorial will be launched. Ensure the device volume is turned up as TalkBack doesn’t automatically adjust the volume if muted.

You can customize the TalkBack experience through **Settings → Accessibility → TalkBack → Settings**. Mid-way down the settings screen under the heading “Touch Exploration” ensure that “Explore by touch” is selected, and then launch and complete the “Explore by touch” tutorial. It is recommended you follow the Talkback tutorial accessed mid-way down the settings screen under the heading “Touch Exploration”.

**Switching Talkback on and off quickly**

You can map the TalkBack on/off button to the Power key by navigating to **Settings → Accessibility → Accessibility shortcut** and selecting **On**. Then you can then switch TalkBack on and off using these two steps:

1. **Press and hold** the Power button until you hear a sound or feel a vibration.

2. **Touch and hold two fingers** on the screen until you hear spoken confirmation.

If the device has multiple users, using the shortcut on the lock screen temporarily enables accessibility features until the device is unlocked.

**Note:** This feature is not universal across devices. For example it does not appear to work on the Hudl running KitKat 4.4.2.
Basic gestures on Android

Once you enable TalkBack, the way you interact with the device changes.

There are two interaction methods:

- **Explore by touch**: Drag your finger over the screen to have TalkBack describe the items under your finger. You can double tap to open links, press buttons, and so on. When you switch TalkBack on, touch exploration is automatically enabled.

- **Gesture navigation**: You can swipe right with a single finger to move from one item to the next in sequence. Or you can swipe left to go backward through this sequence. TalkBack describes items as you move focus around the screen. You can double-tap to open links, press buttons, and so on.

In some applications, you can zoom by putting two fingers on the screen and pinching them together or pulling them apart. The chart below shows Android’s core touch and gesture commands.
Core TalkBack commands
Switch TalkBack on/off

Press and hold the off button, wait for the vibration then hold two fingers down.

Or through Settings → Accessibility → TalkBack

Note: This only works if the Accessibility Shortcut has been enabled in the accessibility settings screen

Speak an element
- Single tap

Scroll
- Two-finger slide

Select next item
- Swipe right / down

Select previous item
- Swipe left / up

Scroll forward
- Right then left
  *If you're on a page longer than one screen*

Move to first item on screen
- Up then down

Move to last item on screen
- Down then up

Scroll back
- Left then right
  *If you're on a page longer than one screen*
Move slider down

Left then right

*Such as volume*

Home button

Up then left

Back button

Down then left

Recent apps

Left then up

Notifications

Right then down

Open local context menu

Up then right

Open global context menu

Down then right

Zoom

One-finger triple tap

*Built in screen magnification, when enabled*

This isn’t considered necessary for testing, but you can assign new actions to the gestures through

**Settings ➔ Accessibility ➔ TalkBack ➔ Settings ➔ Manage gestures.**
**Context menus**

TalkBack has a global context menu and a local context menu to make it easy to find settings and controls. The global context menu contains commands that work anywhere, and the local context menu varies depending on the focused item. On older versions, the global and local context menus are shaped like circles, so you can drag your finger in a circle to hear the different options. On Android 5+ they are presented as lists.

**TalkBack global context menu features**

The following explains features available in the global context menu.

**Quick navigation**

Hear all of the items on the screen as you move your finger in a circle. This option isn’t available if you’re using the list version of the context menu instead of the circle version (by enabling “Show Context Menu as list” in TalkBack settings).

**Read from top**

Hear a read-out of all items on the screen, starting from the top.

**Read last utterance**

Hear the last verbalization again.

**Spell last utterance**

Hear a letter-by-letter spelling of TalkBack’s last verbalization.

**Read from next item**

Hear a read-out of all items on the screen, starting from the last focused item.

**TalkBack settings**

This option is outside the circle menu, at the top-right corner of your screen. Selecting this option opens the TalkBack settings screen.

**Using the global context menu**

- **Swipe down then right to open the menu**
- **Drag your finger to hear menu items.**
- **When you hear the item that you’d like to select, release your finger.**

**Text to speech settings**

This option is outside the circle menu, at the bottom-right corner of your screen. Selecting this option opens your text-to-speech settings. You can disable TalkBack or dim the screen from here.
Local context menu

The local context menu contains controls that relate to the focused item. The options available in the menu change depending on the item. If there are no relevant options, TalkBack announces 'No menu items'.

TalkBack local context menu features

The following explains features available in the local context menu.

**Default**

Each swipe to the right reads the content of the focused item.

**Characters**

Each swipe to the right speaks one character of the currently focused item.

**Words**

Each swipe to the right speaks one word of the currently focused item.

**Lines**

Each swipe to the right speaks a single line of the currently focused item.

**Paragraph**

Each swipe to the right speaks one paragraph of the currently focused item.

**Page**

Each swipe to the right speaks all of the items on the current page.

Using the local context menu

- **Swipe up then right** to open the local context menu.
- **Drag your finger in a circle** to hear menu items.
- **When you hear the item** that you’d like to select, release your finger.

Alternative TalkBack local context menu features

When you activate the local context menu from screens other than your home screen, you might hear the features in the following table.

**Page navigation**

Open a new local context menu with options for moving to the next or previous page.
**Cursor control menu**

Open a new local context menu with options for moving the cursor and editing text.

Options in the cursor control menu include:
- Move cursor to beginning and move cursor to end
- Cut, Copy, Paste, Select all
- Start selection mode and End selection mode.

To move the cursor while in an edit box, you can tap the volume keys.

**Links menu**

When you navigate to text that contains links, you can open the local context menu, and select the Links submenu to select one of the links included in the text.

**Word**

Each swipe to the right speaks one word of the currently focused item.

**Change granularity menu**

Select this option to open a new local context menu with the navigation granularity options listed above (Default, Page, Paragraph, Line, Word and Character).

In certain apps (such as web browsers), you may also see options to navigate by Headings and Landmarks, Links, Lists, Controls and Special Content, e.g. tables.

**Label controls**

This menu allows you to add, remove, and edit customized labels for unlabeled content. Sometimes applications are missing labels on images. You can use TalkBack to create your own labels for these images, to make it easier to identify them in the future.
Screen blanking

With TalkBack 4.2 and later, there is an option to dim/undim the screen from the Global Context menu. For older devices you can download the free Android app Shades to accomplish the same thing. This is a useful technique for testing since it allows the tester to have a similar experience to users who can’t see the screen.

- To blank the screen, run Shades and turn down the screen-brightness slider to 0.
- To un-blank the screen and bring it back to full brightness, press the power button rapidly several times—that’s the trigger to disable Shades.

SWITCH ACCESS

To enable switch access, navigate to Settings → Accessibility → Switch access and then switch the button to On.

Switch access allows you to control your device using configurable key combinations. This means you can use an external keyboard or switch device to execute core keyboard commands to navigate and interact with websites and native apps. As with the use of TalkBack, this is a useful feature for testing keyboard access and content order.

To use switch access, you’ll need a keyboard paired with the tablet or mobile. Then you’ll need to assign keys to actions through Settings → Accessibility → Switch access → Settings. Select Actions under the heading “Assign Keys to Actions” to map a keystroke to the action.
Recommended keystroke mappings

While keystroke mappings depend on user preference, we recommend (for consistency) that test teams use the same keystrokes, as shown in the table below.

<table>
<thead>
<tr>
<th>Global context menu features</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto scanning</td>
<td>Space bar (this is already mapped)</td>
</tr>
<tr>
<td>Next</td>
<td>Tab</td>
</tr>
<tr>
<td>Previous</td>
<td>Shift + Tab</td>
</tr>
<tr>
<td>Click</td>
<td>Enter</td>
</tr>
<tr>
<td>Long click</td>
<td>Semi colon (;)</td>
</tr>
<tr>
<td>Scroll forward</td>
<td>Right arrow</td>
</tr>
<tr>
<td>Scroll backwards</td>
<td>Left arrow</td>
</tr>
<tr>
<td>Back</td>
<td>Delete</td>
</tr>
<tr>
<td>Home</td>
<td>Escape</td>
</tr>
<tr>
<td>Notifications</td>
<td>Equals (=)</td>
</tr>
<tr>
<td>Quick settings</td>
<td>Down arrow</td>
</tr>
<tr>
<td>Recent apps</td>
<td>Up arrow</td>
</tr>
</tbody>
</table>

**AUTO SCANNING**

Auto scanning is a feature that moves focus automatically through all visible elements on screen, both focusable and inactive (for example, static text). Once all visible content has been auto scanned, the user is presented with five additional auto scan options:

1. Back
2. Home
3. Recent apps
4. Notifications
5. Quick navigation

This is a useful tool for testing content and focus order.
**MAGNIFICATION GESTURES**

To enable Zoom, navigate to Settings → Accessibility → Magnification Gestures then switch the button to On.

When magnification gestures are enabled, you can zoom, pan across the screen and pan content:

1. Zoom in or out by triple-tapping the screen. Then, while zoomed in, you can:
   - Drag two or more fingers to pan across the screen.
   - Pinch two or more fingers together or spread them apart to adjust the zoom level.

   **Note:** If you enter or exit an app when zoomed in, you automatically zoom out. Simply triple-tap to zoom in again.

2. You can also temporarily magnify what’s under your finger by triple-tapping and holding. In this magnified state, you can drag your finger to explore different parts of the screen. Lift your finger to return to your previous state.

   **Note:** Triple-tap for magnification works everywhere except the keyboard and navigation bar.
GREYSCALE

To enable Android’s grayscale view, first enable Developer Mode on your device. (This is a one-time process for each device.)

1. Go to Settings → About Tablet (which might also be labeled About Phone or About Device).
2. Locate the Build number section, and tap on the phrase “Build number” 7 times.
3. Go back to the main Settings page and tap on Developer Options.
4. Enable the Developer Options switch.

From then on, you can enable Android’s grayscale view (Lollipop 5.0 onwards) by going to Settings → Developer Options → Simulate color space and selecting “Monochromacy.” Once you’ve made that selection, display colors will be replaced by shades of gray.

Grayscale is applied to all screens until you turn off the feature, which you can do by going back to Settings → Developer Options → Simulate color space and selecting “Disabled.”

Android’s grayscale view can be used alongside any of Android’s other modes or applications, including TalkBack and Shade, among others.
The native Android browser, Chrome, has basic support for web browsing with TalkBack. This means that some of the newer techniques found in WAI ARIA or HTML5 may not be compatible and may not be announced correctly by TalkBack if you were to use it with Chrome. Firefox for Android has better support for WAI ARIA and HTML5 as well as more robust support for core HTML such as headings, WAI ARIA Landmarks, data tables and so on. So we recommend testing on Firefox for Android.

Ideally, the best web development practice is to use core HTML where possible and only use WAI ARIA and HTML5 where functionality can’t be achieved through core HTML. Where WAI ARIA and HTML5 must be used, keep in mind that while they may not be fully supported in Chrome with TalkBack, that support may exist elsewhere:

1. Firefox on Android
2. Other platforms such as iOS
3. Future versions of Chrome on Android

**Navigating Firefox**

Firefox uses the three-finger swipe to navigate elements.

A three-finger swipe up or down cycles between the options listed below.

- List items (not lists)
- Links
- Headings
- Form elements (edit boxes, checkboxes, buttons...)
- Landmarks

A three-finger swipe left or right moves up or down the page by the selected element:

The consistency of this feature may vary across devices and versions. For example, three-finger gestures do not appear to work on the Hudl running KitKat 4.4.2.
Firefox quick-navigation keystrokes that work with TalkBack

Firefox supports quick navigation keys with TalkBack. These work with a physical keyboard, a Bluetooth keyboard connected to your Android device, or the Eyes-Free keyboard in typing mode.

Keystrokes will only work when focus is in the HTML and not on the browser UI or in a text field.

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Moves to next named anchor</td>
</tr>
<tr>
<td>b</td>
<td>Moves to next button</td>
</tr>
<tr>
<td>c</td>
<td>Moves to next combobox or listbox</td>
</tr>
<tr>
<td>e</td>
<td>Moves to next text entry or password field</td>
</tr>
<tr>
<td>f</td>
<td>Moves to next form field (button, combobox, text entry, radio button, slider, checkbox)</td>
</tr>
<tr>
<td>g</td>
<td>Moves to next graphic</td>
</tr>
<tr>
<td>h</td>
<td>Moves to next heading of any level</td>
</tr>
<tr>
<td>i</td>
<td>Moves to next item in an unordered, ordered or definition list</td>
</tr>
<tr>
<td>k</td>
<td>Moves to next hyperlink</td>
</tr>
<tr>
<td>l</td>
<td>Moves to next unordered, ordered or definition list</td>
</tr>
<tr>
<td>p</td>
<td>Moves to next page tab (in ARIA-enabled web apps)</td>
</tr>
<tr>
<td>r</td>
<td>Moves to next radio button</td>
</tr>
<tr>
<td>s</td>
<td>Moves to next separator</td>
</tr>
<tr>
<td>t</td>
<td>Moves to next data table</td>
</tr>
<tr>
<td>x</td>
<td>Moves to next checkbox</td>
</tr>
</tbody>
</table>
The **Android Accessibility Scanner** suggests accessibility improvements for Android apps such as enlarging small touch targets, increasing contrast and providing content descriptions.

The Accessibility Scanner is only compatible with later versions of Android and can be accessed via **Settings → Accessibility → Accessibility Scanner**. To run the scanner, open the app and tap the Accessibility Scanner button.
GETTING STARTED

iOS accessibility features can be enabled on iOS devices through **Settings → General → Accessibility**.

**VoiceOver:**

- Pre-installed iOS screen reader. When enabled, VoiceOver reads everything on the screen. In mobile Safari, this includes all web content (text, alternatives for images, links, form fields, tables, and so on). In apps, this includes all buttons, images, form elements, static text, etc.

**Zoom:**

- A full screen magnifier that scales content by 200 percent when enabled and the screen is double tapped with three fingers. Magnification can then be adjusted between 100 and 500 percent. Zoom works throughout iOS as well as together with VoiceOver when enabled.

**Invert Colors:**

- A high-contrast mode for users with low vision, color blindness, and sensitivity to brightness. Once enabled settings apply throughout the system including video.

**Grayscale:**

- This setting removes all color from the display, which can make it easier for users with vision disabilities, such as color-blindness, to read the display.
**VOICEOVER**

VoiceOver users include blind and low-vision users, as well as users with some cognitive or learning difficulties. To enable VoiceOver, navigate to

**Settings → General → Accessibility → VoiceOver**

Then, touch and slide the white Off button (beside the word VoiceOver) to the right to enable VoiceOver. Once in the On position, the button changes color to indicate VoiceOver is enabled.

**ACCESSIBILITY SHORTCUT**

You are able to switch the accessibility features on and off using triple click on the side button (home button for older devices). To enable this go to **Settings → General → Accessibility → Accessibility Shortcut** and select the features (such as VoiceOver) from the list of options. It is recommended you do this as it makes testing a lot quicker and easier as you don’t have to go into settings each time to switch VoiceOver on and off.
THE ROTOR

The Rotor is a virtual control built into VoiceOver. It allows you to select how you navigate through a dial format that lists marked-up elements on screen. It works with web content as well as native apps.

To use the Rotor:

- Place two figures on the screen and twist them like you’re turning a dial. The arrow points to options for how you wish to navigate (for example, by headings).
- Swipe up or down to jump between headings.
- Swipe left or right to move backward or forward through all content on the page.

You can customize which features are included in the Rotor through Settings → Accessibility → VoiceOver → Rotor. These features include:

![Figure 5: The Rotor displayed on screen when VoiceOver is running, showing the “Headings” options selected](image-url)
# VoiceOver Rotor features

<table>
<thead>
<tr>
<th>Rotor features</th>
<th>Description</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Articles</td>
<td>Navigate between articles</td>
<td>Web</td>
</tr>
<tr>
<td>Audio Destination</td>
<td>Change where the audio is routed</td>
<td>Web and apps</td>
</tr>
<tr>
<td>Audio ducking</td>
<td>Toggle audio ducking (lowers the volume of other audio content when VoiceOver speaks).</td>
<td>Web and apps</td>
</tr>
<tr>
<td>Braille screen support</td>
<td>Shows an on screen Braille keyboard</td>
<td>Web</td>
</tr>
<tr>
<td>Buttons</td>
<td>Navigate between buttons</td>
<td>Web</td>
</tr>
<tr>
<td>Characters</td>
<td>Navigate one character at a time</td>
<td>Web and apps</td>
</tr>
<tr>
<td>Containers</td>
<td>Navigate by containers within a page, such as lists, landmarks, tables, etc.</td>
<td>Web and apps</td>
</tr>
<tr>
<td>Form controls</td>
<td>Navigate by form controls</td>
<td>Web</td>
</tr>
<tr>
<td>Handwriting</td>
<td>Fill in text fields by writing on screen</td>
<td>Web</td>
</tr>
<tr>
<td>Headings</td>
<td>Navigate between headings</td>
<td>Web and apps</td>
</tr>
<tr>
<td>Hints</td>
<td>Turn hints on and off</td>
<td>Web and apps</td>
</tr>
<tr>
<td>Images</td>
<td>Navigate images</td>
<td>Web</td>
</tr>
<tr>
<td>Landmarks</td>
<td>Navigate between WAI ARIA Landmarks</td>
<td>Web</td>
</tr>
<tr>
<td>Language</td>
<td>Switch between supported</td>
<td>Web</td>
</tr>
<tr>
<td>Links</td>
<td>Navigate between links</td>
<td>Web</td>
</tr>
<tr>
<td>Lists</td>
<td>Navigate between lists</td>
<td>Web</td>
</tr>
<tr>
<td>Lines</td>
<td>Navigate line by line</td>
<td>Web</td>
</tr>
<tr>
<td>Non-visited Links</td>
<td>Navigate non-visited links</td>
<td>Web</td>
</tr>
<tr>
<td>Punctuation</td>
<td>Announces all punctuation, some punctuation</td>
<td>Web and apps</td>
</tr>
<tr>
<td>Rotor features</td>
<td>Description</td>
<td>Availability</td>
</tr>
<tr>
<td>------------------------</td>
<td>------------------------------------------------------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Same Item</td>
<td>Navigate the previous item</td>
<td>Web</td>
</tr>
<tr>
<td>Search Fields</td>
<td>Navigate search fields</td>
<td>Web</td>
</tr>
<tr>
<td>Sounds</td>
<td>Switch sounds on or off</td>
<td>Web and apps</td>
</tr>
<tr>
<td>Speaking Rate</td>
<td>Increase and decrease the speaking rate</td>
<td>Web and apps</td>
</tr>
<tr>
<td>Static Text</td>
<td>Navigate between static text</td>
<td>Web</td>
</tr>
<tr>
<td>Tables</td>
<td>Navigate between tables</td>
<td>Web</td>
</tr>
<tr>
<td>Text Fields</td>
<td>Navigate between text fields</td>
<td>Web</td>
</tr>
<tr>
<td>Typing Mode</td>
<td>Switch between Standard, Touch, and Direct Touch typing</td>
<td>Web</td>
</tr>
<tr>
<td>Vertical Navigation</td>
<td>Flicking up or down, left or right is similar to using arrow keys on desktop</td>
<td>Web and apps</td>
</tr>
<tr>
<td>Visited links</td>
<td>Navigate between visited links</td>
<td>Web</td>
</tr>
<tr>
<td>Volume</td>
<td>Increase and decrease the volume</td>
<td>Web and apps</td>
</tr>
<tr>
<td>Words</td>
<td>Navigate between words</td>
<td>Web and apps</td>
</tr>
<tr>
<td>Zoom</td>
<td>Switch zoom on and off</td>
<td>Web</td>
</tr>
</tbody>
</table>

For testing purposes we recommend that you select at least these features within the Rotor:

- Buttons
- Containers
- Form controls
- Headings
- Hints
- Images
- Landmarks
- Links
- Lists
- Search fields

The Language Rotor allows users to switch VoiceOver to use different languages. This setting is important so that second-language users can select English in the Rotor in order for content to be pronounced correctly.
BASIC GESTURES

You may get an alert that VoiceOver changes the gestures used to control the device. Select OK.

Once you enable VoiceOver, the way you interact with the device changes. There are two interaction methods:

1. Explore by touch:

   Drag your finger over the screen to have VoiceOver describe the items under your finger.

   You can tap with a second finger or double-tap to open links, press buttons, and so on.

2. Gesture navigation:

   You can swipe right with a single finger to move from one item to the next in sequence.

   You can swipe left to go backward through this sequence. VoiceOver describes items as you move focus around the screen.

   You can double-tap to open links, press buttons, and navigate using the Rotor.
Core VoiceOver commands

These are VoiceOver’s core touch and gesture commands:

Switch VoiceOver on/off
- Triple-click the side button

Speak an element
- Single tap

Activate an element
- Double tap

Scroll
- Flick three fingers

Rotor
- Turn a dial with two fingers

Zoom
- Three-finger double tap

Jump to the previous/next Rotor item
- Swipe up / down

Select previous / next
- Swipe left / right
Tip: A good place to practice VoiceOver gestures is in the VoiceOver Practice area found in

Settings → General → Accessibility → VoiceOver.

VoiceOver needs to be enabled for the VoiceOver Practice button to appear.
SCREEN CURTAIN

Sighted developers and testers can turn off the screen to understand how well content is communicated when it can't actually be seen. Turn off the display by triple-tapping the screen with three fingers. This is an essential feature when testing.

Note: If you have both VoiceOver and Zoom enabled at the same time, Screen Curtain is enabled with a three-finger quadruple tap. For accessibility testing, we require running the features in isolation. But it could be useful to try running the features together on a few screens.

SPEECH OFF

You can temporarily mute VoiceOver by double-tapping the screen with three fingers.

Note: If you have VoiceOver and Zoom enabled at the same time, you can toggle speech output with a three-finger triple tap. For accessibility testing, we require running the features in isolation. But it could be useful to try running the features together on a few screens.

PASS-THROUGH GESTURE

You can use the pass-through gesture to tell VoiceOver to treat the next gesture as a standard iOS gesture. You can perform the pass-through gesture by double-tapping the screen and holding down your finger on the second tap for one second before performing the standard iOS gesture.

A short audio prompt after you’ve held the second tap for one second tells you that iOS is ready for you to perform the standard gesture.

For example, to scroll a view, double-tap and hold for one second before swiping left or right. You can also use the pass-through gesture for drag-and-drop functionality, or to adjust a slider with more precision than the usual VoiceOver behavior of giving the slider focus and requiring up and down swipes to adjust the value.
People with low vision often use Zoom. Users with cognitive impairments, such as autism, may also use Zoom to focus in on key content and reduce the amount of visual clutter on the screen. To enable full screen Zoom, first navigate to the Zoom screen and select **Settings → General → Accessibility → Zoom**

Then, touch and slide the white Off button (beside the word *Zoom*) to the right to enable Zoom. Once in the On position, the button changes color to indicate Zoom is enabled.

Standard iOS gestures—flick, pinch, tap, and rotor—still work when the screen is magnified. Invert Colors and Grayscale also work with Zoom. There are some differences in commands when Zoom is run with VoiceOver: see the [VoiceOver Basic Gestures](#) section.

You can view magnified screens either in either “Full Screen Zoom” or “Window Zoom”.

### Zoom Commands

**Toggle Zoom on/off**

- Double-tap 3 fingers
- Single tap
- Double tap

**Scroll**

- Flick three fingers
- Rotor
  - Turn a dial with two fingers
  - Jump to the previous/next Rotor item
  - Swipe up / down
<table>
<thead>
<tr>
<th>Action</th>
<th>Gesture Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select previous / next</td>
<td>Swipe left / right</td>
</tr>
<tr>
<td>Next / previous page</td>
<td>Three-finger swipe right / left</td>
</tr>
<tr>
<td>Speak additional information</td>
<td>Three-finger tap</td>
</tr>
<tr>
<td></td>
<td><em>Such as position on screen, pagination, position in a table, and so on</em></td>
</tr>
<tr>
<td>Pass-through gesture</td>
<td>Two-finger tap and hold</td>
</tr>
<tr>
<td>Play / pause media</td>
<td>Two-finger double tap</td>
</tr>
<tr>
<td></td>
<td><em>Audio, video, voice memos, photos</em></td>
</tr>
<tr>
<td>Screen curtain on / off</td>
<td>Three-finger quadruple tap</td>
</tr>
<tr>
<td>Mute / un-mute VoiceOver</td>
<td>Three-finger triple tap</td>
</tr>
</tbody>
</table>
INVERT COLORS

To enable Invert Colors, first navigate to Settings → General → Accessibility → Display Accomodations → Invert Colors.

Then, touch and slide the white Off button (beside the words Smart Invert or Classic Invert) to the right to enable Invert Colors. Once in the On position, the button changes color and display colors are inverted to indicate Invert Colors is enabled.

The color inversion is applied to all screens until the feature is disabled by sliding the button to the Off position.

Invert Colors can be used with VoiceOver, Zoom, and Grayscale.

GRAYSCALE

To enable Grayscale, first navigate to Settings → General → Accessibility → Display Accomodations → Color Filters and enable the Color Filters toggle to view grayscale and other filters.

Then, touch and slide the white Off button (beside the words Grayscale) to the right to enable Grayscale. Once in the On position, the button changes to dark gray and display colors are replaced by grayscale colors to indicate Grayscale is enabled.

Grayscale is applied to all screens until the feature is disabled by sliding the button to the Off position.

Grayscale can be used with VoiceOver, Zoom, and Invert Colors.

TESTING TOOLS

The Accessibility Inspector in Xcode can be used to test for missing or incorrect labels, traits and hints amongst other things. This can be run in the developer environment or using the iOS simulator.
STANDARDS

- Section 508 of the US Rehabilitation Act
- W3C: Web Content Accessibility Guidelines (WCAG) 2.1

GUIDELINES

- W3C Mobile Accessibility Task Force extension
- W3C Note: Mobile Accessibility: How WCAG 2.0 and UAAG 2.0 Apply to Mobile Devices
- W3C: Techniques for WCAG 2.1
- WCAG 2.0 Techniques Applicable to Mobile without Changes
- BBC: Mobile Accessibility Guidelines
- Mobile Accessibility Guidelines for Developers
ANDROID RESOURCES

- Accessibility – Android Developers
- Accessibility – Android Design
- Android Testing Tools

APPLE RESOURCES

- Apple Accessibility
- iOS Human Interface Guidelines
- Apple Accessibility Mailing List
- Accessibility Programming Guide for iOS - A technical introduction to iOS accessibility features, using its accessibility API to implementing accessibility in native apps, and testing apps for accessibility.
- Accessibility on iPhone – A technical introduction to iOS accessibility features and API.
- Making Your iPhone Application Accessible – A springboard for implementing accessibility in native iOS apps.
- Testing the Accessibility of Your iPhone Application
- UIAccessibility Protocol Reference – A full reference for iOS’s main accessibility API methods and properties, a great place to start when you need to find a way to handle special use cases.
- UIAccessibilityContainer Protocol – Useful for understanding how to contain and group interface elements, especially when creating custom views.
- UIAccessibilityFocus Protocol – Useful when handling focus, listening to changes in VoiceOver focus, and so on.
- Xcode toolset
- iOS Simulator User Guide
ARTICLES AND OTHER RESOURCES

- WebAIM Articles

- Georgia Tech Research Institute: Accessibility Assistant: Accessibility Information

- What’s ‘large text’ in WCAG 2.0 parlance? - Helpful for deciding the color contrast requirements for text of different sizes.

- Google I/O 2013 Enabling blind and low-vision accessibility on Android (video)

- Google I/O 2012 – Making android apps accessible (video)

- Testing with Android

- Accessibility Testing Criteria for Android

- Browsing the Web with Chrome and TalkBack

- Learning iOS VoiceOver gestures (PDF) – A cheat sheet that will help you to remember the gestures used to control VoiceOver.

- Accessibility for iPhone and iPad apps