Welcome to PocketC.H.I.P.

Hey! Thanks for checking out **PocketC.H.I.P.**!

PocketC.H.I.P. is a game console, a portable synthesizer, and a Linux field terminal. With a bit of effort, it can become a whole lot more – see PockulusC.H.I.P., PocketC.H.I.P. as a VR headset here.

The point is, **PocketC.H.I.P. can be what you want it to be** and we're excited to see what you will do with your PocketC.H.I.P..

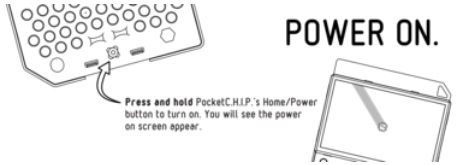
These are the **Docs**, which are intended to help you get started with PocketC.H.I.P.. The Docs will introduce you to the software that comes pre-installed on PocketC.H.I.P., explain how to use the system, and hopefully plant some ideas about how you can do even more with your PocketC.H.I.P..

The Docs will *not* teach you how to code (though it will give tips), how to program a game (though it will explain the tools), how to make music (though it will describe options), or how to build onto PocketC.H.I.P. (though it be encouraged).

Have fun!

Quick Start

This section explains how to **turn on PocketC.H.I.P.**, **setup WiFi**, and **charge your device**.

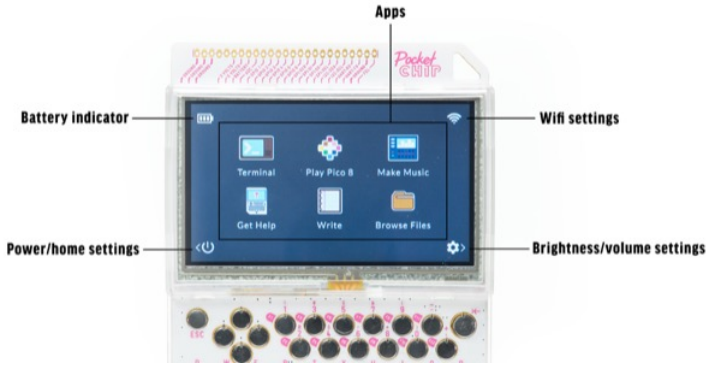


Turn on PocketC.H.I.P. by pressing down the **Home/Power button** located at the bottom in the middle of the keyboard for about **two seconds**.

PocketC.H.I.P. will take a moment to fully load, but while it does you will see the C.H.I.P. logo and then a PocketC.H.I.P. splash screen.

Once PocketC.H.I.P. is ready you will see a series of slides showing the PocketC.H.I.P. basics. Use the **right arrow key** or **tap the right side of the screen** to advance forward in the slideshow.

Once you have clicked through the basics, you will see a screen with six icons. This is the **Home Screen**.



Use a **finger** or **stylus** (or really anything that's solid and isn't sharp) to tap on the application you want to use. Press gently enough to make contact with the screen. There's no need to apply a lot of force. A gentle touch will do.

While using an application, **press the Home/Power button to return to the Home Screen**.

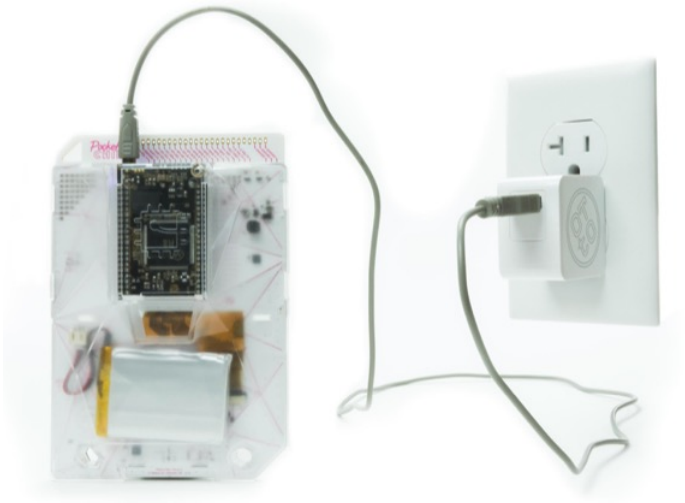
WIFI SETUP

From the Home Screen, tap the **settings icon** in the bottom right corner to access the Settings Screen.

Press the button to the right of the WiFi toggle switch to open a menu of all the networks in range. Scroll through the list and select your network by pressing the arrows above and below the network names. To refresh the network list, just exit the list and enter again.

When prompted, enter the network password in the text field, then touch the **Connect** button. It may take a few seconds to connect.

CHARGING



Plug in PocketC.H.I.P. to a **5-volt 1.5A power** supply with a USB-micro cable to charge the **3.7V battery**.

Because it is C.H.I.P.'s on-board circuitry that manages the charging of PocketC.H.I.P.'s battery, the **C.H.I.P. must remain attached to PocketC.H.I.P. for battery charging**.

PocketC.H.I.P. is **compatible with most cell phone chargers** that use a USB-micro cable.

TROUBLESHOOTING

If PocketC.H.I.P. becomes unresponsive, **hold down the Home/Power button for eight seconds**. This will cut power to PocketC.H.I.P., and immediately shut it down. Only use this shutdown method if no other shutdown methods work.

PocketC.H.I.P. at a Glance

Touchscreen

PocketC.H.I.P. features a **4.3" display** made up of **480 x 272 pixels**. The display is **resistive touch** and responds to **tapping** and **sliding**. This means you can use a finger or almost any object that isn't sharp – you don't want to scratch your screen.

Tap once to open apps, press buttons, and close windows.

Press and slide to scroll, adjust sliders, and resize windows.

Keyboard

PocketC.H.I.P. has a full **QWERTY keyboard** with comfortably located arrow keys for gaming.

Each button is labeled with **pink text**, which identifies the default button behavior. Some buttons have two rows of pink text stacked atop each other. The bottom text is the primary behavior of the key. The top text identifies the button's secondary behavior, which is accessible by holding down **SHIFT** and pressing the button.

For example: **Holding SHIFT** and **pressing 1** types **!**

Some buttons are labeled to the top-left with **white text on a pink background**. These keys are mostly located on the right side of PocketC.H.I.P.'s keyboard and are for characters like function keys (**F1**, **F2**, … **F11**) and lesser used punctuation marks (**{}<>|;**). To type these specialized characters, **hold the FN key** and press the desired button.

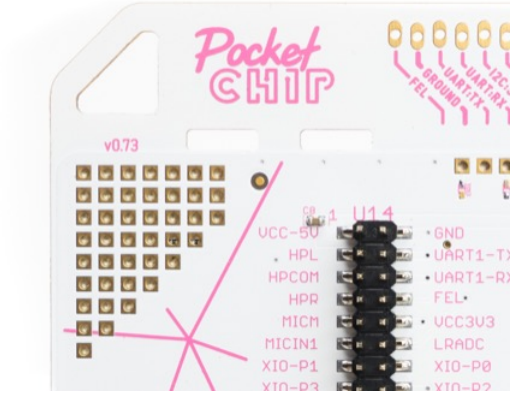
For example: **Holding FN** and **pressing J** types **>**.

Removable enclosure

PocketC.H.I.P. is extremely hackable and we encourage you to modify the hardware. It is **easy to take apart**, since there are no screws used in the assembly.

If you want to fully disassemble PocketC.H.I.P., first (carefully) **remove C.H.I.P.** from the back of PocketC.H.I.P.. Then flip PocketC.H.I.P. around and **remove the frame** (technically known as a bezel) around the perimeter of the screen. **Remove the back case** of PocketC.H.I.P. by pressing the tabs above the screen and on either side of the Home/Power button.

While the case is open, check out the **"secret" prototyping area** and **GPIO solder pads** inside the enclosure!



GPIO Access

Along the top edge of PocketC.H.I.P. are input and output pins from C.H.I.P.. These are great for attaching and controlling sensors, motors, and LEDs.

See the C.H.I.P. documentation to learn how to use them here.

Pencil stand

Give your hands a break! You can **prop PocketC.H.I.P. up on a table with a pencil or pen**. Pencils go in the hole to the right, and pens in the left hole. You only need one to prop PocketC.H.I.P. up.

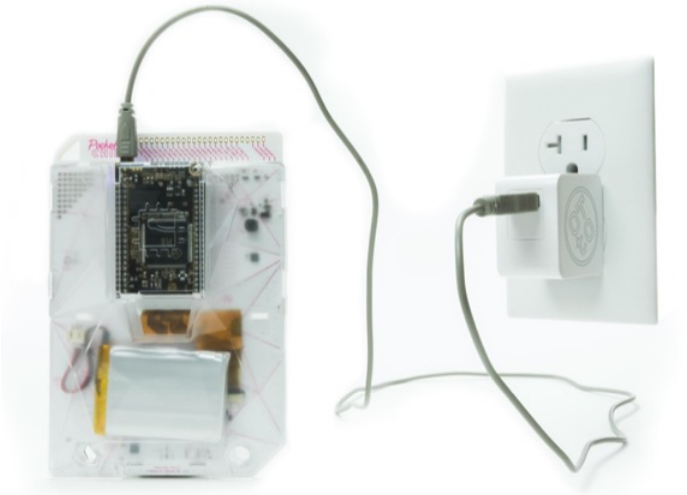
Power and Charging

Battery Life

Your PocketC.H.I.P. uses a **3.7-volt LiPo battery**, that should last for about **five hours** of use. Increase battery life by dimming the screen brightness and turning off WiFi.

The top left corner of the screen shows your battery level, and PocketC.H.I.P. will warn you when the battery charge is getting too low for operation.

Charge PocketC.H.I.P.



Plug PocketC.H.I.P. into a 5-volt 1.5A power supply with a USB-micro cable to charge the 3.7V battery.

Because it's C.H.I.P.'s on-board circuitry that manages the charging of PocketC.H.I.P.'s battery, the C.H.I.P. must remain attached to PocketC.H.I.P. for battery charging.

PocketC.H.I.P. is compatible with with most cell phone chargers that use a USB-micro cable.

Sleep and Shutdown

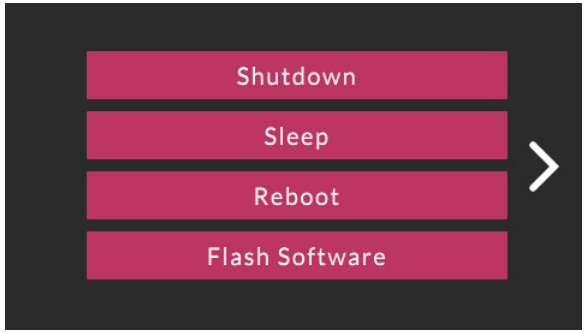
SLEEP

Sleep is a low-power state that saves battery, and also saves you time, since it's faster for PocketC.H.I.P. to wake from sleep than to boot from a powered-off state.

To enter sleep mode, **tap the power icon** in the bottom left corner of the home screen and **select "Sleep."** from the menu.

PocketC.H.I.P. is designed to turn off the screen and backlight after a few minutes without any user interaction.

To wake up PocketC.H.I.P. from sleep state, simply touch the screen or press a key.



SHUTDOWN

Shutdown PocketC.H.I.P. by pressing the **power icon** in the bottom left corner of the home screen and **tapping "shutdown."**

If for some reason, PocketC.H.I.P. becomes unresponsive, you can also shut down PocketC.H.I.P. by **holding down the HOME/Power button for eight seconds**. This cuts battery power to PocketC.H.I.P. and shuts it off. Only use this method if all other methods do not work.

Using PocketC.H.I.P.

Keyboard Shortcuts

PocketC.H.I.P. has a few keyboard shortcuts that will make it faster for you to do common tasks on the device.

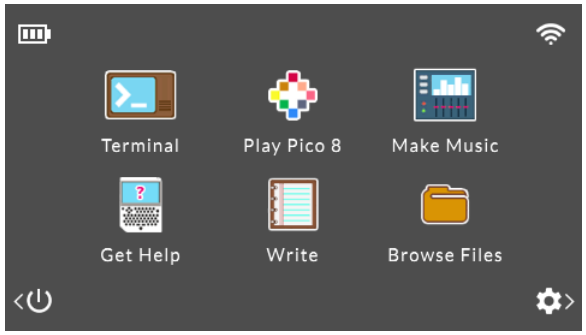
- When multiple applications are open, hold **CTRL** and press **TAB** to change the current window (also known as window focus).
- Hold **CTRL** and press **q** to quit an application.

Flashing

To flash PocketC.H.I.P., take C.H.I.P. out and flash it independently. To flash it with the latest factory image follow the **Flash C.H.I.P. With an OS** instructions on the C.H.I.P. doc page.

WARNING: This will permanently **delete all the data** on PocketC.H.I.P., so backup anything you want to keep!

Applications



Your PocketC.H.I.P. comes with six applications on the Home Screen.

- **PICO-8** - play, create, share 8-bit games
- **SUNVOX** - listen or compose electronic music
- **Terminal** - use a Linux shell to run commands
- **Write** - a lightweight text editor
- **File Browser** - a graphical file browser
- **Help** - the same documentation you're reading here, built into PocketC.H.I.P.

PICO-8

PLAY PICO-8

Play games, change games, and make games with PICO-8! With a couple keystrokes you can join the PICO-8 community and modify their games, or even make your own!

For more resources to learn PICO-8, search YouTube for **PICO-8** videos and check out the PICO-8 Fanzine link.

PICO-8 starts in **splore mode**, which lets you select which game to load.

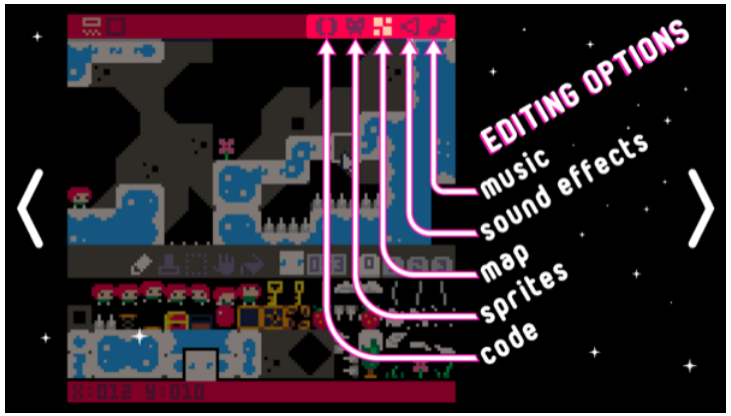
If PocketC.H.I.P. is connected to WiFi, **PICO-8 community made games** can be downloaded and played here. Navigate the menus using the arrow keys, and press 0 to select a game.

- **Favourites:** Save games to this list by pressing **ESC** while in the game and selecting “Favourite”. Games on this list are playable even when you’re not connected to WiFi.
- **New:** Lists the newest additions to the PICO-8 community.
- **Featured:** Lists the top-rated games from the PICO-8 community.
- **Work In Progress:** Lists recent releases of unfinished games submitted by members of the community.
- **Collaboration:** Lists user-submitted resources, remixes, and other useful things for others to use in their creations.
- **Search:** Performs a text search of PICO-8’s game library
- **/:** Lets you navigate the PICO-8 folders on your PocketC.H.I.P.

While in the splore mode, press **ESC** and select **EXIT TO CONSOLE** to start PICO-8’s command line interface. PICO-8’s command line commands are listed below:

- **help** - lists the available commands
- **splore** - return to cart explorer
- **dir** - list the contents of the current directory
- **cd [directory name]** - change to the desired directory
- **cd ..** - go up a directory
- **cd /** - change back to top directory (on PICO-8’s virtual drive)
- **keyconfig** - customize the keys used by all games
- **mkdir** - make a new directory
- **folder** - open the current directory in the host operating system’s file browser
- **load [name of game]** - load a game from the current directory (this is like putting a cartridge into the console)
- **run** - plays the cart that is currently loaded
- **save [filename]** - saves the currently loaded cart with the given name (this is used when you’ve made changes to the game’s code, graphics, or music)

MAKE GAMES (WITH PICO-8)



Gamers, get ready to become game-makers. In addition to playing the community’s games, PICO-8 allows you to modify existing games, or create games of your own using the code, graphics, and sound editors. See the image above to learn which icon stands for which editing mode, and keep reading for an explanation of each mode.

CODE EDITOR

Access the code editor from the command line by pressing **ESC**. If you are in the middle of a game, press **ESC** and select **EDIT THIS CART** to edit the game's code. Some other helpful shortcuts are:

- **Hold SHIFT** - select multiple characters or lines (or tap-and-drag)
- **CTRL-X**, **CTRL-C**, **CTRL-V** - cut, copy, or paste a selection
- **CTRL-Z**, **CTRL-Y** - undo, redo
- **CTRL-F**, **CTRL-G** - search for text, repeat search
- **ALT-UP**, **ALT-DOWN** - navigate to the previous, next function

The code editor is not the only editor in PICO-8. Access the other editors by tapping on the icons in the upper right-hand corner of the editor.

SPRITE EDITOR

Use the sprite editor to create custom artwork that makes up tiles, characters, or other graphical elements of the game. The navigator at the bottom of the sprite editor screen shows an 8x8 pixel box that is displayed in the sprite sheet window. It is possible to use the tools (pan, select) to edit larger areas.

The tools can be found directly below the 8x8 editor widow and above the sprite sheet. Use the following tools to create and edit sprites:

Draw Tool

- Click on the desired color and then click in the editor window to apply the color to each pixel.
- Hold the **CTRL** button and click on a pixel to replace all of the same-colored pixels in the window with the selected color.

Stamp Tool

- Select an area of the sprite sheet that you want to copy using the select tool. Copy to clipboard with **CTRL+C**.
- Select the stamp tool and click the location in the editor window where you want the copied pixels to be pasted. Click the top-left corner to center design.
- Hold **CTRL** while stamping to treat the copied black pixels as transparent.

Select Tool

- Use the shortcut: **SHIFT** or **S** to save time.
- Click and drag with the select tool to highlight an area of the sprite sheet.

- Enter or click to select none.

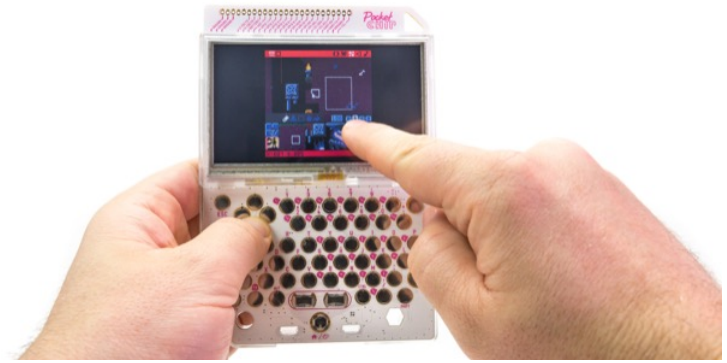
Pan Tool

- Use the shortcut: **Spacebar**.
- Click and drag to move around the sprite sheet.

Fill Tool

- Fill an area with the selected color.
- If you have selected an area of the sprite sheet, the fill will be limited to the selected area.
- If no selection is active, the fill will be limited to the area in the editor window.

MAP EDITOR



The tools for the map editor work similarly to those in the sprite editor. However, rather than choosing colors, select a sprite and use the draw or fill tool to place sprites into the map sheet.

SOUND EFFECTS EDITOR

PICO-8's sound editor has two view modes: **graph view** and **tracker view**. Switch between modes by tapping on the graph and tracker buttons in the upper-left corner of the sound editor.

In both views, the number in the top left, under the view selector is the sound effect number. PICO-8 can handle **64 different effects**.

Change the speed of the sound by clicking on the number in the box labelled **SPD**. Tap and drag to change the value (dragging left decreases, dragging right increases). The **SPD value describes the duration of each note**, so the higher the value, the slower the sound will play.

The **LOOP values** define the start and end points of a section of the sound effect that repeats. These can be changed by tapping and dragging like the SPD values.

Select from the **eight available instruments** by clicking on the gray waveform boxes below the SPD and LOOP fields.

Press the **spacebar to play/stop** the current sound effect.

GRAPH MODE

In **graph mode**, **choose an instrument** and then click-and-drag left-to-right to **draw** the sound across the pitch window. Draw higher in the window to create a sound with a higher pitch. Adjust the volume of each note, with the sliders in the volume window at the bottom of the graph mode screen.

TRACKER MODE

In the **tracker mode**, each line of **six dots represents a note**. Each dot represents an aspect of the note. In left-to-right order they are:

- frequency, octave, instrument, volume, and effect.

Frequency

- Denoted by the letter of the musical pitch.
- Input the pitches, using the **q2w3er5t6y7ui** keys like a piano.
- **Q** is a *C* note, **W** is a *D* note.
- The number keys are the **sharps** and **flats** (like the black keys on a piano).

Octave

For each note, **choose octave 1**, **2**, **3**, or **4** in the **OCT field** at the top, or type the corresponding number. **1 is the lowest octave** and **4 is the highest**.

Instrument

Choose one of the instruments in the gray waveform boxes or type the corresponding number (0 through 7).

Volume

Choose volume level in the VOL field or type the corresponding number (0 through 7).

Effect

Choose an effect from the boxes under the instruments or type the corresponding number (0 through 7). The 8 effects are:

- **0** - none
- **1** - slide
- **2** - vibrato
- **3** - drop
- **4** - fade in
- **5** - fade out
- **6** - fast arpeggio
- **7** - slow arpeggio

MUSIC EDITOR

The **music editor** allows **up to four effects at a time** for your game's soundtrack. Click on the boxes above each column to activate the track and choose which effects will be included in each song pattern.

Patterns can be set to move to the next pattern, repeat the current pattern, or stop when finished with the arrow and stop icons on the upper right.

PICO-8 can hold up to **64 song patterns**.

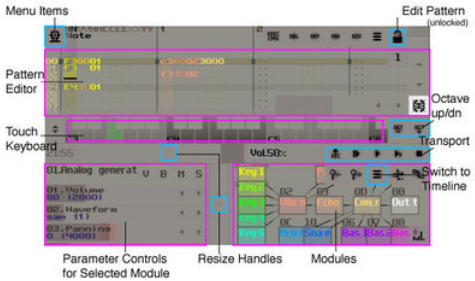
SunVox

The **SunVox tracker** is a fully featured music production studio. It's lightweight, sounds great, and is designed to work with a stylus on a single, small screen. As a result, it's a perfect fit for for making music and playing with sound on PocketC.H.I.P..

To get started launch **SunVox**, put on some headphones, press **SHIFT-space** to start playback, and dive into a complete world of electronic sound. While SunVox is pretty much limitless in its configuration, C.H.I.P. has limited CPU and memory resources. Keep in mind if you add a lot of filters, reverbs, and delays, SunVox might stutter on playback. It's also a good idea to quit any other processes running on C.H.I.P.. Use `ALT-tab` to go to other applications and windows and `CTL-q` to quit them.

INTERFACE OVERVIEW

Here's a quick overview of what you see when you launch **SunVox**, and what the different parts of the interface do. Visit the SunVox page for more information, including complete keyboard mappings. There are also lots of introductory SunVox videos on YouTube, just search for **SunVox intro videos**.

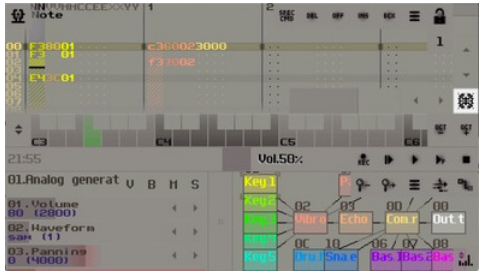


KEYBOARD SHORTCUTS

We've modified some of the default keyboard shortcuts to work better with the PocketC.H.I.P. keyboard. Here's what's different:

Command	Keys
play	Shift-space
stop	Shift-v
play from beginning	Shift-b
play pattern	Shift-n
record	Shift-r
octaves 0-8	Shift-[0-8]

PATTERN EDITOR



The **Pattern Editor** is **like a page of sheet music**. Instead of staffs, measures, clefs, notes, and articulations, it has 32 rows and several columns that represent pitch, timing, and even how a pitch is played (soft, hard, bright, etc).

Patterns represent chunks of a song that will later be dropped into the timeline of the song and arranged with other patterns.

Note: All the numbers are in **hexadecimal**, so instead of the number **46**, you'll see **2E**. These notes can play drums, lead instruments that sound like a guitar (maybe), bass notes, or even atonal washes of sound.

In the **pattern editor** you can **add notes and note modifiers to compose patterns**.

Spacebar toggles edit mode on and off, use the **arrow keys** to select rows, use **letters** to enter notes, use **numbers** to enter (hexadecimal) values for velocity, module, and control values.

TOUCH KEYBOARD

The **Touch Keyboard** is in the middle of the screen. Tap on it and you'll hear sound.

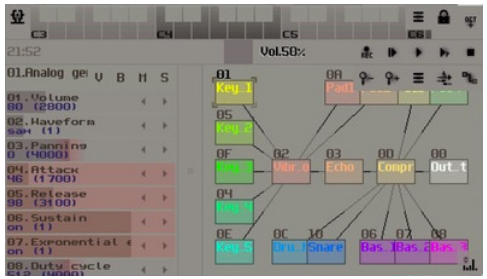
If you're editing a **Pattern**, you can use this to enter notes. Just tap in the first column in the editor where you want a note to play and then tap the note on the touch keyboard. The editor will record the note you play and then move to the next line so you can tap the next note you want to play.

You can also use **PocketC.H.I.P.'s QWERTY keyboard** to enter notes. To enter notes on the QWERTY keyboard, use it similar to a piano. For example, **Z is a c note** and **X is a d note**.

From left to right across the bottom row of the keyboard, the notes ascend.

For **sharp** and **flat** notes, use the row above. For example, **S** is a c-sharp because it is above and between the **Z** and **X** keys (similar to where the c-sharp key is on a piano, above and between the c and d notes).

MODULES (SYNTHS AND EFFECTS)



The **Module Editor** is located below the **Touch Keyboard** on its right. This includes the **different instruments**, **synthesizers**, or **effects** you can use to change the sounds that you put into the patterns above. You can add new modules, delete current modules or rearrange modules to fit your needs.

With any sounds you make, you need something to generate the sound first. Double-tap on the background in the **module editor** and then choose a **generator** from the list. Once you've picked a generator you need to **connect it to the output**. Do this by **holding SHIFT** and then tapping and dragging from the generator to the OUT box

You can also add **effects** to the sounds made by the generator. Double-tap in the background again and choose an effect from the list. Now change the route the sound goes through by tapping and dragging from the generator to the effect. Then tap-and-drag from the effect to the output box.

You can have **multiple instruments** and **different paths** for the sound in the editor at one time. When editing patterns, tap on the generator you want to use and then edit the pattern. Changes to the pattern will be made using the currently selected generator.

To delete an effect or generator, double-tap the module and tap the delete button.

PARAMETER CONTROLS

Parameter Controls for the currently selected module are in the bottom left corner of the interface. Violin players can bend a string and change how they bow, vocalists can shape their mouths and vocal chords, electric guitarists can stomp on pedals and hit the whammy bar, synthesizer nerds can turn knobs and sliders. In SunVox, you can modify how a synth or effect sounds using the horizontal sliders in the Parameter Controls.

Tap on a module and use the Parameter Controls on the left to modify the sound. Play the (piano or PocketC.H.I.P.) keyboard to hear the sound of a synth module. Use **CTRL-arrows** to jump to different modules. **SHIFT-drag** to connect and disconnect modules.

- **Resize Handles**

  Tap-and-drag in these areas to resize the panels.

- **Transport**

  Record new pattern into timeline, play from beginning, play, play pattern, stop.

OCTAVE UP/DOWN

Change the octave of the touch keyboard.

- **Edit Pattern Indicator**

  When locked, you can't make changes to the pattern.

- **Spacebar**

  Unlocks the world of pattern editing!

- **Volume**

  Tap-and-drag the volume control to change output volume.

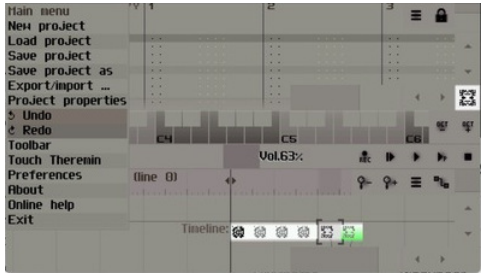
- **Menu Items**

Sunvox has one simple menu. Tap here to save and load projects, set preferences like **MIDI controllers**, and the ultra-fun **Touch Theremin** feature! Select it in the Menu, and start making some noise!

- **Switch To Timeline**

  The **Timeline** allows you to place, move, and rearrange patterns to create a song. On PocketC.H.I.P.'s small screen, you'll need to use the **Switch To Timeline** button.

  In **Timeline**, you can also freely record notes while you play them with the **Record** button, or you can clone patterns to repeat them. Move the pattern blocks around to create your composition. When finished, you can render a finished stereo file and distribute it as you want!



- ***MIDI***

  You can attach a **MIDI keyboard or controller** to PocketC.H.I.P.'s USB port and have even more fun with SunVox. Not only can you play notes from a keyboard, but you can use MIDI knobs and sliders to control parameters of different synths.

Terminal

Many may find the **Terminal** archaic or intimidating, it's a place to **type commands directly to the computer** for execution and evaluation by the operating system. There are no icons, just text.

Use the terminal to dive into the operating system's guts, quickly move files around, play with PocketC.H.I.P.'s GPIO, or extend its capabilities. There's a primer on using Terminal in the C.H.I.P. documentation here if you want to learn more.

TERMINAL TOP BUTTONS

The Terminal has a few small buttons at top. From left to right, they are:

- New Tab
- Close Tab
- Zoom in (increase font size)
- Zoom out (decrease font size)
- Copy selected text
- Previous tab
- Next tab
- Flip toolbar
- Paste - Paste selected text (from another tab, not another application)

Write

Write is a minimalist text editor that's well suited for basic text entry tasks. If you're looking to code with Write, you'll be pleased to learn that it supports line numbering and auto indentation, just look under the **"Option"** menu.

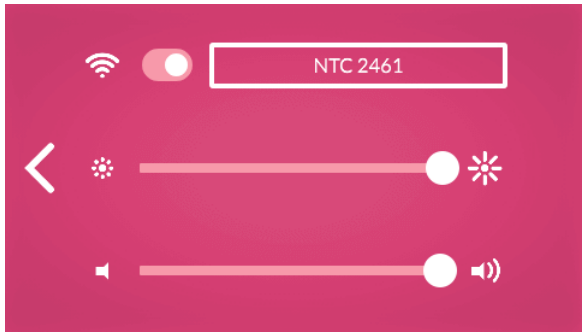
File Browser

The **File Browser** provides a **visual representation** of the files on your PocketC.H.I.P. using icons. Drag, drop, and double-click your way through this application for full control over every file on your device.

Help

You are reading it right now. No kidding! This document is available online and locally on PocketC.H.I.P., which means anywhere PocketC.H.I.P. goes, help will be right there with it.

Settings



Use the **PocketC.H.I.P.** settings to change **WiFi**, **screen brightness**, or **volume levels**.

To access the **PocketC.H.I.P. settings**, tap on the sprocket icon on the Home Screen.

WiFi & Bluetooth

From the Settings Screen, tap the toggle switch next to the WiFi icon to turn WiFi on or off.

Press the button to the right of the WiFi switch to open a menu of all the networks in range. Scroll through the list by tapping the onscreen arrows, and select your network by tapping on its name.

When prompted, enter the network password in the text field, then touch the **Connect** button. It may take a few seconds to connect.

Currently only WiFi is configurable from the PocketC.H.I.P graphical interface. If you want to configure Bluetooth, consult the C.H.I.P. documentation page here.

Screen Brightness

Tap the brightness slider on the left to decrease brightness or tap the right to increase. Lowering the brightness is an easy way to increase battery life.

Volume

Adjust the volume slider by tapping on the left to decrease volume or on the right to increase it. Of course, you'll need to have headphones or speakers attached to PocketC.H.I.P. to hear anything.

Security

Just like you have a **username** and **password** for your e-mail account, PocketC.H.I.P. has a username and password for its operating system. The main user account on PocketC.H.I.P. is **chip**, and the password is also **chip**. Both username and password are case sensitive.

At startup, **PocketC.H.I.P. automatically logs you in as chip**. This means there's no need to manually enter chip's password chip. There are times when you'll need to use the chip password, but you can get most things done without it.

PocketC.H.I.P. also has a second username called root, which should only be used for administrative tasks such as installing and removing software. The root password is also chip, and both are also case sensitive.

Never login directly as root, since it is extremely easy to delete critical files in the system. Instead, use the system administration command **sudo**, which provides a bit of protection from accidentally breaking your system.

For more information on using sudo, see the C.H.I.P. docs here.

Username	Password
chip	chip
root	chip

CHANGING YOUR PASSWORD

You should change your password for both the chip and root account to something other than the default, chip. Open the **terminal application** from the PocketC.H.I.P. Home Screen and type the following command:

`passwd`

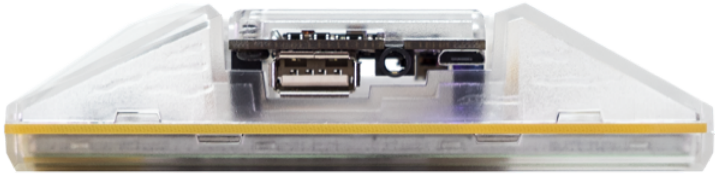
and press **ENTER**.

You'll be prompted for your current password, which is chip and then required to enter in your new password twice. That's it!

Using Accessories

Just because **PocketC.H.I.P.** is complete with a keyboard and screen doesn't mean you can't add speakers, storage, or wireless gadgets to make it even more fun.

PocketC.H.I.P. input and output ports are all handled by C.H.I.P.. Chances are good that if an accessory works with C.H.I.P., it will work with PocketC.H.I.P.!

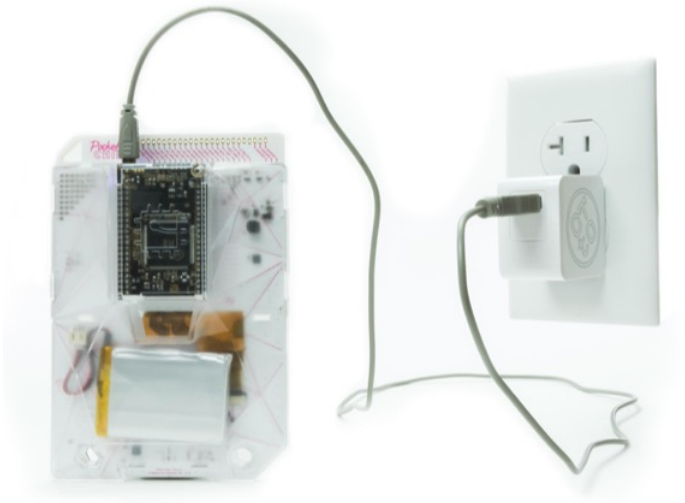


Audio

PocketC.H.I.P. does not have a built-in speaker, but that doesn't mean it can't output sound.

To listen to audio from PocketC.H.I.P. **attach any wired headphones or speakers to the audio jack** at the top of the device. This jack is known as a TRRS jack and can accommodate headphones. With a simple modification to the C.H.I.P., the TRRS jack can accomodate headphones that have built-in microphones.

Micro-USB



Use the **micro-USB** port for charging PocketC.H.I.P. with a 5-volt, 1.5-amp power supply. Most cell phone chargers that use a USB-micro cable will work with PocketC.H.I.P.

Standard USB

Use the **standard USB** port for attaching USB accessories, like a **keyboard**, **mouse**, **MIDI controller**, **sound card**, **hard drive**, or **more**.

USB devices take power to operate. If they are not independently powered, they will reduce the battery life of PocketC.H.I.P. or cause operation to become sporadic.

Workshop Materials

Would you like to run a workshop using PocketC.H.I.P.? In this section you will find materials for use in the classroom or to use while developing your own curriculum. We've created introductions to PocketC.H.I.P. and Pico-8 so you get comfortable with basic operations and commands before running a lesson. We have also created several activities to start with that can be used either together or taught as separate modules. Included are editable files so you can customize the lessons or grab what assets you would like to use for your own. If you don't see a file format that's helpful to you reach out to docs@nextthing.co and let us know what you need.

All use the application Pico-8, the fantasy console used to play, create, and share games that comes installed on every PocketC.H.I.P.. Pico-8 has proven to be excellent for learning exercises emphasizing programming and game design skills.

Getting Started

These introductory materials are written for educators but can also be used in educational material for students. They will teach you the basics needed in order to lead an activity using PocketC.H.I.P. and Pico-8.

- Getting Started with PocketC.H.I.P.
- Getting Started with Pico-8

Activity Outlines

- Pico-8 x PocketCHIP: Customize Celeste - This lesson includes several ways of editing a favorite Pico-8 game, Celeste. Change the way Celeste looks, edit the map to create bridges to walk over and learn how to search and change Celeste's source code so Celeste can jump higher and advance onto the next level!
- Pico-8 x PocketCHIP: Start Creating a Game from Scratch - This lesson starts you on the path to creating a Pico-8 game from scratch. Learn how to create a sprite and make it move with the D-pad controller.
- Pico-8 x PocketCHIP: Make Celeste Jump Higher! - A short, one page tutorial on how to edit the code of Celeste to make her jump higher.
- Pico-8 x PocketCHIP: Edit Celeste Sprite - A short, one page tutorial on how to edit the look of Celeste.
- Pico-8 x PocketCHIP: Make an LED Blink with Pico-8 - A short, one page tutoroal that can easily be expanded upon to create a longer lesson covering basic DC electric circuits. Comes with an accompanying reference file defining all the parts of the circuit and how they function.

PARTS LIST AND SOURCES

Parts for the LED activity and where to get them.

- LED
- Mini breadboard
- Male headers
- Female/Male jumper cables

Glossary

apt-get: the package manager used for installing, upgrading, and removing application in Debian Linux.

Bezel: section of the case that clips around the touchscreen.

Booting: the process of PocketC.H.I.P. powering on and loading Debian.

Command Line: the area in the Terminal where text is input for the Operating System to evaluate.

Debian: a version of the Linux Operating System that runs on PocketC.H.I.P..

Fantasy Console: a console game system that does not have dedicated, specific hardware to run its software. For example, PICO-8.

Flashing: the process of overwriting the contents of NAND with an Operating System and Applications.

Linux: a computer Operating System that runs on all different types of hardware. Everything from bank ATMs and cell phones to C.H.I.P. and PocketC.H.I.P.

NAND: a type of storage used on PocketC.H.I.P. for the OS, applications, and all your files.

Open Source Hardware: Open source hardware is hardware whose design is made publicly available so that anyone can study, modify, distribute, make, and sell the design or hardware based on that design. More info at the Open Source Hardware Association.

Open Source Software: Very briefly, Open Source Software is software where the source code for a program is made freely available. But there's a lot more to this, as you can read at the Open Source Initiative website.

QWERTY keyboard: is a layout of keys where the top row's first six keys spell "qwerty".

SCP: a utility to transfer files to different computers.

Shell: see Terminal

SSH: (aka Secure Shell) is a utility used to login to remote computers running SSH service.

Stylus: a pointing device

Terminal: a program used to enter text commands for the Operating System to execute or interpret.

TRRS jack: a connector commonly used for audio or video equipment. TRRS stands for tip, ring, ring, and sleeve and refers the the way the male connector is divided.

FAQ

Can I take C.H.I.P. out of PocketC.H.I.P. and use it?

At this time, it will not work as expected without reflashing. The C.H.I.P.s in PocketC.H.I.P. run a custom graphics software that's designed for the touchscreen and PocketC.H.I.P. keyboard. C.H.I.P. may boot, but the resolution and input will not work as expected.

Is it Legal to Modify PocketC.H.I.P.?

Yes. PocketC.H.I.P. and C.H.I.P. are open source hardware. We encourage you to modify PocketC.H.I.P. and be sure to share what you've done with our community!

Is PocketC.H.I.P. Open Source?

Yes, and you can get the hardware files at our github repo.

Will my microUSB charger work with PocketC.H.I.P.?

PocketC.H.I.P. is compatible with most cell phone chargers that use a USB-micro cable. PocketC.H.I.P. needs a power supply capable of outputting 5-volts with at least 1 amp.

Can I connect PocketC.H.I.P. to a second display?

No. At this time PocketC.H.I.P. does not support multiple displays.

Will my Bluetooth device work?

Yes, so long as the device is supported under Debian Linux. However, you will need to setup the bluetooth pairing using the terminal here. Our initial release of PocketC.H.I.P. does not provide graphical bluetooth configuration.

Pinch-zooming isn't working, is my screen bad?

Your screen is fine. The resistive touchscreen used in PocketC.H.I.P. does not support pinch gestures.

How can I get PockulusC.H.I.P.?

Good news! You already almost have one. All you need to do is 3D print the file found here. If you do not own a 3D printer find a friend to do it for you.

How can I contact Next Thing Co.?

Send us an e-mail at ahoyahoy@nextthing.co.

License

U-Boot

PocketC.H.I.P. boots using U-Boot 2015.10 (GPLv2) with custom patches.

Source code is available at:

- https://github.com/NextThingCo/CHIP-u-boot

See below for the full text of the GPLv2.

Linux

PocketC.H.I.P. runs mainline Linux 4.3 (GPLv2) with custom patches.

Source code is available at:

- https://github.com/NextThingCo/CHIP-Linux

See below for the full text of the GPLv2.

PocketC.H.I.P. runs Debian 8 (Jessie)

- Debian contains various open source software.
- The license for a particular debian package is included in the package documentation in /usr/share/doc/.

PocketC.H.I.P. Launcher

The PocketC.H.I.P. Launcher is Copyright © 2016 Next Thing Co.

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The PocketC.H.I.P. Launcher is built using JUCE

https://github.com/julianstorer/JUCE

Most JUCE modules are shared under the GNU Public Licence (GPLv2, v3, and the AGPLv3). This means that the code can be freely copied and distributed, and costs nothing to use in other GPL applications. One module (the juce_core module) is permissively licensed under the ISC.

PICO-8

PICO-8 v0.1.6

http://www.pico-8.com

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Author: Joseph White // hey@lexaloffle.com

PICO-8 is built with:

- SDL2 http://www.libsdl.org
- Lua 5.2 http://www.lua.org - see license below
- GIFLIB http://giflib.sourceforge.net/

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SunVox

SunVox modular synthesizer

Copyright © 2002 - 2016, Alexander Zolotov nightradio@gmail.com, WarmPlace.ru SunDog engine (part of SunVox)

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Ogg Vorbis ‘Tremor’ integer playback codec Copyright © 2002, Xiph.org Foundation

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Also add information on how to contact you by electronic and paper mail.

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