



Chameleon 20



User Guide





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Getting Started

Welcome to your new Chameleon™ 20 braille display.

This user guide provides instructions for orientation, usage, navigation, and updating of the device. For more information please refer to the [Chameleon 20 product page](#) on the APH website or call APH Customer Service at 1(800) 223-1839.

In the Box

The box contains the following items:

- Chameleon 20 braille display
- USB-C to USB-A cable
- USB to AC adapter
- Three thermoplastic polyurethane (TPU) bumper cases in pomegranate, purple, and teal
- Nylon carrying case with lanyard
- Sheet of various bug stickers and logos
- Print and braille Getting Started guides

Orientation of Chameleon 20

The Chameleon has a 20-cell braille display, a Perkins-style keyboard, two space bars, a Home button and four thumb keys for navigation.

Top Face

The top face of the Chameleon can be divided into two sections: front and rear.

The front section of the top face consists of a refreshable braille display containing 20 braille cells and 20 cursor-routing buttons. Each cursor-routing button is associated with the braille cell directly below it. When editing text, pressing one of the cursor-routing buttons moves the editing cursor to the associated braille cell. While in the menus, pressing any cursor-routing button activates the selected item.

The rear section of the top face includes a Perkins-style braille keyboard where each key represents a dot on a braille cell. The keys under your left hand represent Dots 1, 2, 3, and Backspace, where Dot 1 is located under your index finger and Backspace under your little finger. The keys under

your right hand represent Dots 4, 5, 6, and Enter, where Dot 4 is located under your index finger and Enter is under your little finger.

Front Edge

On the front edge of the Chameleon are five buttons. From left to right, the buttons are as follows:

- Previous thumb key
- Left thumb key
- Home button (circular shape) – used to return to the Main menu or exit Terminal mode
- Right thumb key
- Next thumb key

Left Edge

On the left edge, from front to back are the following:

- USB-A port
- Power button – Press and hold this button for 2 seconds to turn the device on.
- Green LED – This lights up to visually indicate the status of the device.
- USB-C port – Use the cable that came with your Chameleon to connect it to a power outlet or a PC.

Right Edge

On the right edge, from front to back, are the following:

- Two volume buttons
- 3.5mm Audio jack

Rear Edge

The left side of the rear edge contains an SD-card port. This port allows you to insert SD cards for external storage.

Bottom Side

In each corner underneath your Chameleon is one of four anti-slip pads. In the middle, closer to the front edge is a slightly indented rectangle with



a different texture. In this rectangle is a sticker containing printed hardware information about your Chameleon. Above the sticker, there is a braille label containing the serial number of your device.

Towards the back-left of the device is the battery compartment. It is closed and secured with two Phillips-head screws.

Charging Chameleon 20

Prior to using your Chameleon, make sure you charge it completely.

Connect the USB-C end of the cable to the USB-C port located on the left edge of your Chameleon. Minimal effort is required and forcing the connection can damage the cable or the device.

Connect the USB-A end of the recharge cable to the power adapter, then plug the power adapter into a power outlet. Use the provided power adapter for optimal recharge.

Alternatively, you can charge the device using your computer and the USB-A to USB-C cable, but note that this method of charging is slower than charging with a power adaptor.

Powering On and Off

The Power button is on the left edge of the Chameleon. It is oval shaped with a raised dot in the center.

Press and hold the Power button for approximately 2 seconds to power on the Chameleon. There will be a quick vibration and “**starting**” will appear on the braille display, along with a tactile loading animation that circles during start-up.

A few moments after you boot your device for the first time, you will be welcomed with a language selection menu. Press Enter to open the list of languages, select one and press Enter to close the list. Close the dialog box once the changes are completed. The options of the menu will be spoken via a text-to-speech feature using the default primary selected voice.

After a few seconds, the start-up is complete and “editor” appears on the braille display. Your Chameleon is now ready for use.

To power off, press and hold the Power button for approximately 2 seconds. A confirmation message will appear on the braille display. Select OK by pressing the Previous or Next thumb key, then press Enter or a cursor-routing key.



Alternatively, you can follow these steps to power off the Chameleon:

1. Press P to reach the Power Off menu item.
2. Press Enter or a cursor-routing key.
3. Select OK by pressing the Previous or Next thumb key.
4. Press Enter or a cursor-routing key.

Adjusting the Sleep Mode

To preserve the battery, Chameleon goes into Sleep mode after 5 minutes of inactivity. You can adjust the length of time in the settings. You can also manually put your device into Sleep mode by a short press of the power button.

To wake up the device, press the power button.

About the About Menu

The About menu provides various information about your device, such as version numbers, model number, serial number, licenses, and copyright.

To open the About menu:

1. Go to the Main menu.
2. Select Settings.
3. Press Enter.
4. Go to the About item.
5. Press Enter.

Alternatively, you can use the shortcut Space + I to open the About dialog.



Navigating and Using Menus

Navigating the Main Menu

The Main menu options are:

- Editor
- Terminal
- Library
- Braille Editor
- File Manager
- Calculator
- Date and Time
- Settings
- Online services
- User guide
- Power off

Press the Previous or Next thumb key to scroll through the list to the menu item of your choice. Then press Enter or a cursor-routing key to access it.

You can return to the Main menu at any time by pressing the Home button or Space with all six Dots.

Panning Text on the Braille Display

Oftentimes, the text on the braille display is too long to fit on a single line. To read the entire sentence, scroll or “pan” the text ahead or back by pressing the Left and Right thumb keys on the Chameleon. The Left and Right thumb keys are the second and third buttons on the front edge of the device.

Using the Context Menu for Additional Functions

The Context menu is a special menu that is accessed from almost everywhere in the device. It offers useful contextual functions that are relevant to what you’re currently doing on your Chameleon. Think of it as the context menu on a PC (the menu you get when you right-click the mouse). If you’re looking for a specific action, or simply forgot the shortcut, chances are it can be found in the Context menu.



To activate the Context menu, press Space + M. A menu will open with a list of actions you can perform at that moment. Scroll through the menu to the desired action and press Enter or a cursor-routing key.

Press Space + E to exit the Context menu.

Navigating by First Letters of Words

Most of the time, you can jump to an item in a menu by typing the first letter of that item. Doing so automatically moves your focus to the first item in the list starting with that letter. Typing the same letter twice moves the focus to the second item in the list starting with that letter, and so on.

For example, to reach the Settings menu on the Chameleon, type the letter 'S' on your keyboard.

Using Shortcuts/Key Combinations to Navigate

As the name implies, shortcuts, also known as key combinations, make it easy to quickly navigate through a menu or file.

The most used shortcuts on the Chameleon 20 are indicated in Table 1.



Table 1: Shortcut/Key Combination Table

Action	Shortcut or Key Combination
Activate selected item	Enter or cursor-routing key
Esc or Back	Space + E
Previous item	Previous thumb key or Space + Dot 1
Next item	Next thumb key or Space + Dot 4
Jump to any item in a list	Type the first letter of the item or app
Pan left or right	Left or Right thumb key
Go to top	Space + Dots 1-2-3
Go to bottom	Space + Dots 4-5-6
Toggle braille grade	Backspace + G
Switch language profile	Enter + L
Battery level	Enter + P
Context menu	Space + M
Main menu	Space + Dots 1-2-3-4-5-6 or Home button
System information	Space + I
Time	Enter + T
Date	Enter + D
Eject media	Enter + E
Create a quick note	Backspace + N
Create a quick braille note	Backspace + B
Toggle speech on/off	Space + Previous Thumb Key
Increase speech rate	Enter + Dot 5
Decrease speech rate	Enter + Dot 2
Search for Wi-Fi	Backspace + Enter + S

Note: All commands that include Enter or Backspace must have the Spacebar added to them when using computer braille.

Using the Editor Application

The Editor is an application that allows you to open, edit, and create text files on the Chameleon. You can open .docx, .doc, .txt, .brf, .brl, .pdf, .ban, and .bra files with the Editor. The files you create or modify are saved as .txt files.

To open the Editor, press the Next thumb key until you reach Editor or press 'E' in the Main menu, then press Enter or a cursor-routing key.

The Editor opens in the Editor menu, which includes Create File, Open File, Editor settings, and Close.

Create a File

There are several ways to create a file depending on your current location on the device.

- If you are in the Editor menu, select Create File and press Enter or a cursor-routing key.
- From the Context menu, select and activate the File menu, then select Create File.
- Alternatively, press Backspace + N from anywhere on the device to quickly create a new file.

The cursor will be visible between two braille brackets and can be set as blinking in the User settings. You can begin writing in your new file.

Open a File

If you are in the Editor menu, select Open File and press Enter or a cursor-routing key. Alternatively, you can press Backspace + O, then select the file you wish to open using the Previous and Next thumb keys.

Note that the Chameleon may display an error message when a PDF file is opened. This generally occurs when the file contains primarily images rather than text.

Recently Saved

You can open a list of the last ten documents you previously saved for quick access.

To open a list of the ten most recent files, select the editor from the main menu. Use your Previous or Next thumb keys until you reach recently saved



and press Enter.

You can scroll through the ten most recent files using the Previous and Next thumb keys. Press Enter or a cursor-routing key to open a file from the list.

Close a File

To close a file that is opened in Editor, press Space + E. Alternatively, open the Context menu using Space + M, then scroll to and activate the File menu. Select Close File Item.

If there are changes to your file that have not been saved, you will be asked if you want to save the changes before closing.

Save a Text File

There are two types of saving in the Editor: Save and Save as.

Save: Press Space + S to save your file to an already existing file name.

Save as: Press Backspace + S to save a copy of your file with a new file name and to change the file location.

If your file has never been saved, the Editor will ask you to enter a new file name regardless of the save method you choose.

Note that if you open a file under any extension other than .txt, the device will prompt a message asking if you wish to keep the original file in addition to the .txt file that will be saved.

Using Auto-Scroll in the Editor

The Editor app includes an Auto-Scroll feature that automatically pans through the written text on the braille display.

To start Auto-Scroll, press Enter + Dots 1-2-4-5-6.

To stop Auto-Scroll, press any key.

Modifying Auto-Scroll Speed

You can change the Auto-Scroll speed when auto-scrolling inside a file.

To slow down Auto-Scroll, press Enter + Dot 3.

To speed up Auto-Scroll, press Enter + Dot 6.

Finding Text in a File

To find text in your file, press Space + F. Enter your search term in the blank field. Your cursor will be placed at the first location the text is found.

Press Space + N to find additional instances of the search word.

Press Space + P to reach previous instances of the search word.

Finding and Replacing Text

To find and replace text:

1. Press Backspace + F.
2. Enter the text to find in the first edit box, called Find.
3. Enter the replacement text in the second edit box, called Replace.
4. Select Replace All to replace all text found with the text in the Replace box.
5. Select Next to find and replace the next instance of the word.
6. Select Previous to find and replace the previous instance of the word.

Cutting, Copying, and Pasting Text

The Editor lets you cut, copy, and paste text in a way similar to computer programs.

To select the text, position your cursor on the first character using a cursor-routing key, then press Enter + S.

Alternatively, you can select text from the Context menu:

1. Open the Context menu with Space + M.
2. Scroll down to Edit.
3. Press Enter or a cursor-routing key.
4. Scroll down to Select Text.
5. Press Enter or a cursor-routing key.

This marks the start of your selection. Now go to the location at the end of your selection, and press Space + S to end the selection.

To select all text included in the file, press Enter + Dots 1-2-3-4-5-6.

To copy the selected text, press Backspace + Y.

To cut the selected text, press Backspace + X.



To paste the copied or cut text, position your cursor where you want the text to be pasted using a cursor-routing key and press Backspace + V.

As always, these commands can be accessed through the Context menu.

The Backspace + Y shortcut can also be used to copy the last result from the Calculator application and the current paragraph in the Library application.

Using Read Mode

Read mode allows you to read files without the possibility of editing content by mistake. You cannot edit files while in Read mode.

To activate or deactivate Read mode, press Space + X.

To activate or deactivate Read mode from the Context menu:

1. Press Space + M to activate the Context menu.
2. Scroll to File using the Previous and Next thumb keys.
3. Press Enter or a cursor-routing key.
4. Scroll to Read mode using the Previous and Next thumb keys.
5. Press Enter or a cursor-routing key.

Adding, Navigating, and Removing Bookmarks

Bookmarks are a useful way to keep your location within a file and allow you to return quickly to that position later.

To open the Bookmark menu, press Enter + M. You can also press Space + M to open the Context menu and select Bookmark menu.

Inserting a Bookmark

To add a bookmark in a file:

1. Press Enter + M to open the Bookmark menu.
2. Select Insert Bookmark using the Previous and Next thumb keys.
3. Press Enter or a cursor routing key.
4. Enter a specific unused bookmark number.
Note: If you do not enter a number, Chameleon selects the first available number and assigns it to the bookmark.
5. Press Enter.

Alternatively, you can insert a Bookmark by pressing Enter + B. Note that a maximum of 98 bookmarks can be inserted in a document.



Navigating to Bookmarks

To jump to a bookmark, press Enter + J. You are prompted to enter the bookmark number. Enter the bookmark number you wish to navigate to, then press Enter.

Removing Bookmarks

To remove a saved Bookmark:

1. Press Enter + M to open the Bookmark menu.
2. Scroll to Remove Bookmark using the Previous and Next thumb keys.
3. Press Enter or a cursor routing key.
4. Enter the Bookmark number you want to remove.
5. Press Enter.

Note: If you want to remove all bookmarks in the document type 99 when prompted for a Bookmark number.

Toggle Text Indicators

Text indicators are a useful tool to help you locate your position when working in a document with the Editor. Upon activating the text indicators, brackets will appear on the braille display to indicate the beginning and the ending of the text.

To toggle text indicators:

1. Press Space + M to activate the Context menu.
2. Use the Previous or Next thumb keys until you reach File Menu and press Enter.
3. Use the Previous or Next thumb keys until you read editor settings and press Enter.
4. Use the Previous or Next thumb keys until you reach show text editor indicators.
5. Press Enter to deactivate the Text indicators; press Enter again to activate them.

Note that toggling Text Indicators will only apply to the editor; all other edit fields will continue to include text indicators.

Editor Commands Table

The Editor commands are listed in Table 2.

Table 2: Editor Commands

Action	Shortcut or Key Combination
Activate Edit mode	Enter or a cursor-routing key
Leave Edit mode	Space + E
Create file	Backspace + N
Open file	Backspace + O
Save	Space + S
Save as	Backspace + S
Find	Space + F
Find next	Space + N
Find previous	Space + P
Replace	Backspace + F
Start/stop selection	Enter + S
Select all	Enter + A
Copy	Backspace + Y
Cut	Backspace + X
Paste	Backspace + V
Delete previous word	Backspace + Dot 2
Delete current word	Backspace + Dots 2-5
Delete previous character	Backspace
Move to next edit box while editing	Enter
Move to next edit box without editing	Next thumb key

Action	Shortcut or Key Combination
Move to previous edit box without editing	Previous thumb key
Move insertion point to start of text field document	Space + Dots 1-2-3
Move insertion point to end of text field document	Space + Dots 4-5-6
Start auto-scroll	Space + Dots 1-2-4-5-6
Increase auto-scroll speed	Enter + Dot 6
Decrease auto-scroll speed	Enter + Dot 3
Read all (text-to-speech feature)	Space + G
Stop reading (text-to-speech feature)	Backspace + Enter
Toggle Reading mode	Space + X
Bookmark menu	Enter + M
Jump to bookmark	Enter + J
Insert bookmark	Enter + B

Using the Braille Editor Application

The Braille Editor is an application similar to the Editor, but explicitly designed to edit, open and create braille documents in .brf and .brl formats. The files are created, modified, and saved as .brf.

To open the Braille Editor, press the Next thumb key until you reach Braille Editor or press “B” in the Main menu, then press Enter or a cursor-routing key.

The Braille Editor opens in the Braille Editor menu, which includes Create File, Open File, Braille Editor Settings, and Close.

Note that the Text-to-speech (TTS) feature is not possible with the Braille Editor application.

Create a File

There are several ways to create a file, depending on your current location on the device.

- If you are in the Braille Editor menu, select Create File and press Enter or a cursor-routing key.
- From the Context menu, select and activate the File menu, then select Create File.
- Alternatively, press Backspace + B from anywhere on the device to quickly create a new .brf file.

The cursor will be visible between two braille brackets, and can be set as blinking in the User settings. You can begin writing in your new file.

Open a File

If you are in the Braille Editor menu, select Open File and press Enter or a cursor-routing key. Alternatively, you can press Backspace + O, then select the file you wish to open using the Previous and Next thumb keys.

Recently Saved

You can open a list of the last ten documents you previously saved for quick access.

To open a list of the ten most recent files, select the editor from the main menu. Use your Previous or Next thumb keys until you reach recently saved and press Enter. You can scroll through the ten most recent files using the



Previous and Next thumb keys. Press Enter or a cursor-routing key to open a file from the list.

Close a File

To close a file that is opened in the Braille Editor, press Space + E. Alternatively, open the Context menu using Space + M, then scroll to and activate the File menu. Select Close File Item.

If there are changes to your file that have not been saved, you will be asked if you want to save the changes before closing.

Save a Braille File

There are two types of saving in the Braille Editor: Save and Save as.

Save: Press Space + S to save your file to an already existing file name.

Save as: Press Backspace + S to save a copy of your file with a new file name and to change the file location.

If your file has never been saved, the Braille Editor will ask you to enter a new file name regardless of the save method you choose.

Export a Braille File to Text

The .brf files opened in the Braille Editor application can be exported as text files. This can be useful if you wish to open them in the Editor application and work on them in another format, and also to read them using the Text-to-speech feature.

To export a braille file to text:

1. Press Space + M to open the Context menu.
2. Use the Previous and Next thumb keys to select the option Export as text and press Enter.
3. The Chameleon will display a list of braille tables for exportation. Use the Previous and Next thumb keys to select the braille table of your choice and press Enter.
4. You will be prompted to enter a name for the exported file. Type the desired name and press Enter.
5. You will be prompted with the list of File Manager folders in which you can save your newly created file. Select the folder of your choice using the Previous and Next thumb keys and press Enter.

Using Auto-Scroll in the Braille Editor

The Braille Editor app includes an Auto-Scroll feature that automatically pans through the written text on the braille display.

To start Auto-Scroll, press Enter + Dots 1-2-4-5-6.

To stop Auto-Scroll, press any key.

Modifying Auto-Scroll Speed

You can change the Auto-Scroll speed when auto-scrolling inside a file.

To slow down Auto-Scroll, press Enter + Dot 3.

To speed up Auto-Scroll, press Enter + Dot 6.

Finding Text in a File

To find text in your file, press Space + F. Enter your search term in the blank field. Your cursor will be placed at the first location the text is found.

Press Space + N to find additional instances of the search word.

Press Space + P to reach previous instances of the search word.

Finding and Replacing Text

To find and replace text:

1. Press Backspace + F.
2. Enter the text to find in the first edit box, called Find.
3. Enter the replacement text in the second edit box, called Replace.
4. Select Replace All to replace all text found with the text in the Replace box.
5. Select Next to find and replace the next instance of the word.
6. Select Previous to find and replace the previous instance of the word.

Cutting, Copying, and Pasting Text

The Braille Editor lets you cut, copy, and paste text in a way similar to computer programs.

To select the text, position your cursor on the first character using a cursor-routing key, then press Enter + S.

Alternatively, you can select text from the Context menu:



1. Open the Context menu with Space + M.
2. Scroll down to Edit.
3. Press Enter or a cursor-routing key.
4. Scroll down to Select Text.
5. Press Enter or a cursor-routing key.

This marks the start of your selection. Now go to the location at the end of your selection, and press Space + S to end the selection.

To select all text included in the file, press Enter + Dots 1-2-3-4-5-6.

To copy the selected text, press Backspace + Y.

To cut the selected text, press Backspace + X.

To paste the copied or cut text, position your cursor where you want the text to be pasted using a cursor-routing key and press Backspace + V.

As always, these commands can be accessed through the Context menu.

The Backspace + Y shortcut can also be used to copy the last result from the Calculator application and the current paragraph in the Library application.

Using Read Mode

Read mode allows you to read files without the possibility of editing content by mistake. You cannot edit files while in Read mode.

To activate or deactivate Read mode, press Space + X.

To activate or deactivate Read mode from the Context menu:

1. Press Space + M to activate the Context menu.
2. Scroll to File using the Previous and Next thumb keys.
3. Press Enter or a cursor-routing key.
4. Scroll to Read mode using the Previous and Next thumb keys.
5. Press Enter or a cursor-routing key.

Adding, Navigating, and Removing Bookmarks

Bookmarks are a useful way to keep your location within a file and allow you to return quickly to that position at a later time.

To open the Bookmark menu, press Enter + M. You can also press Space + M to open the Context menu and select Bookmark menu.



Inserting a Bookmark

To add a bookmark in a file:

1. Press Enter + M to open the Bookmark menu.
2. Select Insert Bookmark using the Previous and Next thumb keys.
3. Press Enter or a cursor routing key.
4. Enter a specific unused bookmark number.
Note: If you do not enter a number, Chameleon selects the first available number and assigns it to the bookmark.
5. Press Enter.

Alternatively, you can insert a Bookmark by pressing Enter + B. Note that a maximum of 98 bookmarks can be inserted in a document.

Navigating to Bookmarks

To jump to a bookmark, press Enter + J. You are prompted to enter the bookmark number. Enter the bookmark number you wish to navigate to, then press Enter.

Removing Bookmarks

To remove a saved Bookmark:

1. Press Enter + M to open the Bookmark menu.
2. Scroll to Remove Bookmark using the Previous and Next thumb keys.
3. Press Enter or a cursor routing key.
4. Enter the Bookmark number you want to remove.
5. Press Enter.

Note: If you want to remove all bookmarks in the document type 99 when prompted for a Bookmark number.

Toggle Text Indicators

Text indicators are a useful tool to help you locate your position when working in document with the Braille Editor. Upon activating the text indicators, brackets will appear on the braille display to indicate the beginning and the ending of the text.

To toggle text indicators:

1. Press Space + M to activate the Context menu.



2. Use the Previous or Next thumb keys until you reach file menu and press Enter.
3. Use the Previous or Next thumb keys until you reach editor settings and press Enter.
4. Use the Previous or Next thumb keys until you reach show text editor indicator.
5. Press Enter to deactivate the Text indicators; press Enter again to activate them.

Note that toggling Text Indicators will only apply to the Braille Editor, all other edit fields will continue to include text indicators.

Braille Editor Commands Table

The Braille Editor commands are listed in Table 3.

Table 3: Braille Editor Commands

Action	Shortcut or Key Combination
Activate Edit mode	Enter or a cursor-routing key
Leave Edit mode	Space + E
Create braille file	Backspace + B
Open braille file	Backspace + O
Open recently saved files	Enter + R
Save	Space + S
Save as	Backspace + S
Find	Space + F
Find next	Space + N
Find previous	Space + P
Replace	Backspace + F
Start/stop selection	Enter + S

Action	Shortcut or Key Combination
Select all	Enter + A
Copy	Backspace + Y
Cut	Backspace + X
Paste	Backspace + V
Delete previous word	Backspace + Dot 2
Delete current word	Backspace + Dots 2-5
Delete previous character	Backspace
Move to next edit box while editing	Enter
Move to next edit box without editing	Next thumb key
Move to previous edit box without editing	Previous thumb key
Move insertion point to start of text field document	Space + Dots 1-2-3
Move insertion point to end of text field document	Space + Dots 4-5-6
Start auto-scroll	Space + Dots 1-2-4-5-6
Increase auto-scroll speed	Enter + Dot 6
Decrease auto-scroll speed	Enter + Dot 3
Toggle Reading mode	Space + X
Bookmark menu	Enter + M
Jump to bookmark	Enter + J
Insert Bookmark	Enter + B

Using the Library Application

The Library is the application you use to read or listen to books on the Chameleon. It supports the following file formats: .brf, .pef, .txt, .html, .docx, .pdf, and .rtf, and is compatible with .zip files containing books in text format. Daisy 2, Daisy 2.02 and Niso audiobook formats are also supported by the Library application.

To open the Library app, press the Next thumb key until you reach Library, or press 'L' in the Main menu. Press Enter or a cursor-routing key to access the app.

The Library menu includes Book list, Recently Read, Search, and Close.

Navigating the Book List

In Library, your books are stored in the Book List, comparable to a directory containing all the available media on your device in alphabetical order.

Use the Previous and Next thumb keys to select a book from the Book List, then press Enter or a cursor-routing key.

Note that the Chameleon may display an error message if a book is opened as a PDF. This generally occurs when the file contains mostly images rather than text.

To close a book and return to the Book List, press Space + E or Space + B.

Searching for Books

To search for a specific book on the device:

1. Select Search from the Library menu or press Space + F.
2. Type in the text/name of book.
3. Press Enter. You will be presented with a list of books matching your search criteria.
4. Use the Previous and Next thumb keys to scroll to the book.
5. Press Enter or a cursor-routing key to open it.

Accessing Recently Opened Books

You can open a list of the last five books you previously opened for quick access.

To open a list of the five most recent books, press Enter + R or select Recently Read from the Library menu.

You can scroll through the five most recent books using the Previous and Next thumb keys. Press Enter or a cursor-routing key to open a book from the list.

Managing Your Books

When browsing the Book List, you can copy, move, or delete a selected book from the Library application to an external storage device. The actions that are available for each book depend on the type and location of the book. The Context menu tells you what actions are available.

The basic rules are:

- Books located on the SD card can be deleted.
- Books downloaded from online services can be moved or deleted.
- Books can only be copied or moved when external storage is connected.
- You cannot copy or move books from within the internal storage.

To copy, move, or delete a book:

1. Access the book list by pressing Space + B.
2. Select a book using the Previous or Next thumb key.
3. Press Backspace + M to open the Manage Book menu.
4. Select Copy to, Move to, or Delete.

Navigating and Accessing Additional Information in Books

The easiest way to navigate inside a book is by using the thumb keys. Use the Left and Right thumb keys to pan the text left and right.

Changing the Navigation Level for Books

The Library includes different navigation levels to make navigating through a book easier. Navigation levels are dependent on the file format of the book and may differ from book to book.

To change the Navigation level:

1. Press Space + T.
2. Scroll through the available Navigation levels using the Previous and Next thumb keys.
3. Press Enter or a cursor-routing key to select the Navigation level.



Once the Navigation level is selected, use the Previous and Next thumb keys to navigate at this Navigation level.

For example, if you selected the “Sentence” Navigation level, pressing the Next thumb key would move you from sentence to sentence within the book.

Alternatively, you can select the Navigation level of your choice using a quick shortcut:

1. Press Backspace + Dot 6 to access the next Navigation level OR Press Backspace + Dot 3 to access the previous Navigation level.
2. Press the Previous or Next thumb key to navigate within the book in the Navigation level selected.

Navigating by Page, Heading, Percentage, or Bookmarks in a Text Book

To reach a specific page, heading, book percentage, or bookmark:

1. Press Enter + G.
2. Scroll through the navigation options using the Previous and Next thumb keys.
3. Choose between Page, Heading, Percent, or Bookmark.
 - a. Note that the options available will vary based on the formatting available in the book.
4. Press Enter or a cursor-routing key.
5. Enter a value.
6. Press Enter or a cursor-routing key.

Auto-Scrolling Through Text in Books in the Library App

The Auto-scroll feature of the Chameleon 20 allows you to scroll through the text of an open book automatically.

To turn on Auto-scroll, press Space + Dots 1-2-4-5-6 when inside a book. Press any key to stop Auto-scroll and return to the regular Panning mode.

You can modify the Auto-scroll speed when auto-scrolling inside a book.

To slow down Auto-scroll, press Enter + Dot 3.

To speed up auto-scroll, press Enter + Dot 6.



Finding Your Current Position in a Book

Use the Where Am I command whenever you need to know your current position within a book.

To activate the Where Am I command, press Space + Dots 1-5-6.

Alternatively, access the Context menu by pressing Space + M. Go to Where Am I using the Previous and Next thumb keys, then press Enter or a cursor-routing key to activate the item.

Use the Previous and Next thumb keys to scroll through the available elements (Heading, Percent, Page, and Line). Use the Left and Right thumb keys to pan the text left and right.

Navigating to the Beginning or End of a Book

You can reach the beginning or end of a book using shortcuts.

To reach the beginning of a book, press Space + Dots 1-2-3.

To reach the end of a book, press Space + Dots 4-5-6.

Searching for Text in a Text Book

Another way to navigate within a book is to search for a specific string of text.

To search for text, press the Space + F command. You are prompted to enter the text. Type the text, then press Enter.

Accessing Additional Book Information

You can display additional information about the book you are currently reading on the device (title, author, description, date, language, subject, publisher, and bookmarks).

To display additional book information, press Space + I.

You can also press Space + M to open the Context menu. Use the Previous and Next thumb keys to select the Book Information menu item, then press Enter or a cursor-routing key to activate it.

Use the Previous and Next thumb keys to scroll through the available book information. Use the Left and Right thumb keys to pan the text left and right.

Adding, Navigating, Highlighting, and Removing Bookmarks

Bookmarks are a useful way to keep your location within the book and allow you to return quickly to that position at a later time, whether a physical position in a text book or a time position in an audiobook.

To open the Bookmark menu, press Enter + M. You can also press Space + M to open the Context menu and select Bookmark menu.

Inserting a Bookmark

To add a bookmark to a book:

1. Press Enter + M to open the Bookmark menu.
2. Select Insert Bookmark using the Previous and Next thumb keys.
3. Press Enter or a cursor-routing key.
4. Enter a specific unused bookmark number.

Note: If you do not enter a number, Chameleon selects the first available number and assigns it to the bookmark.

5. Press Enter.

Alternatively, you can insert a Quick Bookmark by pressing Enter + B.

Navigating to Bookmarks

To jump to a bookmark, press Enter + J. You are prompted to enter the bookmark number. Enter the bookmark number you wish to navigate to, then press Enter.

Highlighting Bookmarks

The Highlight Bookmarks menu item is used to define the Start and End positions of a passage. Using highlighted bookmarks is a great way to study important passages in textbooks.

To highlight bookmarks:

1. Open the Bookmark menu by pressing Enter + M.
2. Select Highlight Bookmark Start using the Previous and Next thumb keys.
3. Press Enter or a cursor-routing key.

4. Enter a specific unused bookmark number.

Note: If you do not enter a number, your Chameleon selects the first available number and assigns it to the bookmark.

5. Press Enter.

6. Navigate to the end point of the highlighted passage.

7. Open the Bookmark menu by pressing Enter + M.

8. Select Highlight Bookmark End using the Previous and Next thumb keys.

9. Press Enter or a cursor-routing key.

Note: The current position is set as the ending position. If the end position is placed before the start position, they are switched.

You can also insert a Quick Bookmark. It is used to mark the end of the Highlight Bookmark.

To insert a Quick Bookmark:

1. Press Enter + H to open the Highlight Bookmark list.

2. Select a Highlight Bookmark number.

3. Press Enter. The content of the current Highlight Bookmark will be displayed.

4. Use the thumb keys to navigate.

5. Press Space + E to close the Highlight Bookmark and return to the entire book content.

Removing Bookmarks

To remove a saved Bookmark:

1. Press Enter + M to open the Bookmark menu.

2. Scroll to Remove Bookmark using the Previous and Next thumb keys.

3. Press Enter or a cursor-routing key.

4. Enter the Bookmark number you want to remove.

5. Press Enter.

Note: If you want to remove all bookmarks type 99999 when prompted to enter a Bookmark number.



Library and Reading Commands Tables

The Library and reading commands for text books are listed in Table 4.

Table 4: Library/Reading Commands for text books

Action	Shortcut or Key Combination
Book list	Space + B
Manage books	Backspace + M
Go to Option menu	Enter + G
Bookmark menu	Enter + M
Jump to bookmark	Enter + J
Insert Quick Bookmark	Enter + B
Show Highlight Bookmarks	Enter + H
Open Navigation Level	Space + T
Previous element	Previous thumb key
Next element	Next thumb key
Change to previous Navigation level	Backspace + Dot 3
Change to next Navigation level	Backspace + Dot 6
Start Auto-scroll	Enter + Dots 1-2-4-5-6
Increase Auto-scroll speed	Enter + Dot 6
Decrease Auto-scroll speed	Enter + Dot 3
Read all (text-to-speech feature)	Space + G
Stop reading (text-to-speech feature)	Backspace + Enter
Where Am I	Space + Dots 1-5-6
Info	Space + I
Go to beginning of book	Space + Dots 1-2-3
Go to end of book	Space + Dots 4-5-6

Action	Shortcut or Key Combination
Open recent books	Enter + R
Search for books or text	Space + F
Find next	Space + N
Find previous	Space + P
Next non-blank line	Enter + Dot 4
Previous non-blank line	Enter + Dot 1
Previous character	Space + Dot 3
Next character	Space + Dot 6
Previous word	Space + Dot 2
Next word	Space + Dot 5
Previous paragraph	Space + Dots 2-3
Next paragraph	Space + Dots 5-6
Start/Stop selection	Enter + S
Select all (current paragraph)	Enter + Dots 1-2-3-4-5-6
Copy (current paragraph)	Backspace + Y
Delete book	Backspace + Dots 2-3-5-6

The Library and reading commands for audiobooks are listed in Table 5.

Table 5: Library Commands for audiobooks

Action	Shortcut or Key Combination
Book list	Space + B
Manage books	Backspace + M
Go to Option menu	Enter + G
Bookmark menu	Enter + M
Jump to bookmark	Enter + J
Insert Quick Bookmark	Enter + B

Action	Shortcut or Key Combination
Show Highlight Bookmarks	Enter + H
Open Navigation Level	Space + T
Previous element	Previous thumb key
Next element	Next thumb key
Change to previous Navigation level	Backspace + Dot 3
Change to next Navigation level	Backspace + Dot 6
Where Am I	Space + Dots 1-5-6
Info	Space + I
Go to beginning of book	Space + Dots 1-2-3
Go to end of book	Space + Dots 4-5-6
Open recent books	Enter + R
Delete book	Backspace + Dots 2-3-5-6
Play audiobook	Space + G
Stop the reading	Backspace + Enter
Fast forward 5 seconds	Right thumb key (single press)
Rewind 5 seconds	Left thumb key (single press)
Fast forward (Longer time jumps)	Right thumb key (press and hold)
Rewind (Longer time jumps)	Left thumb key (press and hold)
Increase reading speed	Enter + Dot 5
Decrease reading speed	Enter + Dot 2

Using Terminal Mode

One of the main features of the Chameleon is Terminal mode. When connected to a host device running a screen reader, such as a computer or a smart device, Terminal mode displays all text selected on the host device.

You can connect to your host device either through Bluetooth® wireless technology, or by connecting the Chameleon to the host device with the USB-C cable included in your kit. Up to five Bluetooth devices and one USB can be connected at one time.

Note that if there is a device connected to the Chameleon 20 via USB, you can have the device automatically ask if you wish to start the connection. See “Ask to open USB connection” in the **Setting User Preferences Table** for available setting options.

Connecting and Exiting Terminal Mode

To connect in Terminal mode, make sure you have a Windows®, iOS®, or Mac® device with a screen reader running.

To activate Terminal mode:

1. Press Space + Dots 1-2-3-4-5-6 or the Home button to enter the Main menu.
2. Go to Terminal mode by pressing “t” or by using the Previous and Next thumb keys.
3. Press Enter or a cursor-routing key.

To exit Terminal mode and access the list of connected devices, press the Home button once.

Determining Chameleon 20 Compatibility

The Chameleon is compatible with the following:

Screen readers: JAWS® 18+ (version 18 and newer), NVDA, SuperNova, ChromeVox (USB only), Android (USB only), and VoiceOver

Operating systems: Windows 8+, Android, macOS® 10.15+ (Catalina), or iOS device 13.4+

Waking Your iOS Device Using the Chameleon

With your iOS device locked, pressing any cursor-routing key on the Chameleon wakes it up and prompts you to enter your passcode. This



allows you to keep your iOS device in a pocket or bag while you use the Chameleon as its controller and output.

Connecting by USB

Note that steps in this section assume that the “always connect” option is not enabled. If “always connect” is enabled, you do not need to follow these steps.

To connect via USB:

1. Connect the Chameleon to a Windows or Mac computer with the USB-C cable.
2. Select Connected devices (first item in the Terminal menu).
3. Press Enter.
4. Select USB connection.
5. Press Enter.
6. Wait for the connection to be established.

If the connection is successful, the content of your host device will be shown on the braille display.

The Chameleon is now also available as an external keyboard for typing on the host device.

Connecting by Bluetooth

To pair a new device in Bluetooth:

1. From the host device, activate Bluetooth.
2. On the Chameleon, go to the Main menu.
3. Select Terminal mode and press Enter or a cursor-routing key.
4. In the Terminal menu, select Add Bluetooth Device and Press Enter.

If Bluetooth is off, it is automatically activated. Note that once Bluetooth mode is activated, your display will be in a 5-minute discoverable mode.

Note that at any time, you can press and hold the Enter key for 5 seconds to set the device in a 5-minute discoverable mode.

5. The braille display will prompt instructions on how to connect to the host device. From the host device, initiate Bluetooth-pairing with the Chameleon.

6. On the braille display, a message will prompt: “xx is connected”, where xx is the name of the host device. The focus will be directed to the list of connected devices.
7. Use the Previous and Next thumb keys to move through the list of connected devices until you reach the host device you are trying to connect with. Press Enter or a cursor-routing key to activate it.

If the connection is successful, the content of your host device will be shown on the braille display.

Navigating Between Connected Devices

When you have more than one device connected with the Chameleon, you can switch devices at any time.

To switch to another connected device, press the Home button + Next thumb key or Home button + Previous Thumb key to navigate through the list of devices.

Alternatively, you navigate to another connected device by doing the following:

1. Press the Home button to return to the list of connected devices.
2. Select the connected device using the Previous and Next thumb keys.
3. Press Enter or a cursor-routing key.

Note: When a Bluetooth device is connected, an 8-dot symbol is displayed after the device name. If the 8-dot symbol is not visible, click on the device to establish the connection.

If you have problems with a Bluetooth connection, you can click on Reconnect Devices. This turns Bluetooth off and back on and reconnects your devices. Use this option only if you are not getting any braille when connected to a device.

USB connections in Terminal Mode

When using the Chameleon in terminal mode, it is possible to either be prompted to connect with a USB connection or automatically state the connection upon inserting a USB cable from a host device.

To activate the Ask to open USB connection feature in terminal mode:

1. Go to the Main menu.
2. Select Settings and press Enter.



3. Select User Settings and press Enter.
4. Use the Previous and Next thumb keys until you reach the item Ask to open USB connection, then press Enter.
5. Use the Previous and Next thumb keys until you reach the item you require, then Press Enter.

Disable Perkins Keyboard in Terminal Mode

When using the Chameleon in terminal mode, it is possible to disable the Perkins-style keyboard to simplify your use of the device.

To disable the keyboard in terminal mode:

1. Go to the Main menu.
2. Select Settings and press Enter.
3. Select User Settings and press Enter.
4. Use the Previous and Next thumb keys until you reach the item Disable Perkins in terminal.
5. Press Enter to disable the Perkins keyboard in terminal mode; press Enter again to enable it.

Note that the Chameleon thumb keys will still be working when the Perkins keyboard is disabled.

Using the File Manager

The File Manager allows you to browse, delete, copy, and perform all the file operations you would expect from a PC file manager.

To open the File Manager, press the Next thumb key until you reach File Manager.

Alternatively, you can open the File Manager by pressing F in the Main menu, then pressing Enter or a cursor-routing key.

Browsing Files

You can browse through your files and folders using the Previous and Next thumb keys. Folder names have an 8-dot symbol in front of the folder name. Press Enter on a folder to open it.

Press Space + E to return to the parent folder. Alternatively, you can scroll to the Back item in the menu and press Enter or a cursor-routing key.



Selecting a Drive in the File Manager

Before using the File Manager, you first need to choose which drive you wish to access: the internal memory, an SD card, or a USB flash drive.

To select a drive, press Space + D to display a list of available drives. Scroll through the list using the Previous or Next thumb keys, then press Enter or a cursor-routing key to confirm your choice.

You are now at the root of your selected drive.

Press Space + D at any time to return to the Drive Selection screen.

Accessing File, Folder, or Drive Information

To get additional information on a file or folder, select it using the Previous or Next thumb keys, then press Space + I.

You can now scroll through a list of information on the file or folder using the Previous and Next thumb keys. Use the Left and Right thumb keys to pan the text left and right.

The Space + I shortcut can also be used to expose the amount of internal memory of a drive.

Displaying the Current File Path

The Where Am I function allows you to display the path of your current location on the braille display of the Chameleon.

To display your current file path, press Space + Dots 1-5-6.

Searching for Files and Folders

You can promptly access a certain file or folder by performing a search in the File Manager.

To start searching for a file or folder in the File Manager:

1. Press Space + F.
2. Type in the file or folder name.
3. Press Enter. Your Chameleon will generate a list of files and folders related to your results on the braille display.
4. Press Space + E to close the search result.

Sorting Files and Folders

By default, file and folder names are sorted alphabetically. However, you

can sort the files and folders using different parameters.

To change the sorting parameters of your files and folders:

1. Press Space + V. Your Chameleon will display a list of sorting options available: Name, Date, Size, and Type.
2. Scroll through the list using the Previous or Next thumb key.
3. Press Enter or a cursor-routing key to activate the sorting option of your choice.

Selecting the same sorting parameter already selected changes the information from ascending to descending; it changes back again when selected once more.

Modifying Files and Folders

The File Manager on the Chameleon lets you work with files similarly to a computer or tablet.

Creating a New Folder

The File Manager lets you create new folders.

The simplest way to do this is by pressing Space + N and entering the name of the new folder in the blank field. Then, press Enter to create it.

Renaming Files and Folders

To rename a file or folder:

1. Select the file or folder you wish to rename using the Previous and Next thumb keys.
2. Press Backspace + R.
3. Enter the new file or folder name.
4. Press Enter to rename the file or folder.

Note: The file name must be unique in your current directory, and only one file or folder can be renamed at a time.

Selecting Files and Folders for Applying Additional Actions

Before you can perform an action on a file or folder, such as cut, copy, or paste, you must first select (or mark) the desired file or folder.

To mark a file or folder, select the file using the Previous or Next thumb keys, then press Backspace + L.



To unmark a file or folder, select it and press Backspace + L again.

To mark all files and folders in the current directory, press Enter + Dots 1-2-3-4-5-6.

Copying, Cutting, and Pasting Files or Folders

Copying and Cutting Files and Folders

To copy a single file or folder, select the file using the Previous or Next thumb keys, then press Backspace + Y.

To cut a single file or folder, select the file using the Previous or Next thumb keys, then press Backspace + X.

To copy or cut multiple files or folders:

1. Select the file or folder to copy using the Previous or Next thumb keys.
2. Press Backspace + L to mark the file or folder.
3. Repeat this step to mark all files or folders to be copied.
4. Press Backspace + Y to copy **OR** Backspace + X to cut.

The files or folders are now copied/cut to the clipboard and ready to be pasted.

Pasting Files and Folders

To paste the copied or cut files or folders, navigate to the desired location, then press Backspace + V.

Deleting Files or Folders

To delete a single file or folder, select the file using the Previous or Next thumb keys, then press Backspace + Dots 2-3-5-6.

To delete multiple files or folders:

1. Select the file or folder you wish to delete using the Previous or Next thumb keys.
2. Once selected, press Backspace + L to mark the file or folder.
3. Repeat this step to mark all files or folders you wish to delete.
4. When ready to delete the marked files or folders, press Backspace + Dots 2-3-5-6.

Note: Chameleon asks if you are sure you want to delete the files and/or folders **only** when Confirm Deletion has been set to on in the Settings

menu. Select Yes using the Previous or Next keys, and press Enter or a cursor-routing key to confirm the deletion. For more information on the Confirm Deletion setting, go to the [Setting User Preferences section](#).

File Manager Commands Table

The File Manager commands are listed in Table 6.

Table 6: File Manager Commands

Action	Shortcut or Key Combination
Create new folder	Space + N
File/drive info	Space + I
Mark/Unmark	Backspace + L
Mark all/Unmark all	Enter + Dots 1-2-3-4-5-6
Rename file	Backspace + R
Delete file	Backspace + Dots 2-3-5-6
Copy file	Backspace + Y
Cut file	Backspace + X
Paste file	Backspace + V
Search file	Space + F
Sort files	Space + V
Where Am I	Space + Dots 1-5-6
Select drive	Space + D
Go to parent folder	Space + E
Eject media	Backspace + E

Using the Calculator Application

The Chameleon features a calculator app that enables you to perform the most common operations.

Note: The Calculator currently supports computer braille only.

To open the Calculator:



1. Go to the Main menu.
2. Press C or press the Previous or Next thumb keys until you reach the Calculator menu item.
3. Press Enter or a cursor-routing key.

Operating the Calculator

To use the Calculator, write your complete equation, then press Enter to get the result.

For example, type the equation $20-(6+8)$ (with no spaces). Press Enter and Chameleon will display 6 as the answer.

To clear the previous equation, press Space + Dots 3-5-6.

To add operators such as + or -, open the Context menu using Space + M. Refer to Table 7 for a full list of Calculator commands and operators.

Calculator Commands Table

The Calculator commands are listed in Table 7.

Table 7: Calculator Commands Using US Computer Braille

Action	Shortcut or Key Combination
Plus	Dots 3-4-6
Minus	Dots 3-6
Multiply	Dots 1-6
Divide	Dots 3-4
Equals	Enter
Clear	Space + Dots 3-5-6
Decimal point	Dots 4-6
Percent	Dots 1-4-6
Square root	Space + Dots 3-4-5
Pi	Space + Y

Using the Date and Time Application

The Chameleon features an application that gives you the current date and time.

To open Date and Time:

1. Go to the Main menu.
2. Press the Previous or Next thumb keys until you reach the Date and Time menu item.
3. Press Enter or a cursor-routing key.

Displaying the Time and Date

When you open the Date and Time application, Chameleon displays the current time.

Pan right once using the Right thumb key to display the date.

Pan left using the Left thumb key to return to the time.

To quickly review the date and time, press Enter + T for the time and Enter + D for date from anywhere on the Chameleon.

Setting the Time and Date

To change the time and date, press Space + M from the Date and Time application.

A submenu opens with the following options:

Change time: Type the current hour inside the square brackets, press Enter; repeat for the minutes.

Change date: Type the current year inside the square brackets and press Enter; repeat for the month and day.

Daylight Saving Time: Press Enter to turn Daylight Saving Time on or off.

Time format: Press Enter to change between 24h and 12h time format.

Date format: Select the preferred date format (listed below) and press Enter.

- Language Default
- Day, Month, Year
- Month, Day
- Month, Day, Year
- Year, Month, Day
- Day, Month

Setting User Preferences

To open the Settings menu, press the Next thumb key until you reach Settings or press ‘S’ in the Main menu, then press Enter or a cursor-routing key.

User Setting Options Table

The Setting options are listed in Table 8.

Table 8: Settings Operations

Setting	Option/Result
Airplane mode	On or off; when on, all wireless functionalities are disabled
Format markers	On or off; when off, format markers are hidden
Cursor visible	On or off
Cursor blink	On or off; when on, the cursor will blink at a rate of 0.5 seconds.
Message display time	1–30 seconds: time of message displayed
Sleep time	Number in minutes; 0 to turn off
Word wrap	On or off
Condense blank lines	On or off; when on, blank lines are not visible
Confirm deletion	On or off; when on, Chameleon asks for confirmation of file deletion
Vibration	On or off; when on, Chameleon vibrates
Beep	On or off; when on, Chameleon beeps
Thumb keys configuration	Map the previous item, next item, pan left, and pan right commands to the thumb key of your choice.

Setting	Option/Result
Wireless notifications	Enable or disable wireless and Bluetooth connection feedback
One-handed mode	On or off; when on, dots keys can be pressed and released one-by-one, the dot combination is only confirmed once the Space key is pressed
Start in terminal	On or off; when on, the device will automatically start in the Terminal menu upon restarting
Ask to open USB connection	<p>When connecting the device to a PC with a USB cable, there are three possible outcomes depending on the selection of Ask to open USB connection in the user settings</p> <ol style="list-style-type: none"> 1. If “never ask” is selected, nothing happens 2. If “ask for connection” is selected, the user will be asked if they want to open the connection 3. If “always connect” is selected, the device will automatically connect to the PC
Disable Perkins in terminal	On or off; when On, the Perkins-style keyboard will be disabled when the device is used in terminal mode

Adding, Configuring, and Deleting Language Profiles

The Language Profile menu lists all the available language profiles on your Chameleon. The active language profile is underlined with Dots 7 and 8 on the device. Creating multiple language profiles can allow you to easily switch quickly between braille tables and voices.

Scroll through the available language profiles using the Next and Previous thumb keys, then press Enter or a cursor-routing key to select it.

Adding a Language Profile

To add a Language Profile, select Add Language Profiles, then press Enter or a cursor-routing key.

You will be prompted to enter the following options:

Profile name: Type the name for the profile in the brackets, then press Enter.

Braille grade: Choose between Uncontracted, Contracted, and Computer Braille, then press Enter. Note that the Chameleon allows you to hide contracted braille and/or computer braille when toggling between the braille grades.

Computer braille table: Select your computer braille table, then press Enter. Select None to not have to cycle through computer braille when using the braille grade toggle.

Uncontracted braille table: Select your uncontracted braille table, then press Enter.

Contracted braille table: Select your contracted braille table, then press Enter. Select None to not have to cycle through contracted braille when using the braille grade toggle.

Content Voice: Select the content voice of your choice, then press Enter. Select None to turn the Content voice off. Voices available depend on your selection for the System voice and additional voice, which can be changed from Voice selection within the Speech settings.

Save configuration: Press Enter to save your configuration.

The new language profile is now available in the Language Profile Settings menu.

Configuring or Deleting a Language Profile

To configure or delete a language profile:

1. In the Settings menu, select the item Language Profile.
2. Scroll through the available language profiles using the Next and Previous thumb keys.
3. Press Space + M to open the Context menu.
4. Select Configure Language Profile or Delete Language Profile and press Enter.
5. Alternatively, Configure profile and Delete profile can be selected in the Language profile menu.

Text-to-speech

The Chameleon 20 allows for the text that appears on the braille display to be heard via a text-to-speech (TTS) feature, which will adapt to the system language chosen.

Note that default, the device only supports TTS for English and Latin American languages. If you have English or Latin American selected as your language, then TTS will be activated. If an alternative language is chose, then you will be prompted to download that language upon having an active network connection.

To activate/deactivate the text-to-speech feature:

1. In the Settings menu, select the item Speech Settings and press Enter.
2. Use the Previous and Next thumb keys until you reach the Speech settings.
3. Press Enter to toggle the Speech setting On or Off.

Alternatively, you can use the Space + Previous Thumb Key shortcut to toggle the Speech feature On or Off.

While editing text in the Editor application or reading a document in the Library application, you can press Space + G, which will start reading the text from the current position. Use the Backspace + Enter shortcut to stop reading.

Note: When using the Braille editor application, TTS will not be available.

Voice Selection

While navigating the device, you can select a menu voice that will be used to read menus, system messages and content. If you wish to use an alternative voice for your content reading, you can do so by selecting the change additional voice item. Your content voice can then later be changed within the language profiles.

Change Menu Voice

1. In the Settings menu, select Speech Settings and press Enter.
2. Use the Previous and Next thumb keys until you reach the download language and voices selection item and press Enter. A submenu will appear.
3. Choose Change Menu Voice (current voice will be specified) and press Enter.
4. Select the variant of your system language (for example, English North America) that you want if more than one is available.
5. A list of available voices will appear. Choose a voice from the list and press Enter.
6. Any changes to the voices will require a restart of the device.

Change an Additional Voice

1. In the Settings menu, select the item Speech Settings and press Enter.
2. Use the Previous and Next thumb keys until you reach the download language and voices selection item and press Enter. A submenu will appear.
3. Choose Change Additional Voice (current voice will be specified) and press enter.
4. Select the desired language, then the language variant (for example, French Canada) that you want, if more than one is available.
5. A list of available voices will appear. Choose a voice from the list and press Enter.

Any changes to the voices will require a restart of the devices.

For information about selecting a Content voice, which will read content in the Editor and Library applications, please see the section Adding, Configuring, and Deleting Language Profiles.



Speech Settings Table

The available Speech Settings are listed in Table 9.

Table 9: Speech Settings

Setting	Option/Result
Speech	On or off; when off, all speech features are disabled.
Speak menu	On or off; when off, all speech features are disabled while navigating in the menus, but stay enabled in the applications.
Speak word under cursor	On or off; when on, the user can press on a cursor routing key and the word below the key will be read.
Speak display content after panning	On or off; when on, the speech feature will read the remainder of a line when the user pans it on the braille display.
Echo delete	On or off; when on, the device will speak the characters deleted with the Backspace key.
Keyboard echo	Words, Characters, Characters and Words or Off; the item chosen determines what will be spoken when typing on the keyboard.
Download language and voices	Change menu voice, change additional voice, swap voices

Using a Wi-Fi Network or Bluetooth

Chameleon 20 features 2.4 GHz Wi-Fi capabilities.

Connecting to a Wi-Fi Network

Select New Connection from the Wi-Fi menu, then press Enter or a cursor-routing key to access it. You can also use the global shortcut to access the Wi-Fi search (note that if airplane mode is enabled, it will disallow access).

There are three connection choices:

Scan for SSID: Select this option to discover the available networks in your vicinity. When Chameleon is done scanning, it will display a list of all the networks it found.

Press Enter or a cursor-routing key to select this network. Then enter the password and press Enter to complete the connection.

WPS Connection: Select this option to establish a Wi-Fi connection using WPS. The Chameleon displays “Loading...” for approximately 30 seconds. Press the WPS button on your network router to turn on discovery of new devices. After a few seconds, you will be automatically connected to the network.

Manually Connect: To enter the SSID of your network and the password manually, select this option. When done, press Enter to connect.

Wi-Fi Settings Table

The available Wi-Fi Settings are listed in Table 10.

Table 10: Wi-Fi Settings

Setting	Option/Result
Wi-Fi	Press Enter to turn Wi-Fi on or off
Status	Provides information about your current Wi-Fi status
New connection	Press Enter to create a new Wi-Fi connection
Launch connection	Connect to a Wi-Fi network known by your device
Delete connection	Make your device forget a known Wi-Fi network
Network settings	Change advanced network settings, such as Mode, IP, Subnet Mask, Gateway, and DNS
Import Wi-Fi	Import Wi-Fi network information from a file

Choosing Bluetooth Mode Options

The following Bluetooth mode options are available on the Chameleon 20.

Bluetooth mode: On or Off

Connect device: Connect the Chameleon to a paired Bluetooth device

Disconnect device: Disconnect the active Bluetooth connection

Delete paired device: Makes your device forget a Bluetooth device

One-Handed Mode

The Chameleon can be used in a one-handed mode that allows entering shortcuts with only one hand. When the one-handed mode is activated, the way that Braille input and commands are performed changes. Each key can be pressed and released one by one, and the dot combination is only confirmed once the space key is pressed.

To insert a blank space between words, press the space bar twice.

To perform braille commands, the same logic is used for the input of characters. For Braille commands that involve the space bar, such as the Go to top (Space with dots 1,2,3) command, an additional space bar press is required.

For example, to perform the Go to top command (standard command is space with dots 1,2,3): press space, then dot 1, then dot 2, then dot 3, then space.

Note: the operation of the thumb keys and cursor-routing keys remains the same as with the standard two-handed mode.

To activate/deactivate the one-handed mode:

1. Go to the Main menu.
2. Select Settings and press Enter.
3. Select User Settings and press Enter.
4. Use the Previous and Next thumb keys until you reach the One-handed mode item.
5. Press Enter to activate the One-handed mode; press Enter again to deactivate it.

Change Language

To change the system language of the Chameleon 20:

1. Go to the Main menu.
2. Select Settings.
3. Select Change Language.
4. Select the Language option and press Enter. A list will appear on the display.
5. Select the language of your choice from the list. (Spanish or English are the only available languages)
6. Select Close.
7. You will be prompted to select the option Replace Language default profile. If you click on Ok, a new Language profile will be created with a Braille table allowing to read Braille menus in the selected language. Press Cancel if you wish to stay with your current Language profile.
8. When prompted, reboot the Chameleon to apply the changes.

Accessing and Using Online Services

This Online Services menu contains online libraries included on your Chameleon. The online services are subscription-based and require you to enter your account credentials.

Note: Make sure you have an established internet connection with the Chameleon before using online services.

Books from online libraries are downloaded to the Chameleon's Online-Books folder. All books are included in Library application's main book list of the Library application.

Activating Bookshare and Downloading Books

The Bookshare® online library contains copyrighted content for people with qualifying print disabilities. More information about Bookshare is available from <http://www.bookshare.org>.

You can search for books and download them to the Chameleon wirelessly. Newspapers and magazines are currently not available in the online library.

To activate the Bookshare service and download a book:

1. Enter your Bookshare account email address and password.
2. Select your preferred book format (DAISY or BRF).
3. Search books by title, author, full-text search, and category. You can also search for the most recent or popular books.
4. Press Enter or a cursor-routing key on a book to get more information.
5. Use the Previous and Next thumb keys to navigate between the title, author, and book description.
6. Select the book of your choice and press Enter to download it to the Chameleon.

Configuring, Managing, and Syncing an NFB Newsline Account

If you have an NFB Newsline® account, the Chameleon allows you to connect to your account and download NFB material for reading in the Library.

Configure account: Enter your NFB Newsline credentials, select the issue update frequency, and determine whether your Chameleon should keep or delete outdated issues.

Manage publications: Select which material you wish to subscribe to. Subscribed material is underlined.

Sync content now: Syncing downloads the latest issues of your subscribed material.

NLS Bard

The Chameleon 20 can access BARD directly. You can view and download books from the most popular books list and the most recent books and magazines list. You can browse subject categories and search the collection. You can also download books and magazines from your wish list as well as add and remove items from it. Before you can access BARD, you must connect your device to a Wi-Fi network (see “[Connecting to a Wi-Fi Network](#)” for detailed instructions) and login to your BARD account.

Exam Mode

Exam mode is used to block certain functions and applications from the Chameleon for a certain amount of time. While Exam mode is active, you will have access to the Terminal functions only. Note that in Exam Mode, the Bluetooth connection is deactivated and Terminal mode is accessible only via USB. All other applications and the use of an external memory (USB drive or SD card) are blocked while this mode is active.

When activating Exam mode, you will be prompted to enter a time between 1 and 360 minutes (6 hours) and will be asked to enter a desired password to turn off Exam mode. To unlock the device, you will need to either wait for the selected time to run out or enter the selected password.

Upon restarting the device, if the period selected is not completed yet, the device will automatically go back to Exam mode.

To activate Exam mode:

1. Go to the Main menu.
2. Select Settings.
3. Press Enter.
4. Go to Activate Exam Mode.
5. Press Enter.
6. Enter the desired time (between 1 and 360 minutes).
7. Enter the desired password to activate the exam mode.
8. Press Enter.

Updating the Chameleon 20

Updating the Chameleon 20 manually

When connected to the Internet with the Chameleon, you can manually check if an update is available.

To check for an update manually:

1. Go to the Main menu.
2. Select Settings.
3. Press Enter.
4. Select Software Update.
5. Press Enter.
6. Select Check for Update.
7. Press Enter.

If prompted with a new update, select Download by pressing the Previous or Next thumb key to download the update now or choose Remind Me Later to update it later. You can continue to use the Chameleon while the update is downloading.

Note that the device must be plugged in and the battery must be more than 50% charged for the update to be performed.

After a few minutes, Chameleon will ask you to install the downloaded update. Select OK to install it. The Chameleon will reboot and a progress indicator line will be shown on the braille display.

At the end of the update process, all 8 dots of the 20 braille cells will raise one column at a time and then the device will shut down.



Updating the Chameleon 20 via USB or SD Card

You can update the Chameleon by downloading the update file on a computer and transferring it to a USB flash drive or an SD card. To update the Chameleon via USB or an SD card:

1. Insert a USB flash drive or SD card into your computer.
2. Transfer the update file to the USB flash drive or SD card. Note that the update file must be placed at the root of the USB drive/SD card.
3. Insert the USB flash drive or SD card containing the update file into your Chameleon. Make sure your Chameleon is powered on.
4. When the Chameleon detects an update file on the USB drive or SD card, the braille display will notify you that an update is available for installation.
5. Press the Next thumb key until you reach OK, then press Enter to activate the update. The device will shut down and restart to process the update.

The latest update is always available on the [Chameleon 20 Product Page](#).

Automatic Check for Update Feature

By default, an Automatic Check for Update feature is enabled. When connected to the internet, the Chameleon regularly checks if a new update is available for download. If an update is available, the Chameleon will prompt you to download it.

To disable/enable the Automatic Check for Update feature, follow these steps:

1. Go to the Main menu.
2. Select Settings.
3. Press Enter.
4. Go to Software Update.
5. Press Enter.
6. Select Automatic Check for Updates.
7. Press Enter to enable/disable the feature.

Note that when enabled, the Chameleon will check every 23 hours if a new update is available.

Customer Support

For customer support, please contact APH Customer Service at 800-223-1839 or cs@aph.org.

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End User License Agreement

By using this Product (Chameleon 20), you agree to the following minimum terms:

1. **License Grant** HumanWare grants to End User a non-exclusive, non-transferable right and licence to use the Software on this product.
2. **Ownership of Software** End User acknowledges that HumanWare retain all right, title and interest in and to the original, and any copies, of software which is incorporated into this product. End User agrees not to: modify, port, translate, decompile, disassemble, reverse engineer, or make public in any way the software of this Product.

Warranty

Manufacturer Warranty

This device is a high-quality product, built and packaged with care. All units and components are guaranteed against any operational defects, as follows:

US and Canada: One (1) year

Warranty covers all parts (except battery) and labor. If any defect should occur, please contact your local distributor or the manufacturer's technical assistance line.

Note: Warranty terms may periodically change; please consult our website for the latest information.

Conditions and Limitations:

No replacement or repair covered by the warranty will be carried out unless the unit is accompanied by a copy of the original bill of purchase. Please retain your original. If the unit must be returned, please use the original packaging. This warranty applies to all cases where the damage is not a result of improper use, mistreatment, negligence, or acts of God.

Extended Warranty

Extended warranties are available through APH. Please contact APH Customer Service at cs@aph.org, or 1-800-223-1839 to discuss warranty options.

Appendix A—Command Summary

Shortcut/Key Combination Table

Action	Shortcut or Key Combination
Activate selected item	Enter or cursor-routing key
Esc or Back	Space + E
Previous item	Previous thumb key or Space + Dot 1
Next item	Next thumb key or Space + Dot 4
Jump to any item in a list	Type the first letter of the item or app
Pan left and right	Left or Right thumb key
Go to top	Space + Dots 1-2-3
Go to bottom	Space + Dots 4-5-6
Toggle braille grade	Backspace + G
Switch language profile	Enter + L
Battery level	Enter + P
Context menu	Space + M
Main menu	Space + Dots 1-2-3-4-5-6 or Home button
System information	Space + I
Time	Enter + T
Date	Enter + D
Eject media	Enter + E
Create a Quick Note	Backspace + N
Create a quick braille note	Backspace + B

Action	Shortcut or Key Combination
Toggle speech on/off	Space + Previous Thumb Key
Increase speech rate	Enter + Dot 5
Decrease speech rate	Enter + Dot 2
Search for Wi-Fi	Backspace + Enter + S

Editor Commands

Action	Shortcut or Key Combination
Activate edit mode	Enter or a cursor-routing key
Leave edit mode	Space + E
Create file	Backspace + N
Open file	Backspace + O
Save	Space + S
Save as	Backspace + S
Find	Space + F
Find next	Space + N
Find previous	Space + P
Replace	Backspace + F
Start/Stop selection	Enter + S
Select all	Enter + A
Copy	Backspace + Y
Cut	Backspace + X
Paste	Backspace + V
Delete previous word	Backspace + Dot 2

Action	Shortcut or Key Combination
Delete current word	Backspace + Dots 2-5
Delete previous character	Backspace
Move to next edit box while editing	Enter
Move to next edit box without editing	Next thumb key
Move to previous edit box without editing	Previous thumb key
Move insertion point to start of text-field document	Space + Dots 1-2-3
Move insertion point to end of text-field document	Space + Dots 4-5-6
Start auto-scroll	Space + Dots 1-2-4-5-6
Increase auto-scroll speed	Enter + Dot 6
Decrease auto-scroll speed	Enter + Dot 3
Read all (text-to-speech feature)	Space + G
Stop the text-to-speech	Backspace + Enter
Toggle Reading mode	Space + X
Bookmark menu	Enter + M
Jump to bookmark	Enter + J
Insert Quick Bookmark	Enter + B

Braille Editor Commands

Action	Shortcut or Key Combination
Activate Edit mode	Enter or a cursor-routing key
Leave Edit mode	Space + E
Create file	Backspace + N
Open file	Backspace + O
Save	Space + S
Save as	Backspace + S
Find	Space + F
Find next	Space + N
Find previous	Space + P
Replace	Backspace + F
Start/stop selection	Enter + S
Select all	Enter + A
Copy	Backspace + Y
Cut	Backspace + X
Paste	Backspace + V
Delete previous word	Backspace + Dot 2
Delete current word	Backspace + Dots 2-5
Delete previous character	Backspace
Move to next edit box while editing	Enter
Move to next edit box without editing	Next thumb key

Action	Shortcut or Key Combination
Move to previous edit box without editing	Previous thumb key
Move insertion point to start of text field document	Space + Dots 1-2-3
Move insertion point to end of text field document	Space + Dots 4-5-6
Start auto-scroll	Space + Dots 1-2-4-5-6
Increase auto-scroll speed	Enter + Dot 6
Decrease auto-scroll speed	Enter + Dot 3
Toggle Reading mode	Space + X
Bookmark menu	Enter + M
Jump to bookmark	Enter + J
Insert Bookmark	Enter + B

Library/Reading Commands for text books

Action	Shortcut or Key Combination
Book list	Space + B
Manage books	Backspace + M
Go to Option menu	Enter + G
Bookmark menu	Enter + M
Jump to bookmark	Enter + J
Insert Quick Bookmark	Enter + B
Show Highlight Bookmarks	Enter + H
Open navigation level	Space + T

Action	Shortcut or Key Combination
Previous Navigation level	Backspace + Dot 3
Next Navigation level	Backspace + Dot 6
Previous element	Previous thumb key
Next element	Next thumb key
Start Auto-Scroll	Enter + Dots 1-2-4-5-6
Increase Auto-Scroll speed	Enter + Dot 6
Decrease Auto-Scroll speed	Enter + Dot 3
Read all (text-to-speech feature)	Space + G
Stop reading (text-to-speech feature)	Backspace + Enter
Where Am I	Space + Dots 1-5-6
Info	Space + I
Go to beginning of book	Space + Dots 1-2-3
Go to end of book	Space + Dots 4-5-6
Open recent books	Enter + R
Search for books or text	Space + F
Find next	Space + N
Find previous	Space + P
Next non-blank line	Enter + Dot 4
Previous non-blank line	Enter + Dot 1
Previous character	Space + Dot 3
Next character	Space + Dot 6

Action	Shortcut or Key Combination
Previous word	Space + Dot 2
Next word	Space + Dot 5
Previous paragraph	Space + Dots 2-3
Next paragraph	Space + Dots 5-6
Start/Stop selection	Enter + S
Select all (current paragraph)	Enter + Dots 1-2-3-4-5-6
Copy (current paragraph)	Backspace + Y
Delete book	Backspace + Dots 2-3-5-6

Library Commands for audiobooks

Action	Shortcut or Key Combination
Book list	Space + B
Manage books	Backspace + M
Go to Option menu	Enter + G
Bookmark menu	Enter + M
Jump to bookmark	Enter + J
Insert Quick Bookmark	Enter + B
Show Highlight Bookmarks	Enter + H
Open Navigation Level	Space + T
Previous element	Previous thumb key
Next element	Next thumb key
Change to previous Navigation level	Backspace + Dot 3
Change to next Navigation level	Backspace + Dot 6
Where Am I	Space + Dots 1-5-6

Action	Shortcut or Key Combination
Info	Space + I
Go to beginning of book	Space + Dots 1-2-3
Go to end of book	Space + Dots 4-5-6
Open recent books	Enter + R
Delete book	Backspace + Dots 2-3-5-6
Play audiobook	Space + G
Stop the reading	Backspace + Enter
Fast forward 5 seconds	Right thumb key (single press)
Rewind 5 seconds	Left thumb key (single press)
Fast forward (Longer time jumps)	Right thumb key (press and hold)
Rewind (Longer time jumps)	Left thumb key (press and hold)
Increase reading speed	Enter + Dot 5
Decrease reading speed	Enter + Dot 2

File Manager Commands

Action	Shortcut or Key Combination
Create new folder	Space + N
File/drive info	Space + I
Mark/Unmark	Backspace + L
Mark all/Unmark all	Enter + Dots 1-2-3-4-5-6
Rename file	Backspace + R
Delete file	Backspace + Dots 2-3-5-6
Copy file	Backspace + Y
Cut file	Backspace + X

Action	Shortcut or Key Combination
Paste file	Backspace + V
Search file	Space + F
Sort files	Space + V
Where Am I	Space + Dots 1-5-6
Select drive	Space + D
Go to parent folder	Space + E
Eject media	Backspace + E

Calculator Commands Using US Computer Braille

Action	Shortcut or Key Combination
Plus	Dots 3-4-6
Minus	Dots 3-6
Multiply	Dots 1-6
Divide	Dots 3-4
Equals	Enter
Clear	Space + Dots 3-5-6
Decimal point	Dots 4-6
Percent	Dots 1-4-6
Square root	Space + Dots 3-4-5
Pi	Space + Y

Appendix B—Braille Tables

United States 8-Dot Computer Braille

exclamation mark: ‘!’ 2,3,4,6

quote: “” 5

pound: ‘#’ 3,4,5,6

dollar sign: ‘\$’ 1,2,4,6

percent: ‘%’ 1,4,6

ampersand: ‘&’ 1,2,3,4,6

apostrophe: ‘’ 3

left paren: ‘(’ 1,2,3,5,6

right paren: ‘)’ 2,3,4,5,6

asterisk: ‘*’ 1,6

plus sign: ‘+’ 3,4,6

comma: ‘,’ 6

dash: ‘-’ 3,6

period: ‘.’ 4,6

forward slash: ‘/’ 3,4

colon: ‘:’ 1,5,6

semi-colon: ‘;’ 5,6

less than: ‘<’ 1,2,6

equals: ‘=’ 1,2,3,4,5,6

greater than: ‘>’ 3,4,5

question mark: ‘?’ 1,4,5,6

at symbol: ‘@’ 4,7

left square bracket: ‘[’ 2,4,6,7

back slash: ‘\’ 1,2,5,6,7

right square bracket: ‘]’ 1,2,4,5,6,7

carat sign: ‘^’ 4,5,7

underscore: ‘_’ 4,5,6

grave accent: ‘`’ 4

left curly bracket: ‘{’ 2,4,6

vertical bar: ‘|’ 1,2,5,6

right curly bracket: ‘}’ 1,2,4,5,6

tilde: ‘~’ 4,5

‘0’: 3,5,6

‘1’: 2

‘2’: 2,3

‘3’: 2,5

‘4’: 2,5,6

‘5’: 2,6

‘6’: 2,3,5

‘7’: 2,3,5,6

‘8’: 2,3,6

‘9’: 3,5

Uppercase letters:

‘A’: 1,7

‘B’: 1,2,7

‘C’: 1,4,7

‘D’: 1,4,5,7

‘E’: 1,5,7

‘F’: 1,2,4,7

‘G’: 1,2,4,5,7

‘H’: 1,2,5,7

‘I’: 2,4,7

‘J’: 2,4,5,7

‘K’: 1,3,7

‘L’: 1,2,3,7

‘M’: 1,3,4,7

‘N’: 1,3,4,5,7

‘O’: 1,3,5,7
‘P’: 1,2,3,4,7
‘Q’: 1,2,3,4,5,7
‘R’: 1,2,3,5,7
‘S’: 2,3,4,7
‘T’: 2,3,4,5,7
‘U’: 1,3,6,7
‘V’: 1,2,3,6,7
‘W’: 2,4,5,6,7
‘X’: 1,3,4,6,7
‘Y’: 1,3,4,5,6,7
‘Z’: 1,3,5,6,7

Lowercase letters:

‘a’: 1
‘b’: 1,2
‘c’: 1,4
‘d’: 1,4,5
‘e’: 1,5
‘f’: 1,2,4
‘g’: 1,2,4,5
‘h’: 1,2,5
‘i’: 2,4
‘j’: 2,4,5
‘k’: 1,3
‘l’: 1,2,3
‘m’: 1,3,4
‘n’: 1,3,4,5
‘o’: 1,3,5
‘p’: 1,2,3,4
‘q’: 1,2,3,4,5

‘r’: 1,2,3,5

‘s’: 2,3,4

‘t’: 2,3,4,5

‘u’: 1,3,6

‘v’: 1,2,3,6

‘w’: 2,4,5,6

‘x’: 1,3,4,6

‘y’: 1,3,4,5,6

‘z’: 1,3,5,6

United Kingdom 8-Dot Computer Braille

exclamation mark: ‘!’: 2,3,4,6

quote: “” 4

pound: ‘#’ 5,6

dollar sign: ‘\$’ 4,5,6

percent: ‘%’ 4,6

ampersand: ‘&’ 1,2,3,4,6

apostrophe: ‘’ 3

left paren: ‘(’ 4,5

right paren: ‘)’ 3,4,5

asterisk: ‘*’ 3,5

plus sign: ‘+’ 2,3,5

comma: ‘,’ 2

dash: ‘-’ 3,6

period: ‘.’ 2,5,6

forward slash: ‘/’ 3,4

colon: ‘:’ 2,5

semi-colon: ‘;’ 2,3

less than: ‘<’ 2,3,6

equals: ‘=’ 2,3,5,6

greater than: ‘>’ 3,5,6



question mark: '?' 2,6
at symbol: '@' 2,3,4,6,7
left square bracket: '[' 1,2,3,5,6,7
back slash: '\' 5,7
right square bracket: ']' 2,3,4,5,6,7
carat sign: '^' 6,7
underscore: '_' 3,4,6
grave accent: '`' 2,3,4,6
left curly bracket: '{' 1,2,3,5,6
vertical bar: '|' 5
right curly bracket: '}' 2,3,4,5,6
tilde: '~' 6
Pounds sterling: '£' 2,3,6,7,8
degree sign: '°' 1,3,4,6,8
'0': 1,2,3,4,5,6
'1': 1,6
'2': 1,2,6
'3': 1,4,6
'4': 1,4,5,6
'5': 1,5,6
'6': 1,2,4,6
'7': 1,2,4,5,6
'8': 1,2,5,6
'9': 2,4,6

Uppercase letters:

'A': 1,7
'B': 1,2,7
'C': 1,4,7
'D': 1,4,5,7
'E': 1,5,7



‘F’: 1,2,4,7
‘G’: 1,2,4,5,7
‘H’: 1,2,5,7
‘I’: 2,4,7
‘J’: 2,4,5,7
‘K’: 1,3,7
‘L’: 1,2,3,7
‘M’: 1,3,4,7
‘N’: 1,3,4,5,7
‘O’: 1,3,5,7
‘P’: 1,2,3,4,7
‘Q’: 1,2,3,4,5,7
‘R’: 1,2,3,5,7
‘S’: 2,3,4,7
‘T’: 2,3,4,5,7
‘U’: 1,3,6,7
‘V’: 1,2,3,6,7
‘W’: 2,4,5,6,7
‘X’: 1,3,4,6,7
‘Y’: 1,3,4,5,6,7
‘Z’: 1,3,5,6,7

Lowercase letters:

‘a’: 1
‘b’: 1,2
‘c’: 1,4
‘d’: 1,4,5
‘e’: 1,5
‘f’: 1,2,4
‘g’: 1,2,4,5
‘h’: 1,2,5

‘i’: 2,4

‘j’: 2,4,5

‘k’: 1,3

‘l’: 1,2,3

‘m’: 1,3,4

‘n’: 1,3,4,5

‘o’: 1,3,5

‘p’: 1,2,3,4

‘q’: 1,2,3,4,5

‘r’: 1,2,3,5

‘s’: 2,3,4

‘t’: 2,3,4,5

‘u’: 1,3,6

‘v’: 1,2,3,6

‘w’: 2,4,5,6

‘x’: 1,3,4,6

‘y’: 1,3,4,5,6

‘z’: 1,3,5,6



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