



Getting Started

The Rhodes Chroma by Cherry Audio is an incredible replication of one of the most advanced analog poly synthesizers ever conceived. Conceptually, its intention was to combine the massive flexibility of a patch-cable analog modular synthesizer with full digital control and memory, as well as up to 16-voice polyphony. If this wasn't enough, a rare keyboardless Expander module was produced in small numbers that doubled the Chroma's capabilities.

The conception, creation, and demise of the original Chroma is a famous story in the annals of synthesizer history. Though released and branded as a Rhodes instrument (makers of the world's most popular electric piano), in actuality, the Chroma was developed by ARP Instruments. Sadly, its development was completed in 1981 just as ARP was going into receivership; fortunately, the Rhodes company wisely acquired production rights (as well as key members of the development team), otherwise the Chroma might never have seen the light of day.

So what makes the Chroma so special? At a glance, it appears to be a typical 80s-era, single-slider-controlling-many-parameters, analog polysynth. Furthermore, its sound generation utilizes then *de rigeur* Curtis filter, VCA, and envelope chips. The answer lies in its advanced signal routing, modulation, and layering capabilities, which were far ahead of almost any

other analog polysynth (to be fair, Oberheim's Xpander and Matrix-12 featured some pretty awesome mod capabilities, but the the Xpander wasn't released for another three years in 1984).

The Chroma's primary innovation was its ability to reconfigure filter and VCA signal paths, enabling numerous series and parallel filter routings and audio-rate filter and amplitude modulation, as well as multiple oscillator sync and ring modulation options. This enabled an incredibly wide sonic palette. The Chroma also featured an advanced keyboard action with genuine wooden keys and precise weighting for highly expressive velocity and aftertouch control. And though it's easy to overlook these days, the Chroma was also an innovator in the pre-MIDI realm of connectivity and computer control - it included a 25-pin D-sub connector that allowed interfacing with either another Chroma, the aforementioned Chroma Expander, or it could be connected directly to an Apple II computer for sound programming via proprietary software.

Unfortunately, the Chroma had a number of factors going against it. Most significantly, given the hardware limitations of the time, its user interface didn't adequately support the vast quantity of menus and parameters, making sound programming a frustrating slog entailing constantly reference to a printed chart of parameter information and signal routing diagrams. Not long after its release, the Chroma was in the unenviable position of being a large, heavy, and expensive instrument when Yamaha released its world-beating and affordable DX-series FM synthesizers. Rhodes did release one more polyphonic synthesizer, the Chroma Polaris, but this was a far more conventional (and more affordable) six-voice polysynth, designed to compete in the mid-level market segment occupied by instruments such as the Roland Juno series, Korg Poly-61, Kawai SX-210, and others.

Due to its relative rarity and expense, the Chroma became what we refer to as a "unicorn" instrument - a seldom-seen-in-the-flesh powerhouse that few musicians get to experience. Cherry Audio's Rhodes Chroma resurrects the spirit and sounds of this incredible instrument with a mind-blowing accurate replication. Due to its highly complex and quirky nature (and sheer amount of parameters), this has been one of the most challenging instruments we've created thus far, and we couldn't be more proud of the results. From a synthesis perspective, every single aspect has been recreated with exacting precision - in fact, sysex patch data from the original instrument can be loaded directly into Rhodes Chroma. At the same time, we've radically altered the user interface, hugely improving the sound programming experience, with super easy-to-use multiple button menus and dozens of

informative real-time displays built right into the parameter buttons - no more laminated cheat sheet! Finally, in addition to the standard single instrument mode, Rhodes Chroma includes an "Expander" mode, effectively adding an entire second Chroma Expander synthesizer to the mix with full onscreen controls that can run in layer or split modes.

We hope you'll enjoy this amazing beast of a synth as much as we have, and as always, we humbly thank all of our customers for the unwavering support you've shown!

Technical Assistance

Cherry Audio's unique online store and automatic updating should make operation a smooth experience, but if you run into any issues or have questions, you can discuss issues online at the Cherry Audio forums at:

<https://forums.cherryaudio.com/viewforum.php?f=53>

... or you can communicate directly with one of our swell tech support staff at:

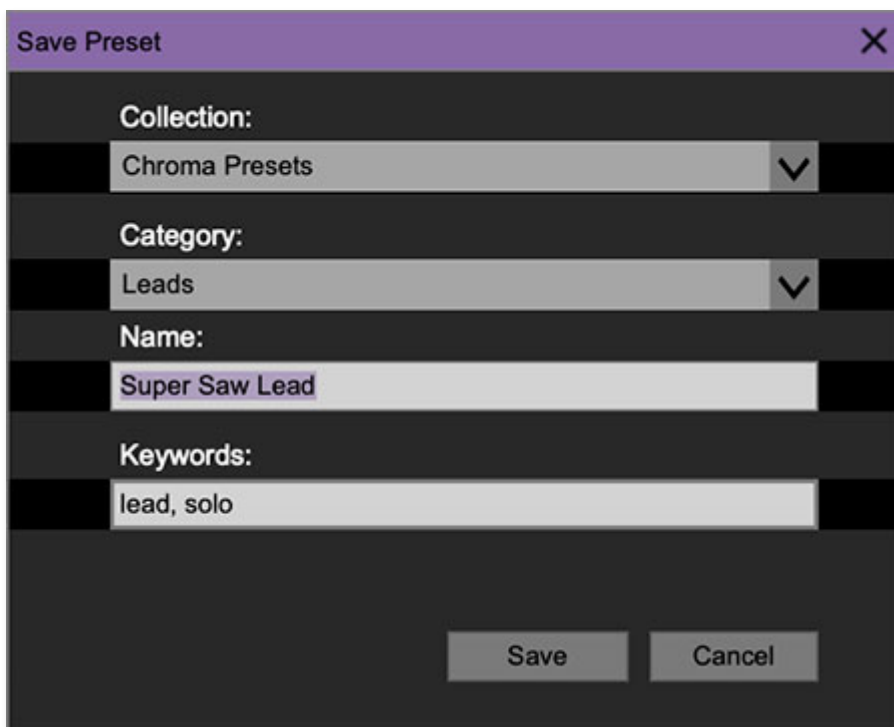
<https://cherryaudio.kayako.com/>

Top Toolbar, Sound Presets, and Focus Control



The purple strip at the top of Chroma contains all of the preset loading and saving navigation, "under-the-hood" settings, zoom and focus control, and more.

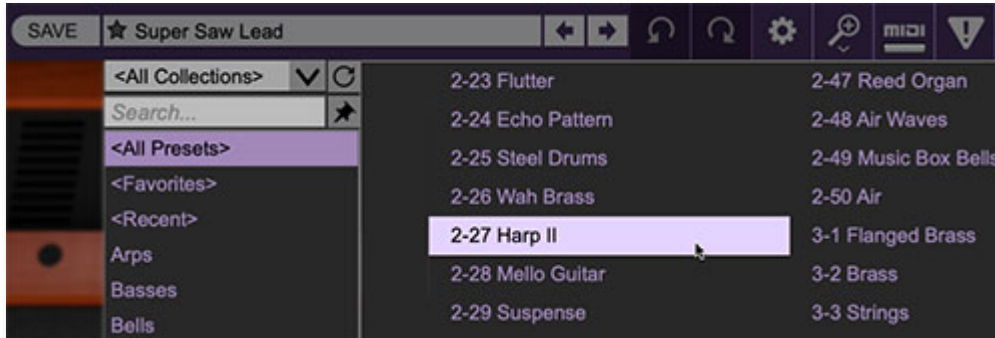
New- Opens a new blank patch preset. If an unsaved patch is currently open or you've modified an existing saved patch, a dialog asks if you'd like to save the patch in its current state. This greatly reduces the possibility of losing an edited unsaved patch.



Save- Use this to save patches. There are a couple of levels of hierarchy:

- **Collection**- This is the top level of organization, and contains entire "sets" of presets. The *Chroma Presets* are the main included collection. We also include a *User Presets Collection* for storing user presets, but you're free to create your own collections. To create a new collection, click in the *Collection* text field (where it says *User Presets* above) and type a name. User-created sounds can be freely saved to any collection.

- **Categories**- Within each *Collection* are a number of sound categories. As with collections, you're free to create as many categories as you like. To create a category, click in the *Category* text field of the *Save* dialog window and type a new category name.
- **Patch**- A patch is an individual sound. To save a patch, simply type the name in the *Name* field and click *Save*.
- **Keywords**- You can add descriptive words such as "huge," "clavinet," "noisy," etc., to patches to make them appear when terms are typed in the *Search* field. Use commas to separate multiple keywords entries.



Browsing Patches- Patches can be browsed by clicking the *<Select Preset>* field. To select a preset collection, click in the area that says *<All Collections>* or on the downward-facing arrow next to it.

Clicking on the left-side categories narrows down which patches are displayed.

- **<All Presets>** will show presets from all collections and categories.
- **<Recent>** displays recently used presets.
- **Refresh**- This is the circular arrow button to the right of the downward arrow; clicking this checks the Cherry Audio server for new or updated presets.



Pin- Clicking the pushpin icon locks the patch selection list open, allowing fast and easy browsing and auditioning of patches. Click the icon again to disable pin mode. When in pin mode, the up and down arrow keys can be used to select patches.

Preset- Step Back/Forward Arrows- These step to the previous or next preset. macOS [⌘+left/right arrow key] or Windows [CTRL+left/right arrow key] will navigate through presets back and forth in the currently selected collection/category.

Undo/Redo- These circular arrows will undo or redo the last action. It remembers many steps, so if you really loused something up, keep on (un)clickin'...

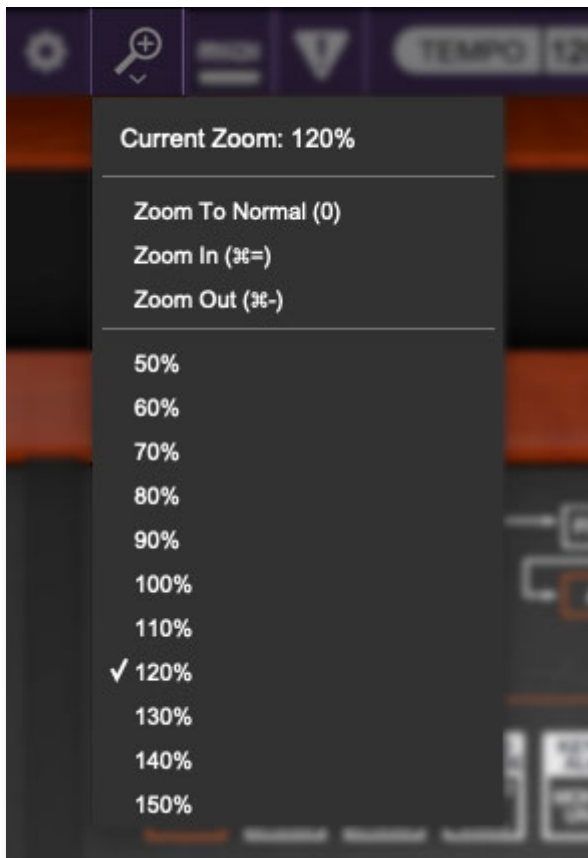
Settings- This is where user preferences for user interface, audio interfaces, user account, and more are configured. See the **Settings** section for full information.

Importing Presets with drag-and-drop

Presets can be imported singly or en masse (as a single compressed ZIP file) simply by dragging and dropping from the desktop anywhere on the user interface.

If a single *.preset file is dragged and dropped, the sound is immediately loaded and the standard Save Preset dialog appears; this lets you save the sound to the instrument's preset browser. Note that you don't have to save the sound to preset browser; if you just want to hear and play the sound, click the Cancel button in the Save Preset dialog - the sound will still be loaded.

Compressed zip files containing multiple sounds can also be drag and dropped onto the UI. This works the same as with single sounds, but instead of the Save Preset dialog, you'll see the Import Preset Collection dialog. The presets will be added as a new collection and available in the categories for which they were tagged.



Zoom Magnifying Glass- Click to resize the Chroma interface window. Selecting *100%* returns the user interface to native size.

MIDI tab- Opens the MIDI controllers tab for configuring internal and hardware MIDI controls. See the **MIDI Controllers Setup and MIDI Tab** section for full information.

! (MIDI Panic)- Click to send an all-notes-off message in case of rare, "make this #\$!%ing thing shut up?!?" stuck-note incidents.

Tempo (Standalone Version Only)- Displays Chroma's current internal tempo setting. Chroma's internal tempo affects the SWEEP section *Rate* control, the sequencer, and in the FX section, PHASER Rate, FLANGE/CHORUS Rate, and DELAY Time when *Sync To Host Tempo* is enabled in their respective control PARAMETER PROGRAM menus. The tempo setting can be changed by moving the mouse up and down anywhere in the tempo section, or by double-clicking the number and entering the desired BPM value.

The tempo display only appears in the standalone version of Chroma. VST, AU, and AAX plug-in versions receive tempo data from their host DAW app.



QWERTY Musical Typing Keyboard- Opens an onscreen keyboard allowing a standard QWERTY computer keyboard to be used for playing music notes. For more information, see the **QWERTY Musical Typing Keyboard (MTK)** section.



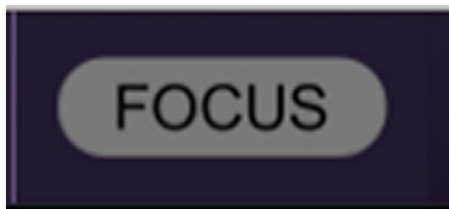
? (Help)- Clicking this launches your web browser and opens the help document you're already reading. Confusing circular logic at its finest.

Cherry Audio Chroma and Expander logos- These aren't exactly in the purple menu strip, but clicking them displays "about" information, and shows the version number and current registered user ID.



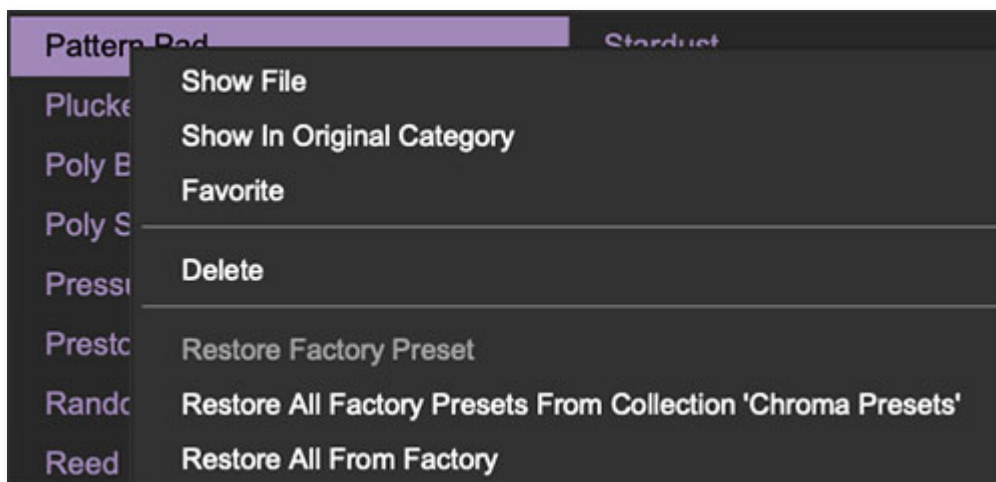
Hide/Show Keyboard- This allows the lovingly 3D-modeled keyboard to be hidden or from view (sorry Mal) in order to conserve display space. To bring it back, simply click the button again. The *Pitch*, *Mod*, and *Control 1* and *2* paddles sliders will also be hidden, but their operation will not be affected.

Focus Button



The original Chroma is pretty large; obviously we had to scale it down to fit on a computer screen. If you're using a tiny laptop, this could make things hard to see. With this in mind, the *Focus* button conveniently blows up Chroma's user interface to roughly twice its normal size within the current window size. Unlike the *Zoom* "magnifying glass" function, *Focus* doesn't affect the current window size. By default, the patch panel section fills the current window, but the view can be scrolled vertically and horizontally with a mouse wheel, track pad, or Apple Mighty Mouse finger-scrolling. Or if you're the last person on earth still using a single-button mouse, scroll bars will appear at the window edges when in *Focus* mode. (Drop us a line from your Hotmail account, umkay?)

Preset List Right-Click Functions



Show File- This displays the selected preset in the Mac or Windows folder containing it. This is useful for backing up or sending a preset file to another user.

Show In Original Category- Selects the preset within its category, i.e. the category will highlight in the left preset menu. The *Show In Original Category* command only displays if the preset was selected within the *<All Presets>*, *<Favorites>*, or *<Recent>* categories.

Favorites- Favorited presets will show in when the *<Favorites>* category is selected. A star will display next to the preset name. Right-click on the preset and reselect *Favorite* to un-favorite it.

Delete- Deletes the selected preset.

Restore Factory Preset- If one of the factory (i.e. not user) patches is edited and saved, selecting this command restores the patch to its unaltered "factory" setting. This menu will be grayed-out for user bank patches.

Restore All Factory Presets From 'Chroma Presets'- If any patches from the "factory" Chroma bank are edited and saved, selecting this command restores *all* of them to their unaltered factory setting.

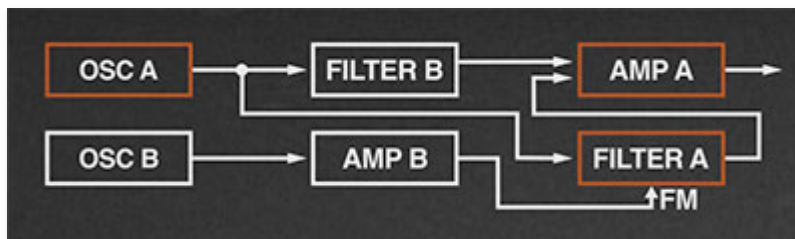
Restore All From Factory- If any patches from the factory banks are edited and saved, selecting this command restores *all* of them to their unaltered factory setting. At the time of writing, the Chroma bank mentioned above is the only factory bank, so this function and the *Restore All Factory Presets From 'Chroma Presets'* above have the same effect.

Show File- This displays the selected preset in the Mac or Windows folder containing it. This is useful for backing up or sending a preset file to another user.

Following is an overview explaining Chroma's synthesis structure. We'll delve further into the operation of individual parameter controls in the following chapters.

It's important to understand that from a synthesis perspective, Cherry Chroma *exactly* reproduces all of the original instrument's parameters and sound programming functionality - so much so that original Rhodes Chroma patch sysex data can be directly loaded with no conversion or parameter changes whatsoever. However, when it comes to various layering and combining of patches, the original was limited and frankly, pretty darn confusing. Modern computer horsepower and graphic UI's allowed us to *greatly* streamline and simplify this aspect of operation.

PATCH CONFIGURATION



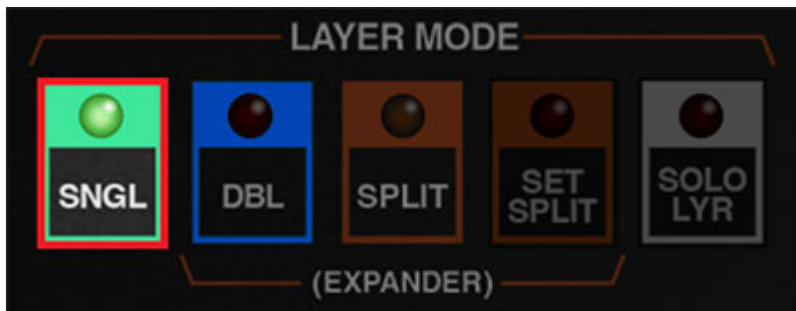
Unlike most hardwired synths, Chroma's synthesis "building blocks" can be configured in a number of ways, ranging from standard oscillator>filter>VCA to more esoteric arrangements including ring mod, oscillator cross modulation, filter FM, and more. This is referred to as *Patch Configuration*. If you're at all familiar with patch-cord based modular synthesizers, patch configuration represents how the various synthesis modules are patched together - this is the "root level" Chroma patch hierarchy. These are selected either by clicking on the *Patch Config* button in the CONTROL section, or directly on the patch configuration block diagram above the buttons. The block diagram at the top of the panel displays which of the 16 Patch Configurations is currently selected.

We'll explore patch configurations further in the **Control** section.

LAYER MODES

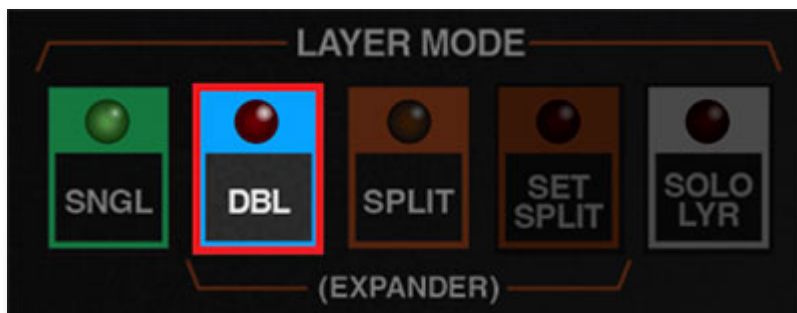
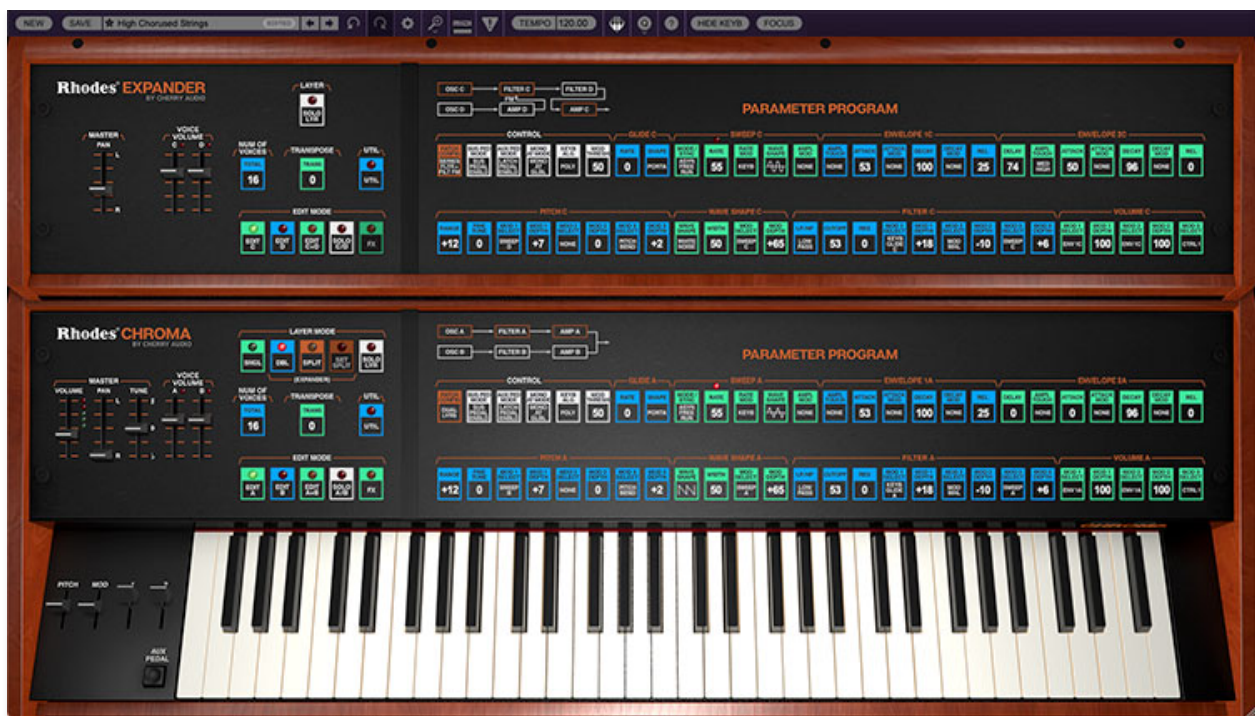
Chroma's LAYER MODE buttons allow it to operate either as a single synth (*SINGLE* mode) or as two entire independent instruments (*DOUBLE* mode, i.e. Chroma+Expander).

SINGLE MODE



When running in *SINGLE* Layer Mode, a Chroma voice generally consists of two oscillators, two 12 dB/oct filters, two VCA's, two envelope generators and a ring modulator - effectively two separate oscillator>filter>amp voice paths. These voice paths are referred to as *A* and *B*. The 50 Parameter Program buttons display parameters for a single voice path at any given time, as selected with the EDIT MODE buttons at left. In addition to the illuminated EDIT MODE buttons, the orange parameter text above the buttons changes letters to show the currently edited voice path (e.g., *GLIDE A*, *SWEEP A*, *ENVELOPE 1A*, etc., or *GLIDE B*, *SWEEP B*, *ENVELOPE 1B*, etc.) The exception are the six CONTROL section buttons - these globally affect both A and B voice paths.

DOUBLE MODE



Setting LAYER MODE to *Double* effectively enables two separate Chroma instruments - the bottom "normal" Chroma, and an Expander at the top. The Expander can operate either in layered mode or the keyboard can be split with the bottom Chroma on the bottom half of the split, and the Expander on the top half. Expander functionality is identical to the main Chroma. The only difference is that voice paths are referred to as C and D - this was done for clarity (as opposed to having two sets of A and B voice paths).

When using FX in *Double* mode, the FX section may be either global for the entire instrument (i.e., one single set of effects applied to Chroma *and* Expander) or an independent set of effects for Chroma and the Expander. This is set with the FX MODE button on the Chroma FX page.

In this manual, we'll refer to the "main" Chroma section simply as "Chroma," and the top Expander section simply as "Expander." Any time the we reference the main Chroma's voice path A or B, the same will apply to Expander's identical C and D voice paths.

SUMMARY

Depending on the Patch Configuration and LAYER MODE settings, Chroma can have from 1-4 independent voice paths at any time. And depending on patch configuration settings, these paths can either function simply and independently, or they can interact in pairs (Chroma A/B paths and Expander C/D paths) for more elaborate synthesis setups.

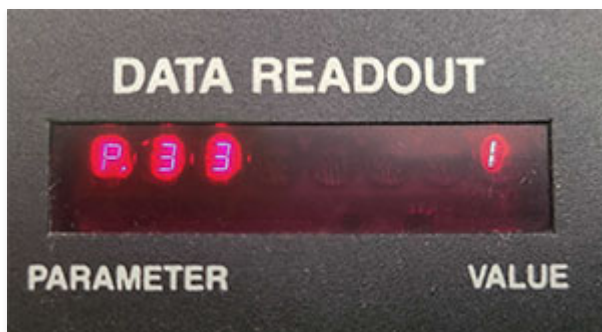
Unlike "control-per-function" synthesizers of the 70s that utilized a separate knob, slider, or button for each parameter, the original Chroma made use of a single data slider along with a multitude of membrane buttons and LEDs for parameter adjustment. This type of UI was very popular in the 80s, for a couple of reasons:

- 1) It drastically reduced the number of necessary physical knobs, sliders, or switch controls, which greatly reduced production costs.
- 2) As the complexity of instrument architecture ballooned, so did the number of necessary controls. This made it almost impossible for manufacturers to continue producing "control-per-function" user interfaces, as it would've necessitated an overwhelming number of physical controls, as well as making instruments prohibitively expensive.

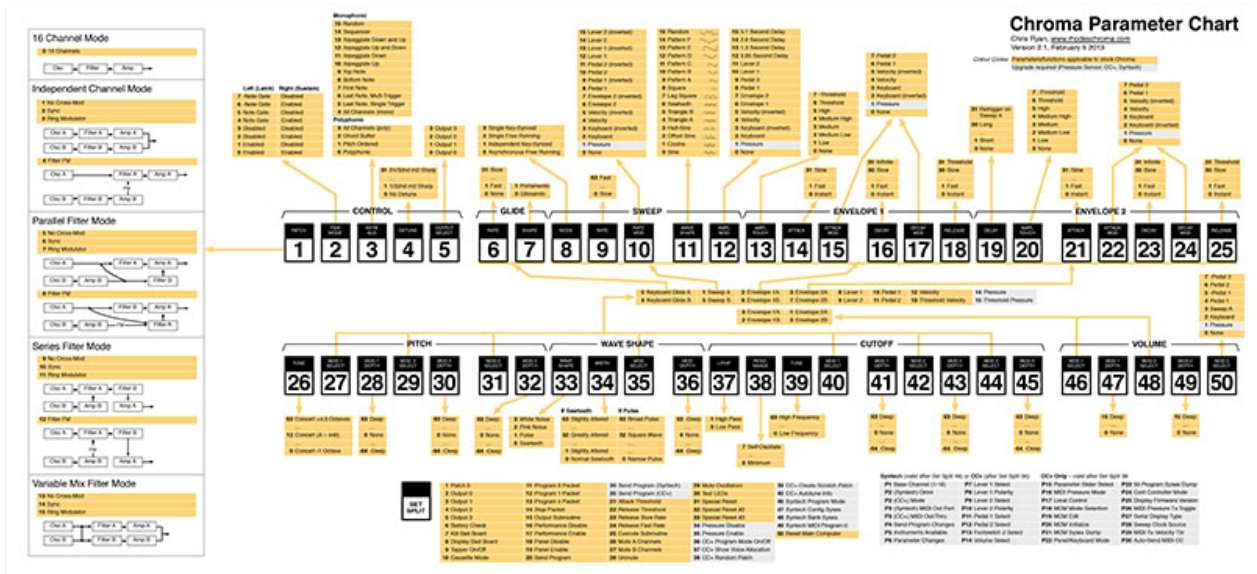
Specifically, the way the 80s-era single data-slider/many buttons instruments worked was that the parameter to be adjusted would be selected using a dedicated button (or worse, by selecting a "parameter number" with an LED display). For example, if you wanted to change the oscillator wave shape in the original Chroma, you'd press the #33 membrane button:



The teeny LED number display would show the current parameter number being adjusted and its value. In this case you'd choose value of 0, 1, 2, or 3 using the single *PARAMETER CONTROL* slider:



Obviously, the user would have no way of knowing which oscillator wave the value number selection corresponded to, so they would simply refer to this handy-dandy chart (!):



Stay with us here... now imagine having these kinds of arbitrary numbers for *dozens* of parameters, many consisting of menus with up to 16 choices. Most Chroma users had this chart printed out in a large format and laminated (and on the trip back from Kinko's, they probably made a second stop at Costco to pick up a 65-gallon drum of Excedrin).

To be fair, the Chroma certainly wasn't the only offender at the time - *everyone* jumped on the the single-data-slider bandwagon, including Yamaha, Korg, Roland, and Ensoniq. It's no accident that the control-per-function synths immediately preceding the single-data-slider era are generally considered far more desirable these days,

CHERRY AUDIO, MAKING A BRIGHTER TOMORROW

There was no way we were going to subject users to this kind of madness, so we put our heads together and created a much easier-to-navigate user experience while retaining all of the Chroma's awesome synthesis power. Obviously, having a large bank of microscopically changeable light (aka, your computer's display) made a friendly UI far more feasible. This was accomplished in a few basic ways:

- Roughly half of the buttons are used to choose a selection from a menu list. Instead of users selecting an arbitrary number, Cherry Chroma opens

popup windows with text lists of clickable selections:



- The remaining buttons are used to specify a value setting just like a regular knob or slider. On the original, you'd click the button, then move the single data slider to the desired setting.

In Cherry Chroma, the button itself *is* the "slider" control. The current value is displayed in bold text, and the setting is varied by simply clicking and dragging directly on the control. When the mouse is positioned over the control, a more accurate numeric display will show in the popup tooltip and a red line and scale appear for additional visual feedback.



- In the original instrument, the Parameter Program buttons did double-duty: not only did they specify the current sound edit parameter, they also were used to select the current patch preset, hence the 1-50 numbers printed on them (original instrument panel shown below):



Since Cherry Chroma's preset browser operates independently of the parameter buttons, we were able to use the space on the buttons where the big numbers used to be to display either the current menu selection or numeric parameter values:

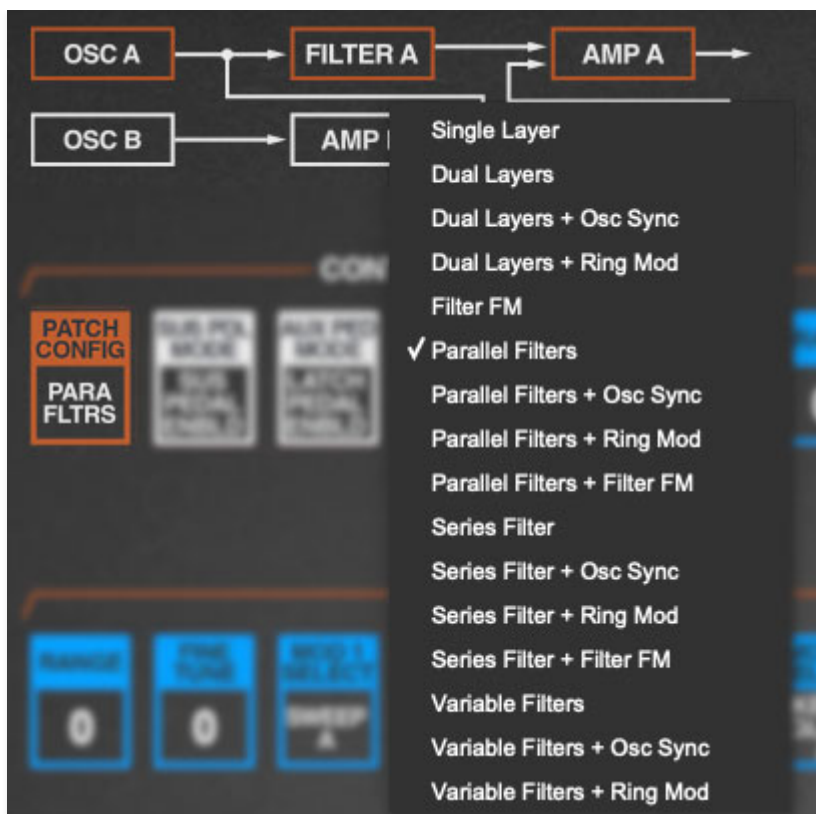


This makes it MUCH easier to know what's going on with patches at a glance. On the original instrument, if you wanted to know what the current filter resonance setting was, for example, you'd have to make sure you were in sound edit mode, then hit button 38, then check the value in the teeny LED numeric display (and if you didn't have the values memorized, refer to your value chart). Yuck.

PATCH CONFIGURATION MENU AND BLOCK DIAGRAM

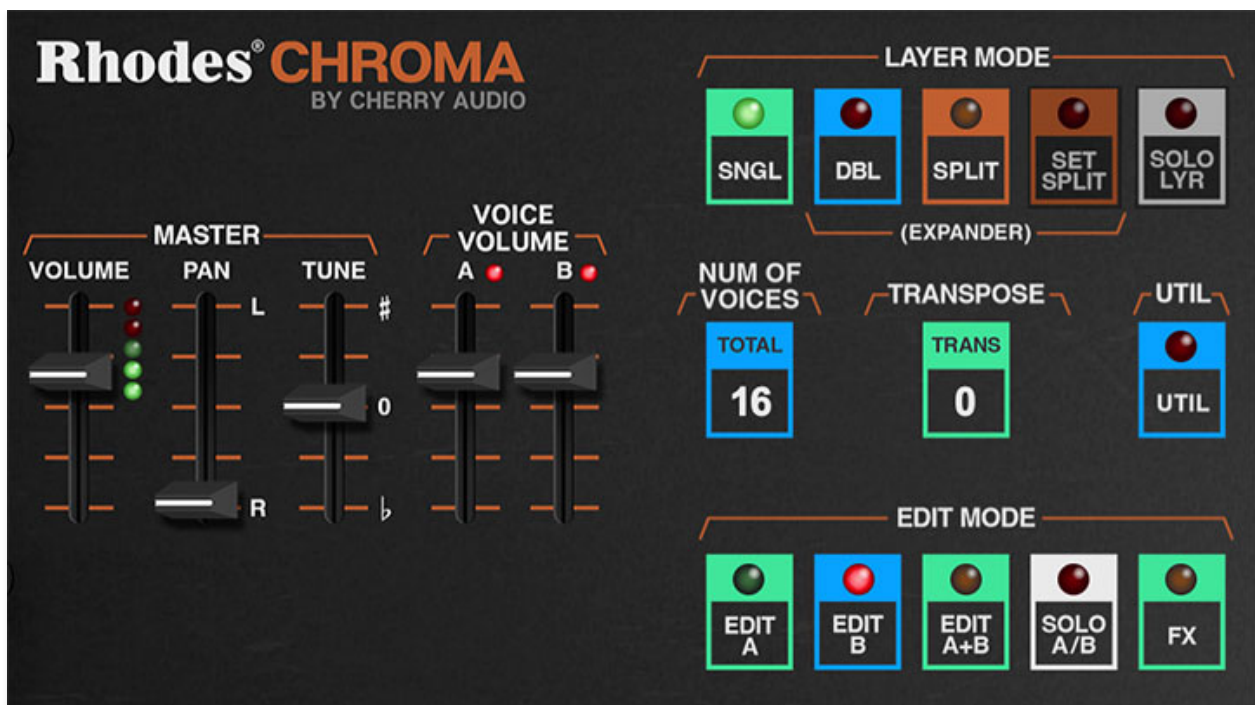
PATCH CONFIGURATION in the CONTROL section specifies the basic setup of Chroma's synthesis components. Its modular-like ability to rearrange the voice path is possibly the most significant aspect of what makes the Chroma special. (more about this in the [Voice Architecture](#) section, and specifics of each configuration in [Appendix: Patch Configurations](#))

If you've been reading up to this point, it should come as no surprise that the original Chroma's 16 patch configurations were selected by clicking the *PATCH CONFIG* membrane button, then selecting a number from 0-15... and referring to the aforementioned chart to see what you were getting. More yuck.



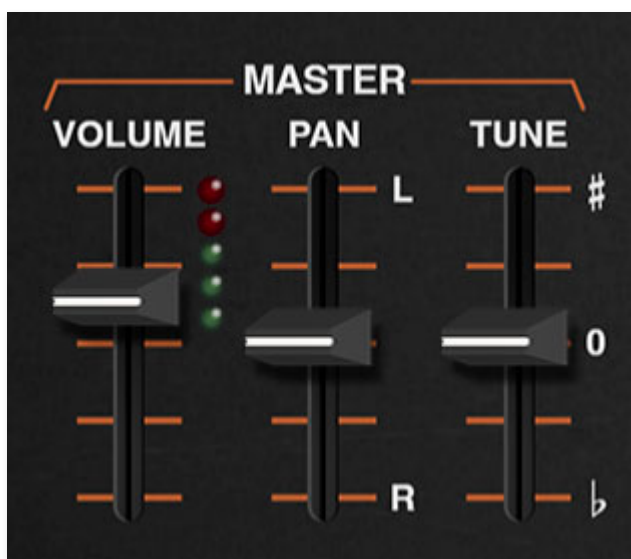
Cherry Audio's Chroma adds block diagram images right above the *PATCH CONFIG* button that change to reflect the current voicing configuration. Its boxes also turn orange to indicate which voice path is currently being edited: A, B, or both A and B (or C, D, or both C and D for the Expander).

Additionally, the patch configuration selection menu can be opened either by clicking the *PATCH CONFIG* button or by clicking anywhere on the patch configuration block diagram. See how we thought of everything?



Most of these controls affect the Chroma or Expander sections; some affect the entire instrument. We'll explain how they apply to as we go.

MASTER

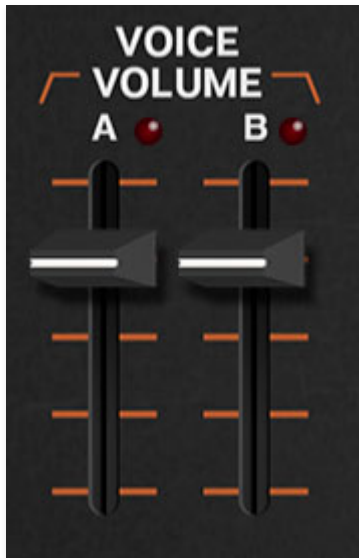


VOLUME- Sets the master volume for the entire instrument. The LED meter indicates output level; keep it in the high greens/low red to avoid undesirable digital clipping.

PAN- Sets the positions of the instrument in the stereo field; up for left channel, down for right channel. The Chroma and the Expander each have their own independent pan controls.

TUNE- Sets the overall tuning for the entire instrument up or down by one semitone.

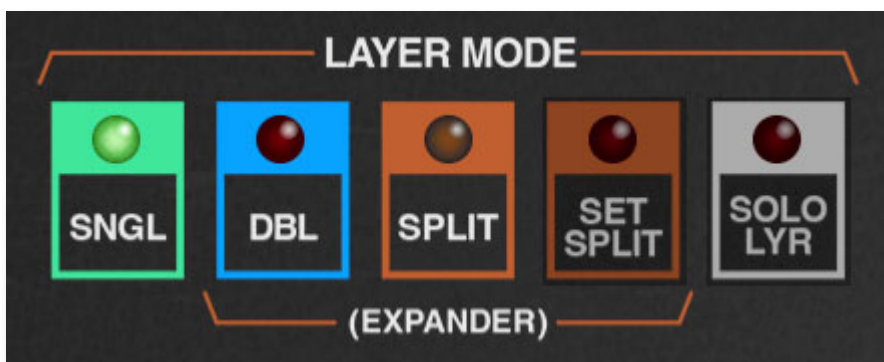
VOICE VOLUME



VOICE VOLUME- These sliders independently set the volume of each voice path. If the Single Layer Patch Config is currently selected, the *B* or *D* slider will be disabled and dimmed. Each of these has a red signal-present LED at the top; these very useful for determining which voice path(s) is currently making sound.

Note that depending on the current Patch Config setting, in some cases the *B* and *D* sliders won't have much (or any) effect.

LAYER MODE



The LAYER MODE section defines overall "single" or "double" behavior as well as configuring splits in DOUBLE mode.

- **SINGLE**- Sets Chroma to play as a single 16-voice instrument, with two voice paths (A and B).
- **DOUBLE**- Sets Chroma to play as two independent 16-voice instruments, with four voice paths - A and B on the bottom Chroma, and C and D on the top Expander.
- **SPLIT/SET SPLIT**- When *SPLIT* mode is enabled, the keyboard is split into two zones. The bottom half of the split plays the bottom Chroma, and the top half of the split plays the Expander.

To set up a split, click the *SPLIT* button, then click *SET SPLIT*. The *SET SPLIT* button will flash. Simply strike the keyboard key where you'd like the keyboard split to be; the *SET SPLIT* button stops flashing the split is set.

- **SOLO LAYER**- Toggle the *SOLO LAYER* buttons to solo either the Chroma or Expander sections when in *DOUBLE* or *SPLIT* modes. When *LAYER MODE* is set to *SINGLE*, the *SOLO LAYER* button is dimmed and disabled.

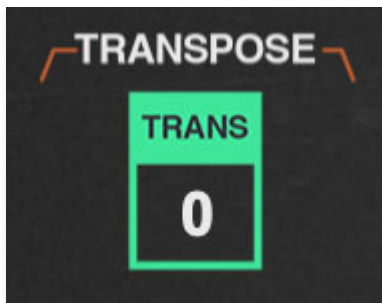
SOLO LAYER should not be confused with Slayer solo, which is when Kerry King plays fast, sloppy, and evil.

NUMBER OF VOICES



NUMBER OF VOICES- Sets the maximum number of voices for the layer, whether set to a poly or mono unison mode. (Set this with the *CONTROL KEYBOARD ALGORITHM* menu.)

TRANSCOPE



TRANSPOSE- The *TRANSPOSE* menu buttons transpose the range of Chroma or Expander up to two octaves up or down. Unlike the *PITCH A/B/C/D RANGE* controls, which only affect one layer at a time, the *TRANSPOSE* section buttons affect the entire Chroma (A/B) or Expander (C/D) for quick octave changes.

UTILITY



The *UTILITY* popup menus allow Chroma and Expander layers to be moved back and forth, independently initialized, and more. They also let you import layers from other Chroma patches.

Note that a number of utility menu options only apply in *DOUBLE* or *SPLIT LAYER MODE*. If *SINGLE* mode is selected, inactive menus will be disabled.

If you accidentally mess anything up with the utility commands, you can always undo with [ALT-Z] (Windows) or [⌘Z] (Mac), or by clicking the counterclockwise undo arrow in the top menu strip.

Unlikes other controls, the Chroma and Expander *UTILITY* buttons are identical, we just put copies in both places (because it looked nicer that way).

- **Swap Chroma and Expander Parameters-** Reverses the locations of the Chroma and Expander layers.
- **Copy Parameters-** Duplicates one layer to the other.
- **Voice Parameters-**

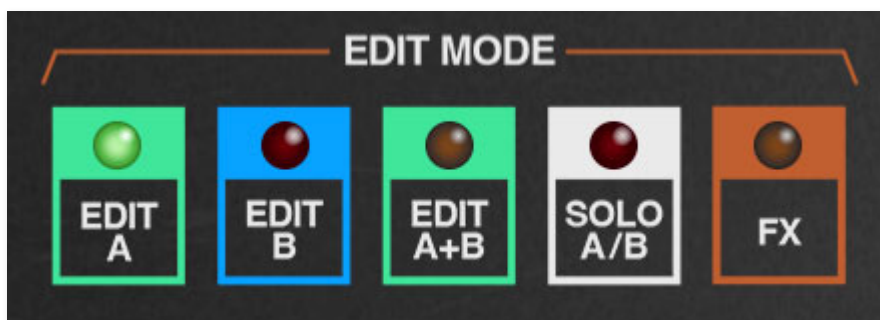
- **Swap A and B**- Reverses the voice path parameters
- **Copy A to B**- Duplicates voice path A's parameters to voice path B. Existing voice path B parameters are overwritten.
- **Copy B to A**- Duplicates voice path B's parameters to voice path A. Existing voice path A parameters are overwritten.
- **Reset Parameters**- Initializes all settings of the selected layer only.
- **Copy Effects**- Duplicates the settings of all effects from one layer to the other; this is only relevant if FX Mode is set to *Dual Layer Effects* on the Chroma EDIT MODE FX page. If FX Mode is currently set to *Global Effects*, the *Copy Effects* menu options will be grayed out.
- **Import/Export**- The Import/Export command allows layers to be moved between sound presets. Data from the source preset isn't affected.

The process is simple:

- Select the source patch in the patch browser in the top purple menu strip.
- Click the *UTILITY* button and select the appropriate *Copy <Chroma or Expander> Parameters to Memory* submenu to copy the layer parameters into the memory buffer.
- Select the destination patch in the patch browser in the top purple menu strip.
- Click the *UTILITY* button and select the appropriate *Paste to <Chroma or Expander> submenu* to load the parameters into the desired layer.

The source patch will not be affected.

EDIT MODE



These buttons determine which voice path (or FX section) is currently being edited with the 50 *PARAMETER PROGRAM* controls.

EDIT A, EDIT B (Chroma), EDIT C, EDIT D (Expander)- These set the voice path that is currently being edited. The orange bracket text above the buttons also changes to indicate the currently edited voice path (e.g., *GLIDE A*, *SWEEP A*, etc. changes to *GLIDE B*, *SWEEP B*, etc.). Additionally, the color of the boxes in the Patch Configuration diagram changes to orange for the current A/B or C/D components, or to orange for both when *EDIT A+B* or *EDIT C+D* is selected.

A+B (Chroma), EDIT C+D (Expander)- We'll explain this one as it applies to the bottom Chroma A and B voice paths, but it works exactly the same for the Expander C and D voice paths:

The *EDIT A+B* button is used to edit both voice paths simultaneously. When *EDIT A+B* is clicked, the most recently selected parameters (A or B) remain displayed. Sound parameters are unaffected, that is, parameters retain their individual settings for each voice path.

When a parameter is edited, the value will snap to the same setting for both voice paths, but only for the parameter that's been edited.

In this way, you won't lose all the parameters settings for the "other" voice path when *EDIT A+B* is selected, and you can freely move back and forth between the *EDIT A* and *EDIT B* modes for parameters you'd like to retain individual control of vs. *EDIT A+B* (for parameters you'd like both voice paths to share).

SOLO A/B (Chroma), SOLO C/D (Expander)- These toggle soloing a particular voice path. This lets you isolate the voice path for easier editing.

Note that the CONTROL section parameters are global for voice paths A/B and C/D, so they don't change when EDIT A or EDIT B (or EDIT C or EDIT D) is selected.

Also, some patch configurations only use one of the voice paths for audio (*Filter FM*, *Parallel Filters*, etc.), so soloing may result in silence (everybody sing along, "Soloing... results... in silence..."). The easiest way to determine if this is happening is to look at the Patch Configuration block diagram at the top; if there's only a single arrow at the right, the Patch Configuration isn't using the B or D voice path.

FX- Allows editing of Chroma's effects section parameters. The EQ and Limiter effects are always global for the entire plug-in (Chroma+Expander) - that's why you'll only see controls for these on the Chroma FX page.

The Distortion, Phaser, Flange/Chorus, Delay, and Reverb effects can be independent for Chroma and Expander or can function as a single set of

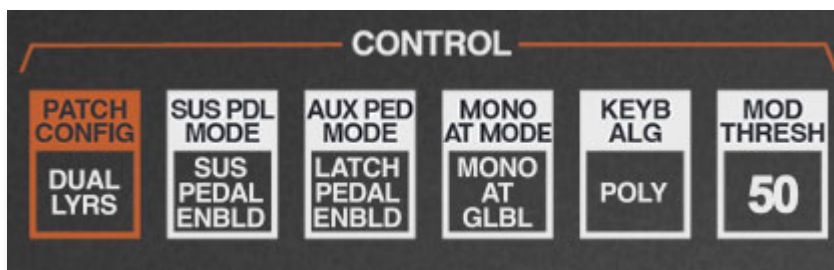
effects applied globally to both layers. This is set with the *FX MODE* button on the Chroma *FX* edit page.

For more information, please see the **FX** section.

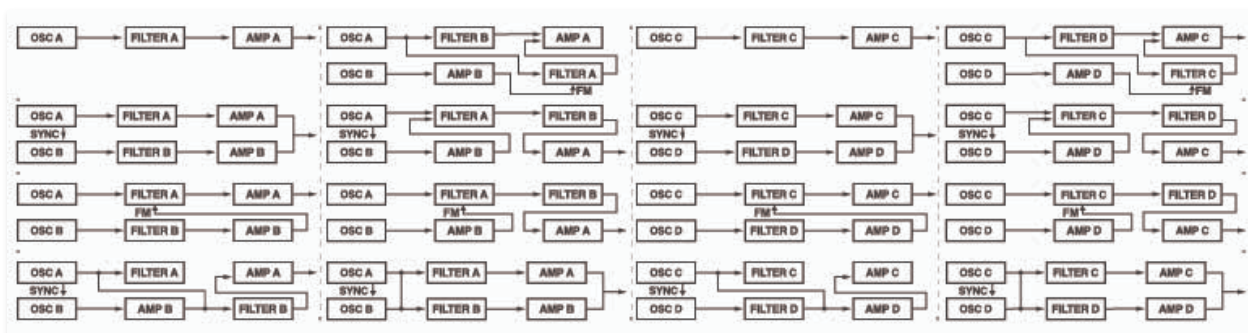


The PARAMETER PROGRAM section contains all of Chroma's sound programming menus and variable controls. In case we hadn't previously mentioned it, the Chroma is REALLY DEEP - kind of like a poly modular synth, meets an Oberheim Expander, combined with a Kurzweil K2000.

In following chapters, we'll go through each PARAMETER PROGRAM section in detail.



The CONTROL section contains what's often referred to as "global" parameters. Unlike all other PARAMETER PROGRAM controls, these apply to *both* voice paths - A/B for the Chroma or C/D for the Expander. This is why the word CONTROL (and most of the buttons) is white.



PATCH CONFIGURATION- This selects how the Chroma's various synthesis "building blocks" are set up - if you're familiar with modular synthesizers, think of PATCH CONFIGURATION as the way the modules are patched together. Generally speaking, PATCH CONFIGURATION is the very first thing you'll want to set when creating a patch.

There are sixteen choices in five categories, ranging from a simple single oscillator>filter>amp setup to elaborate series or parallel dual-filter setups with ring modulation, filter FM and more. For detailed information on each PATCH CONFIGURATION choice, please see [Appendix 1: Patch Configurations](#).

SUSTAIN PEDAL MODE- Sets the behavior of a standard sustain pedal:

- **Sustain Pedal Enabled**- Chroma responds to sustain pedal control. When the sustain pedal isn't down, and keys are released, the envelope generator instantly jumps to the release phase. When the sustain pedal is down and keys are released, notes will complete the entire duration of the envelope decay phase. With this in mind, set DECAy to high setting, and RELEASE to a low setting if you'd like a sound's sustain characteristics to behave in a familiar piano fashion.

- **Sustain Pedal Disabled**- Chroma ignores sustain pedal control.

AUX PEDAL MODE- The original Chroma had inputs for two pedal controllers. In fact, it actually included a fancy dual pedal... in the included flight case... hooray for insanely pricey synths! (fun fact: in 1982 the Rhodes Chroma retailed for \$5295. At the time, that kinda dough would buy a brand-new Chevy Chevette!)

Since some modern MIDI/USB controllers include additional aux pedal inputs (such as the higher-end Arturia and Native Instruments controllers), we retained this feature. Keep in mind that the *AUX PEDAL* control doesn't *have* to be a pedal either - any switched MIDI controller can be assigned by simply right-clicking on the *AUX PEDAL* button in the left-hand controllers section. (For more information on the *AUX PEDAL* button see the **Left-Hand Controls** section. More info on assigning hardware controllers can be found in the **MIDI Controllers Setup and The MIDI Tab** section. So much hot-linking!)

- **Latch Pedal Enabled**- This allows the secondary pedal to hold notes with "no-hands" - it's useful for soloing over a bass note(s) or chords. Here's an example of how to use it:
 - Play and hold a low octave, and press and hold the aux pedal
 - Release the held notes. The notes will continue to sound until the pedal is released, or the envelope decay stage has ended. (it works best when envelope *DECAY* is set to maximum, allowing constant sustain).
 - When notes are held with the sustain pedal, additionally played notes will decay and release normally; that is, only the notes held by the aux pedal will sustain indefinitely.
- **Latch Pedal Disabled**- Disables the latch function.
- **Note Gate**- Notes sound only when pedal is down. This makes the aux pedal behave like a big mute button. It's useful for Double mode patches when you'd like to "bring in" (or exclude) the Chroma or Expander layers.
- **Note Gate Inverted**- The same as Note Gate, but in reverse - notes are silenced when the pedal is down.

AUX PEDAL MODE AND PEDAL POLARITY

When using an aux pedal, more than likely, you'll be using a standard sustain pedal. The polarity of sustain pedals isn't standardized - if you've ever had notes sustain on a synth when the pedal was up, and play normally when the pedal is down, you know what we're talking about.

If the *AUX PEDAL* button to the left of the keyboard nominally appears *down* and goes *up* when you press the aux pedal, your pedal is the wrong polarity. Fortunately, there are three solutions, two of which are super easy:

- Many sustain pedals include a polarity switch. If yours does, flip it the other way, and Bob's your uncle.
- If the pedal doesn't have a polarity switch, the polarity can effectively be reversed in Chroma's MIDI controller assignment tab. We're going to assume you've already assigned the pedal to the *AUX PEDAL* button to the left of the keyboard (if not, right-click the *AUX PEDAL* button, choose *MIDI Learn*, press down the aux pedal, done!).

Click the *MIDI* icon button in the top purple menu strip. Now locate *Aux Pedal* in the *Name* row of the MIDI tab. Turn its little *Min* knob all the way up, and its *Max* knob all the way down. Click the *MIDI* icon button again to close the MIDI controllers tab.

- If for some reason you're not into the preceding options, most USB/MIDI controllers allow pedal polarities to be reversed using their usually-nightmarish onboard menus (or some kind of computer control app you didn't know you had, that will surely need to update itself 17 times, require a login ID and password you don't remember, etc. etc.). So uh... we recommend reversing polarity using one of the other methods.

AFTERTOUCHE (AT) MODE- Determines how Chroma responds to aftertouch controller data. Note that Chroma only responds to mono aftertouch.

- **Mono Aftertouch Global-** Incoming keyboard aftertouch control is summed to one overall control stream.
- **Mono Aftertouch Last Note-** Chroma responds to aftertouch data from only the most recently played note. This rather nifty feature gets very close to imitating true polyphonic aftertouch.

KEYBOARD ALGORITHM- Determines how Chroma assigns notes to synth voices.

- **Polyphonic-** Multiple notes can sound simultaneously, up to a maximum of 16 simultaneous voices. If max polyphony is exceeded, the oldest voice will be "stolen."
- **Poly Pitch Ordered-** Chords are assigned from top note down to the most recently released voices. This works well when glide is enabled.

- **Poly Chord Buffer**- Playing a chord will enter it into memory, but it will not be heard. When the Aux Pedal is pressed, the chord will sound and notes can be played on top (with both hands, hooray). The chord remains in the buffer until all notes are released and the process can be repeated with a new chord whereupon you can continue to ~~bore the audience~~ joyously solo over a different chord.
- **Poly Unison**- This unison mode stacks and divides Chroma's 16 voices dependent upon the number of notes currently played. For example, if one note is played, all 16 unison voices sound. If two notes are played, each 8 voices sound for each note, continuing to divide to by even numbers up to the total 16 voices, which would sound one voice per note (in case you have an excess of fingers, or you're playing the world's most badass version of "Heart and Soul" with a very understanding partner).
If you're using an older computer, be aware that *Poly Unison* can be CPU intensive.
- **Mono, Last Note, Single Trigger**- One note sounds at a time, with priority given to the most recently played note. Single trigger means that the envelope generators will only retrigger if all currently held notes are released. This is useful for legato playing - a good analogy would be sliding your finger up and down a guitar string after plucking a note.
- **Mono, Last Note, Multi Trigger**- One note sounds at a time, with priority given to the most recently played note. Multi trigger means that the envelope generators retrigger every time a new note is played. This is a has more aggressive sound, and is usually good for bass parts. A good analogy here would be uh... Johnny Ramone insistently downstroking every single chord played, then stealing Joey's girlfriend, and them never speaking again, yet remaining in the band together for decades, and uh... maybe we're not that good with analogies?
- **Mono, First Note**- Only the first note is heard when a group of notes is played. This can be useful in DOUBLE where one layer plays full chords, and one emphasizes an "inner" chord note.
- **Mono, Bottom Note**- Only the lowest note is heard when a group of notes is played. Useful in DOUBLE mode if you're playing a chord and you'd like one of the layers to play chords and the other to play bass.
- **Mono, Top Note**- Only the highest note is heard when a group of notes is played. Useful in DOUBLE mode when playing a chord and you'd like only the top (lead) note only to sound on one of the layers.

The Chroma Arpeggiator

Before we delve into the specific arpeggio modes, we'd like to point out some specifics of the Chroma arpeggiator, which is unique in a number of ways:

Typically, an arpeggiator has a range control that sets the upper and lower note-range boundaries. The Chroma arpeggiator does not - the range is set according to notes played. For example, if a simple triad is played, the range would be a fifth: the distance between the bottom and top note of the triad. However, the Chroma arpeggiator "remembers" notes as they're played; in other words, notes don't have to be held to continue sounding in the arpeggio. In this way, if you wanted to play a triad over a two-octave range, you could play the initial three-note chord, release the notes, then play the same triad an octave higher, and all two octaves of notes would continue to play. The only caveat is that at least *one* note must be continuously held, or the arpeggio sequence is reset. Unlike most arpeggiators, newly added notes do not repeat in octaves - only specifically played notes are added to the arpeggio sequence. The arpeggiator "resets" and clears all notes when all notes are released.

The other unique thing about the Chroma arpeggiator is that individual notes respond to and retain velocity data. For example, if three notes of a chord are played in succession with the first two struck very lightly, and the last note struck hard, the arpeggiator remembers each note's velocity and plays it back with the velocity it was initially struck with. This results in musically interesting, dynamic arpeggio sequences.

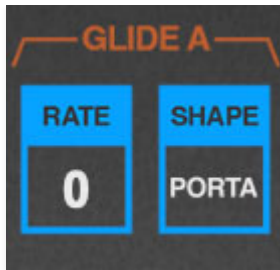
Finally, as the arpeggiator options are contained within the KEYBOARD ALGORITHM menu, there is no rate control. Arpeggiator rate is determined by the SWEEP A *RATE* control (or SWEEP C *RATE* on the Expander).

- **Arpeggiator Up**- All entered notes play in ascending order.
- **Arpeggiator Down**- All entered notes play in descending order.
- **Arpeggiator Up/Down**- All entered notes ascend then descend.
- **Arpeggiator Down/Up**- All entered notes descend then ascend.
- **Arpeggiator Sequencer**- Notes play back in the order they are entered in and loop. The length of the arpeggio is the total number of notes entered. Like the other arpeggio modes, once a note is played, it can be released and will continue to play as part of the sequence as long as at least one note is held. When all notes are released, the arpeggio pattern stops and the sequence is "reset."

- **Arpeggiator Random**- All entered notes play back in a random pattern.

MOD THRESHOLD- This is one of Chroma's more unusual features; it works in conjunction with mod sources as a preset comparator. In other words, "if control signal is above a certain level, then do <thing here>." Following is a list of mod sources that mod threshold works with... we even made a fancy table:

PARAMETER PROG SECTION	PARAMETER	MOD THRESHOLD FUNCTION
ENVELOPE 1/2	AMPLITUDE TOUCH/Threshold	notes audible when played with velocity greater than THRESHOLD setting
ENVELOPE 1/2	AMPLITUDE TOUCH/Threshold Inverted	notes silenced when played with velocity greater than THRESHOLD setting
PITCH	MOD <1,2,3> SELECT/Threshold Velocity	MOD <1,2,3> DEPTH CV summed with pitch when notes played with velocity greater than THRESHOLD setting
WAVE SHAPE	MOD SELECT/Threshold Velocity	MOD <1,2,3> DEPTH CV summed with WIDTH setting when notes played with velocity greater than THRESHOLD setting
FILTER	MOD <1,2,3> SELECT/Threshold Velocity	MOD <1,2,3> DEPTH CV summed with CUTOFF setting when notes played with velocity greater than THRESHOLD setting



Glide slows down the transition of note pitches - think of the sliding pitches of a violin or a trombone (on second thought, no one should think of a trombone).

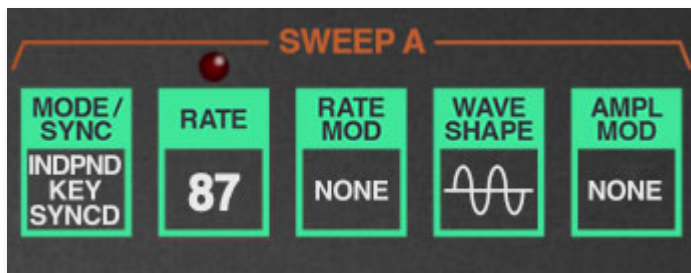
RATE- Sets the overall glide or portamento speed. with higher settings corresponding to longer times.

SHAPE- Defines glide behavior as follows:

- **Portamento**- Pitch changes smoothly between notes.
- **Glissando**- Pitch changes in 1/2 step increments, as if playing chromatically up or down the keyboard.

- **Aux Pedal Enables Glide**- When toggled, glide will only be on when the Aux Pedal is pressed. For more info on setting up the AUX PEDAL button and/or pedal, please see the **Left-Hand Controls/Aux Pedal Button** section. *GLIDE RATE* must be set to a non-zero level.

SWEEP is Chroma terminology for a low-frequency oscillator, which is a sub-audio range modulation source commonly used for pitch modulation (i.e. vibrato or trills), timbral mod (pulse-width mod), filter cutoff mod (for wah-wah effects), or amp modulation (tremolo).



MODE/SYNC- Configures LFO reset and sync behavior.

- **Asynchronous Free Running**- Each key played has its own free-running LFO and does not reset. The mod rate for each key varies slightly for more natural sounding mod cycles (hence the "asynchronous" terminology).
 - **Independent Key Synced**- Each key played has its own LFO that resets with each keystroke.
 - **Single Free Running**- A single LFO is shared for all notes and does not reset.
 - **Single Key Synced**- A single LFO is shared for all notes and resets any time a new note is played.
-
- **Sync To Host Tempo**- This syncs the LFO to host tempo when using Chroma within DAW software, or to the current tempo in the top menu bar when using the standalone version. The RATE control will snap from 8 beats up to 1/64th note triplets.

RATE- Sets sweep speed , from 0.12 to 11.91 Hz (with *MODE/SYNC Sync To Host Tempo* disabled). The LED above the RATE control flashes at the current modulation rate.

RATE MOD- Allows the sweep rate to be modulated by the following mod sources:

- **None**- No rate modulation applied.
- **Aftertouch (Mono+Poly)**- Sweep rate accelerates when keys are pressed harder with aftertouch.


- **Keyboard**- Sweep rate increases as higher notes are played on the keyboard.
- **Keyboard Inverted**- Sweep rate decreases as higher notes are played on the keyboard.
- **Velocity**- Playing harder increases the sweep rate.
- **Velocity Inverted**- Playing harder decreases the sweep rate.
- **Envelope 2**- Sweep rate increases as ENVELOPE 2 voltage increases.
- **Envelope 2 Inverted**- Sweep rate decreases as ENVELOPE 2 voltage increases.
- **Controller 1**- Sweep rate increases as CONTROLLER 1 left-hand control is increased (pushed up).
- **Controller 1 Inverted**- Sweep rate decreases as CONTROLLER 1 left-hand control is increased (pushed up).
- **Controller 2**- Sweep rate increases as CONTROLLER 2 left-hand control is increased (pushed up).
- **Controller 2 Inverted**- Sweep rate decreases as CONTROLLER 2 left-hand control is increased (pushed up).
- **Mod Wheel**- Sweep rate increases as the mod wheel left-hand control is increased (pushed up).
- **Mod Wheel Inverted**- Sweep rate decreases as the mod wheel left-hand control is increased.
- **Pitch Bend**- Sweep rate increases as the pitch bend wheel left-hand control is increased.
- **Pitch Bend Inverted**- Sweep rate decreases as the pitch bend wheel left-hand control is increased.

WAVE SHAPE- Selects from the following wave shapes:

Sine 

Cosine 


Offset Sine 

Half Sine 

Triangle A 

Triangle B 

Sawtooth 

Lag Square 

Square 

Pattern A 

Pattern B 

Pattern C 

Pattern D 

Pattern E 

Pattern F 

Random 

AMPLITUDE MOD- This mod destination determines the amount or level of SWEEP mod. Think of this as a "pre" modulation control, that is, controlling the mod level *before* mod destinations.

- **None**- No rate modulation applied.

- **Aftertouch (Mono+Poly)**- Sweep amount increases when keys are pressed harder with aftertouch.
- **Keyboard**- Sweep amount increases as higher notes are played on the keyboard.
- **Keyboard Inverted**- Sweep amount decreases as higher notes are played on the keyboard.
- **Velocity**- Playing harder increases the sweep amount.
- **Velocity Inverted**- Playing harder decreases the sweep amount.
- **Envelope 1**- Sweep amount increases as ENVELOPE 1 voltage increases.
- **Envelope 2**- Sweep amount increases as ENVELOPE 2 voltage increases.
- **Controller 1**- Sweep amount increases as CONTROLLER 1 left-hand control is increased (pushed up).
- **Controller 2**- Sweep amount increases as CONTROLLER 2 left-hand control is increased (pushed up).
- **Mod Wheel**- Sweep amount increases as the mod wheel left-hand control is increased.
- **Pitch Bend**- Sweep amount increases as the pitch bend wheel left-hand control is increased.
- **0.85, 1.3, 2.6, 5.1 Second Delay**- Sweep amount increases gradually and stays at maximum according to the time selected. Just the thing for playing "*True*" by Spandau Ballet - originally recorded with a Chroma... we know this much is... TRUE!

USING AMPLITUDE MOD TO SET UP MOD WHEEL-CONTROLLED VIBRATO, TREMOLO, ETC.

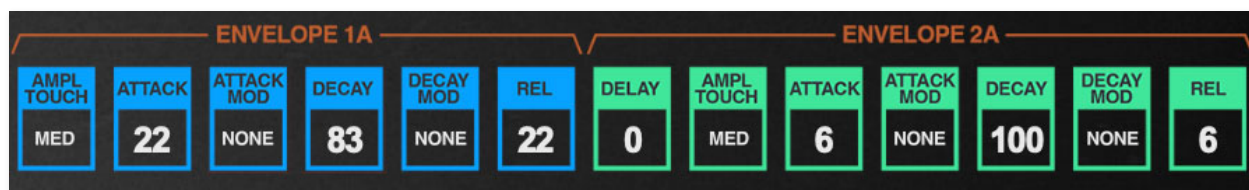
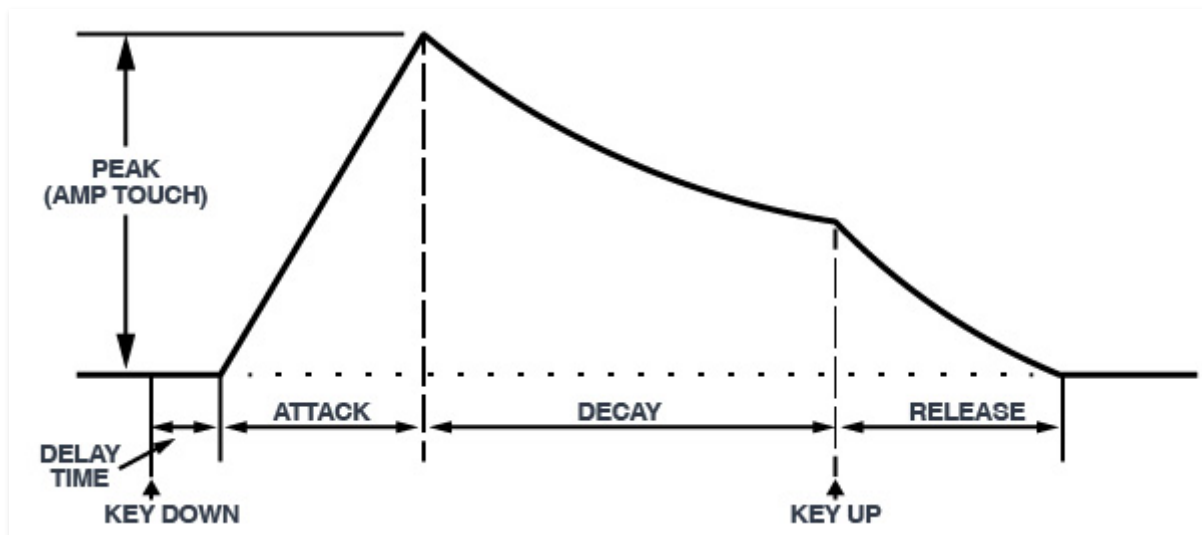
In this example, we'll configure Chroma for vibrato (i.e. pitch mod) controlled via the mod wheel, but any other continuous hardware controller can be used.

If you were to simply set the PITCH section's MOD SELECT to SWEEP A, and raise its companion MOD DEPTH setting above 0, you'd hear constant pitch modulation. In other words, you'd have no way to control the mod amount in real time.

Setting the SWEEP section AMPLITUDE MOD to MOD WHEEL allows the mod wheel to control modulation depth. If the mod wheel is zeroed, then no modulation occurs; as the mod wheel is raised, more modulation occurs. The

MOD DEPTH control in the target section can be used to limit the amount of mod depth.

A voice path includes two independent envelope generators. These are similar to a conventional attack/decay/sustain/release (ADSR) envelope generator, but they don't have a dedicated sustain phase. However increasing the *DECAY* setting to 100% sets the sustain level to max, resulting in an ASR envelope. The diagram below illustrates Chroma envelope functionality:



Chroma's envelope generators are identical with the exception that ENVELOPE 2 adds a delay stage.

DELAY (Envelope 2 only)- Delays the onset of the attack stage by up to 1265 ms.

Setting *DELAY* to maximum setting puts envelope 2 in *Retrigger on Sweep A* mode; this triggers envelope 2 every time the sweep resets. This setting works best when the keyboard is set to one of the mono modes (in the *CONTROL KEYBOARD ALGORITHM* menu), otherwise things can get messy, because there are 16 individual LFOs triggering voices at once.

AMPLITUDE TOUCH- Defines how much the envelope affects note amplitude via keyboard velocity. You can think of the settings in a sort of backwards way - the higher the setting, the quieter sounds will be when playing really lightly, and the harder you'll need to play for sounds to be loud.

- **None**- Keyboard velocity has no effect on envelope.
- **Low**- Low sensitivity.
- **Medium Low**- Medium-low sensitivity.
- **Medium**- Medium sensitivity.
- **Medium High**- Medium-high sensitivity.
- **High**- High sensitivity.
- **Threshold**- Threshold allows notes to be heard at full velocity when velocity exceeds the a certain setting; below the threshold, no sound will be heard. The threshold level is set using the *MOD THRESHOLD* control in the CONTROL section. Threshold is useful in double mode pages where you'd like to add a layer by playing harder (or vice-versa using the *Threshold Inverted* setting below).
- **Threshold Inverted**- As the name implies, this is the inverse of the preceding *Threshold* setting. Notes are heard only when played with a velocity less than the CONTROL section *MOD THRESHOLD* setting.

ATTACK- Defines the length of time for amplitude to rise from zero to full scale when a key is played, ranging from 0 to 10,000 ms.

ATTACK MOD- Allows attack time to be modulated via the sources below. Positive modulation decreases the attack time.

- **None**- No attack modulation applied.
- **Aftertouch (Mono+Poly)**- Attack time decreases when aftertouch is applied. This is kind of a weird one, because attack is generally associated with the instant a key is played, and aftertouch can only occur after a note is played. The result is that notes with slow attack times can be "sped" up and brought up to max volume more quickly using aftertouch. Try it!
- **Keyboard Inverted**- Attack decreases as higher notes are played on the keyboard.
- **Keyboard**- Attack increases as higher notes are played on the keyboard.
- **Velocity**- Playing harder decreases the attack time.
- **Velocity Inverted**- Playing harder increases the attack time.
- **Controller 1**- Attack time decreases as CONTROLLER 1 left-hand control is increased (pushed up).

- **Controller 2**- Attack time decreases as CONTROLLER 2 left-hand control is increased (pushed up).

DECAY- Defines the length of time for amplitude to fall from the attack stage peak to zero if a key is held. If the key is released before the decay phase is over, it will jump to the release phase upon key release. Decay time range is from 0-35,000 ms. At max setting, notes will stay at full amplitude as long as a note is held, essentially converting the envelope generator to an ASR (attack/sustain/release) envelope. The popup tooltip displays *Sustain 100%* to reflect this.

DECAY MOD- Allows decay time to be modulated via the sources below. Positive modulation increases the decay time.

- **None**- No decay modulation applied.
- **Aftertouch (Mono+Poly)**- Decay time increases when aftertouch is applied.
- **Keyboard**- Decay time increases as higher notes are played on the keyboard.
- **Keyboard Inverted**- Decay time decreases as higher notes are played on the keyboard.
- **Velocity**- Playing harder increases the decay time.
- **Velocity Inverted**- Playing harder decreases the decay time.
- **Controller 1**- Decay time increases as CONTROLLER 1 left-hand control is increased (pushed up).
- **Controller 2**- Decay time increases as CONTROLLER 2 left-hand control is increased (pushed up).

RELEASE- Defines the length of time for amplitude to fall to zero once a key is released. Times range from 0-35,000 ms.



Each voice path includes a single oscillator; initial tuning and modulation are set in the PITCH section.

RANGE- Sets the coarse pitch range for each oscillator in semitone intervals from -12 to +51. We didn't make up these somewhat odd settings; they're straight from the original instrument. We suspect the far-greater upper range was implemented to best take advantage of Chroma's ring modulation and oscillator sync capabilities.

FINE TUNE- Sets the fine tuning up or down one semitone in cents. This useful for detuning when stacking oscillators.

MOD 1/2/3 SELECT- These configure pitch frequency modulation. Most of these are self-explanatory, so we've included notes only where necessary. Note that none of these mod sources have "inverted" options, because their associated mod depth controls are bipolar - for inverted modulation, simply set the appropriate DEPTH control to a negative value.

Keyboard Glide A- Slew keyboard CV is used as a mod source (GLIDE RATE control must be set to a non-zero level).

- **Sweep A**
- **Envelope 1A**
- **Envelope 2A**
- **Keyboard Glide B**
- **Sweep B**
- **Envelope 1B**
- **Envelope 2B**
- **Mod Wheel**
- **Pitch Bend**
- **Controller 1**
- **Controller 2**
- **Velocity**

- **Threshold Velocity**- Switches between two discrete pitch mod amounts according to velocity. The velocity threshold is set using *MOD THRESH* in the CONTROL section.
- **Keyboard**- Sweep rate increases as higher notes are played on the keyboard.
- **Keyboard Inverted**- Sweep rate decreases as higher notes are played on the keyboard.
- **Velocity**- Playing harder increases the sweep rate.
- **Velocity Inverted**- Playing harder decreases the sweep rate.
- **Aftertouch (Mono+Poly)**
- **Threshold Aftertouch**- Switches between two discrete pitch mod amounts according to aftertouch. The aftertouch threshold is set using *MOD THRESH* in the CONTROL section.

MOD 1/2/3 DEPTH- Sets the amount of mod from the same-numbered mod source.

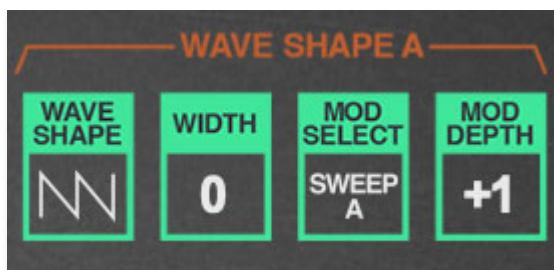
Note that *MOD 3 DEPTH*'s range differs from the others - instead of ranging from -100 to +100%, it ranges from -64 to +64 in half-step increments. This was done to simplify setting bend depth when assigning the pitch bend wheel. (Unlike most synths, the Chroma doesn't have a "hard-wired" mod bus for pitch bend.)

IMPORTANT NOTE ABOUT PITCH MOD - YOU REALLY SHOULD READ THIS

Now that we have your attention... we wanted to be sure users were aware of another of Chroma's unusual quirks. Each of the three PITCH section mod buses has a different mod range and max setting as follows:

- **MOD 1**- major 3rd
- **MOD 2**- octave+major 3rd
- **MOD 3**- five octaves+major 3rd

The idea behind is was that the three mod buses would be used for different applications, depending upon the range needs. For example, MOD 1 could be used for subtle vibrato via the sweep section, where only a very limited amount of pitch deviation was necessary. MOD 2 might be used for siren effects, and MOD 3 could be used with the sync or ring mod patch configuration settings, when very wide pitch changes are desired.



WAVE SHAPE- Selects the oscillator waveform. Each oscillator includes triangle, sawtooth, square, variable pulse.

- **Sawteeth-** That's not a typo - the "sawteeth" wave is a combined sawtooth and pulse wave, with timbre adjusted by the adjacent WIDTH control. Set WIDTH to 0 for a standard sawtooth wave. As the WIDTH control is moved, additional harmonics are audible and appear as additional "teeth" when viewed on an oscilloscope. A width setting of 50% results in a "doubled" sawtooth wave; that is, a standard sawtooth sounding one octave higher.

The width control can be modulated just as you would when applying pulse-width modulation to a square wave for dynamic timbral movement.

- **Pulse-** Adjustable-width pulse wave.
- **Pink Noise-** A random signal in which each octave across the frequency spectrum is represented equally. Pink noise sounds a littler duller and bassier than white noise.
- **White Noise-** A random signal in which all frequencies across the frequency spectrum are represented equally.

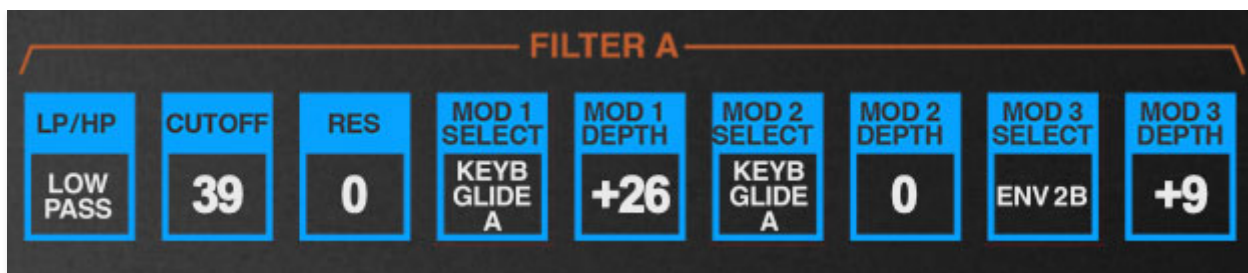
WIDTH- When WAVE SHAPE is set to *Sawteeth*, this sets the width or "duty-cycle" of the pulse wave that's combined with saw (explained in the preceding *Sawteeth* section); when WAVE SHAPE is set to *Pulse*, sets the width of the pulse wave. Set WIDTH to 50% for a perfect square wave. At extreme width settings, no sound will be heard; this is a useful sound programming trick for turning sound on or off using modulation sources.

MOD SELECT- These configure wave form width modulation. Most of these are self-explanatory, so we've included notes only where necessary. Note that none of these mod sources have "inverted" options, because their associated mod depth controls are bipolar - for inverted modulation, simply set the appropriate DEPTH control to a negative value.

- **Keyboard Glide A-** Slewled keyboard CV is used as a mod source (GLIDE RATE control must be set to a non-zero level).

- **Sweep A**
- **Envelope 1A**
- **Envelope 2A**
- **Keyboard Glide B**
- **Sweep B**
- **Envelope 1B**
- **Envelope 2B**
- **Mod Wheel**
- **Pitch Bend**
- **Controller 1**
- **Controller 2**
- **Velocity**
- **Threshold Velocity**- Switches between two discrete wave width amounts according to velocity. The velocity threshold is set using *MOD THRESH* in the CONTROL section.
- **Keyboard**- Width amount increases as higher notes are played on the keyboard.
- **Keyboard Inverted**- Width amount decreases as higher notes are played on the keyboard.
- **Velocity**- Playing harder increases width amount.
- **Velocity Inverted**- Playing harder decreases width amount.
- **Aftertouch (Mono+Poly)**- Width amount increases with aftertouch pressure.
- **Threshold Aftertouch**- Switches between two discrete wave width amounts according to aftertouch. The aftertouch threshold is set using *MOD THRESH* in the CONTROL section.

MOD DEPTH- Sets the amount of width modulation from the current source selected with MOD SELECT.



The original Chroma filter made use of CEM3350 chips, which were dual 12 dB/octave state-variable filters ("state-variable" meaning they could be configured as a lowpass filter, a highpass filter, or Maine or Delaware). One "block" in a Chroma voice path equates to a single 12 dB/octave filter which can be set to lowpass or highpass mode. These can be combined to create bandpass or notch filters, or a steeper 24/dB octave slope using Chroma's flexible Patch Configurations.

About Filter Types

- A lowpass filter allows frequencies *below* the cutoff frequency setting to pass through, but blocks frequencies *above* the cutoff frequency.
- A highpass filter is the opposite of lowpass mode: high-frequency content remains, but low frequencies are removed as the cutoff frequency increases.
- Bandpass filters combine both lowpass and highpass modes, leaving sound only "in the middle" with amplitude falling off symmetrically on either side of the cutoff frequency.
- A variable-speed pool filter is the thing that some scumbag stole from outside my house in Las Vegas, and this is a not-uncommon example of why I moved very far away from Vegas.

Controls

LP/HP-

- **Lowpass**- Sets the filter to lowpass mode.
- **Highpass**- Sets the filter highpass mode.

CUTOFF- Sets the frequency where frequency attenuation begins, i.e. which frequencies are allowed to pass, dependent on the current *LP/HP* setting.

RESONANCE- Resonance emphasizes sound energy at and around the current cutoff frequency by adding feedback from the filter's output back to its input. At lower settings, this can be used to create mild resonances such

as those heard in acoustic instruments. At extreme settings, it can be used as a sine wave generator, but be careful as high resonance settings can result in loud, screamy, dog-spooking (and speaker blowing) occurrences.

MOD 1/2/3 SELECT- These configure filter cutoff frequency modulation. Most of these are self-explanatory, so we've included notes only where necessary. Note that none of these mod sources have "inverted" options, because their associated mod depth controls are bipolar - for inverted modulation, simply set the appropriate DEPTH control to a negative value.

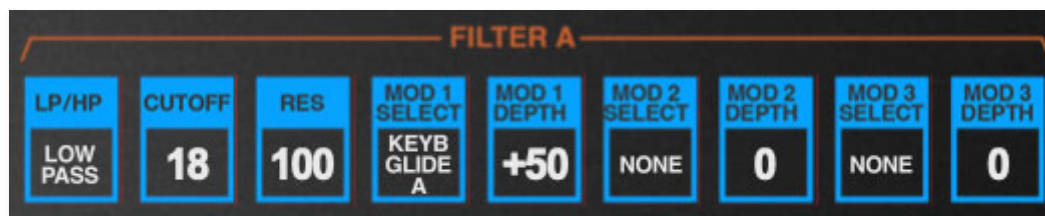
- **Keyboard Glide A**- Slew keyboard CV is used as a mod source (GLIDE RATE control must be set to a non-zero level).
- **Sweep A**
- **Envelope 1A**
- **Envelope 2A**
- **Keyboard Glide B**
- **Sweep B**
- **Envelope 1B**
- **Envelope 2B**
- **Mod Wheel**
- **Pitch Bend**
- **Controller 1**
- **Controller 2**
- **Velocity**
- **Threshold Velocity**- Switches between two discrete mod amounts according to velocity. The velocity threshold is set using *MOD THRESH* in the CONTROL section.
- **Keyboard**- Sweep rate increases as higher notes are played on the keyboard.
- **Keyboard Inverted**- Sweep rate decreases as higher notes are played on the keyboard.
- **Velocity**- Playing harder increases the sweep rate.
- **Velocity Inverted**- Playing harder decreases the sweep rate.
- **Aftertouch (Mono+Poly)**

- **Threshold Aftertouch**- Switches between two discrete mod amounts according to aftertouch. The aftertouch threshold is set using *MOD THRESH* in the CONTROL section.

MOD 1/2/3 DEPTH- Sets the amount of mod from the same-numbered mod source.

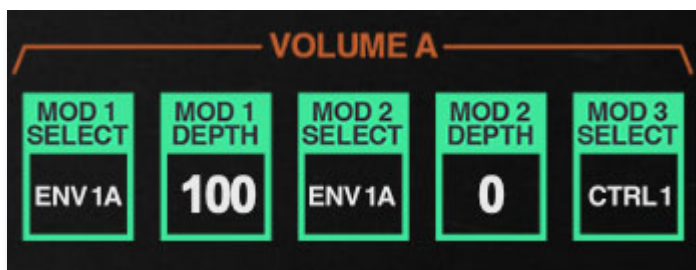
HOW TO APPLY KEYBOARD TRACKING TO FILTER CUTOFF FREQUENCY

Most analog synths include a keyboard tracking control (or fixed amount switches). Since the frequency of note pitches obviously rise or fall depending on the pitches of notes played, the idea is that the filter cutoff frequency follows or "tracks" the pitches of notes played so that the relative brightness (or dullness) of notes remains relatively constant across the range of the keyboard.



Looking at Chroma's filter controls, you'll see there is no tracking control, but there actually *is* way to create filter tracking, it's just not super obvious (kind of a repeating theme with the Chroma!). Setting a mod source to *Keyboard Glide* applies the keyboard CV to the filter cutoff frequency. It's a little confusing, because the GLIDE section *GLIDE RATE* control can be set to zero and filter cutoff frequency mod still works properly.

Setting *MOD DEPTH* to *50* results in almost-perfect 1/2 step tracking. This lets you use the filter as a sine wave oscillator when *RESONANCE* is at high settings (careful with volume, this can get potentially get squealy-screechy).



The VOLUME section defines how envelopes generators and other level modulation is applied to shape the amplitude of sounds using a voltage-controlled amplifier (VCA). If you're not familiar with them, think of a VCA as a simple volume knob that gets automatically turned using control voltages.

This section includes three mod select/depth pairs; these are configured a little differently than the previously discussed PITCH, WAVE SHAPE, and FILTER mod sections:

MOD 1/2 SELECT- These allow envelope generators to be assigned to the VOLUME section VCA. These are used to shape the amplitude curve of notes when keys are played.

- **Envelope 1A**
- **Envelope 2A**
- **Envelope 1B**
- **Envelope 2B**

MOD 1/2 DEPTH- Sets the amount amplitude modulation from the current envelope generator chosen with MOD SELECT. For most sounds using a single envelope generator, you'll want to set the mod depth to 100.

MOD 3 SELECT- The MOD 3 bus is intended for applying amplitude-related effects or additional control, such as tremolo, or volume control via aftertouch. It doesn't have a depth control - it's always at 100%.

CONTROLLING NOTE VOLUME WITH VELOCITY

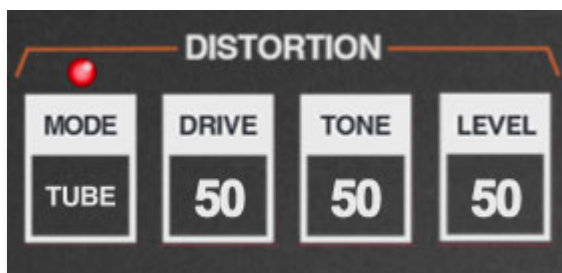
You may have noticed that the VOLUME modulation source lists does not include velocity. Huh? That's because velocity amount is set using the AMPLITUDE TOUCH parameters in the ENVELOPE sections - this sets the amount of keyboard velocity *before* envelope control signals reach the VOLUME (VCA) section.



Chroma includes seven studio-quality onboard effects (we're not sure *who's* studio, but take our word, it's a nice one). The Distortion, Phaser, Flange/Chorus, Delay, and Reverb effects can be independent for Chroma and Expander or can function as a single set of effects applied globally to both layers. The EQ and Limiter effects are always global for the entire instrument.

EDITING FX

The FX section has its own dedicated PARAMETER PROGRAM page. To display the FX page, click the orange *FX* button in the EDIT MODE section on the left. In the following sub-sections, we'll go over each individual effect.



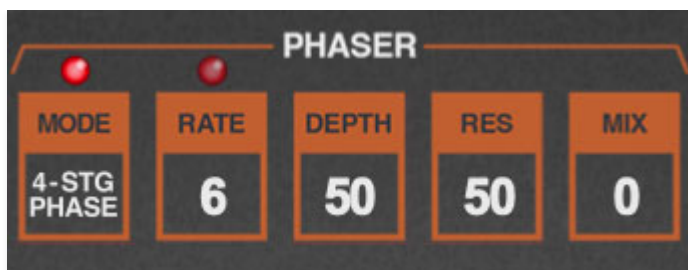
MODE- Turns distortion on and off and sets the type. The LED above the MODE button illuminates when distortion is enabled.

- **Off**- Distort effect is disabled.
- **Tube**- Relatively mellow distortion mode. Use it to add just little bit of vintage hair to sounds.
- **Fuzz**- Aggressive and raunchy vintage fuzz tone.

DRIVE- Overall amount of distortion.

TONE- Sets the brightness of tone.

LEVEL- Sets overall volume; this doesn't affect the amount of distortion. Increasing drive will cause an overall volume increase, *Level* can used to balance levels.



MODE- Turns the phaser on and off and sets the phasing type and sync. The LED above the MODE button illuminates when the phaser is enabled.

- **Off**- Phaser effect is disabled.
- **2-Stage Phaser**- Two stages of of allpass filters.
- **4-Stage Phaser**- Four stages of of allpass filters.
- **6-Stage Phaser**- Six stages of of allpass filters.
- **8-Stage Phaser**- Eight stages of of allpass filters.

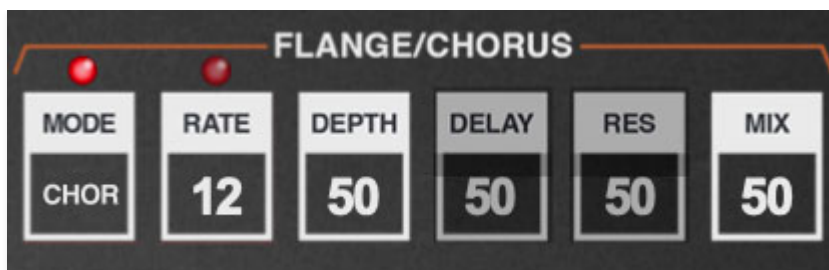
- **Sync To Host Tempo**- Enabling this syncs the phaser's mod rate to host tempo when using Chroma within DAW software, or to the current tempo in the top menu bar when using the standalone version. The RATE control will snap from 8 beats up to 1/64th note triplets.

RATE- Sets the phaser's internal LFO speed from 0.01 to 8 Hz. The LED above flashes to indicate the current mod rate.

DEPTH- Sets the depth of phaser sweep.

RESONANCE- Increasing the amount of *Res* intensifies the phasing effect. This is sometimes referred to as "feedback" in other phaser units.

MIX- Not usually seen in phaser units, the *Mix* control allows the overall phase intensity to be dialed back when desired. For standard "phasers on stun!" behavior, leave *Mix* at 100.



A thick and warm flange/chorus effect. Flanging and Chorus are closely related - the general difference being that flangers use a shorter time range and some amount of feedback (this intensifies the "jet-flyby" whoosh), whereas choruses utilize a slightly longer delay time, and no feedback.

MODE- Turns the flange/chorus on and off and sets the effect type and sync. The LED above the MODE button illuminates when the flange/chorus is enabled.

- **Off**- Flange/chorus effect is disabled.
- **Flange**- Enables flange mode.
- **Chorus**- Enables chorus mode.

- **Sync To Host Tempo**- Enabling this syncs the flange/chorus mod rate to host tempo when using Chroma within DAW software, or to the current tempo in the top menu bar when using the standalone version. The RATE control will snap from 8 beats up to 1/64th note triplets.

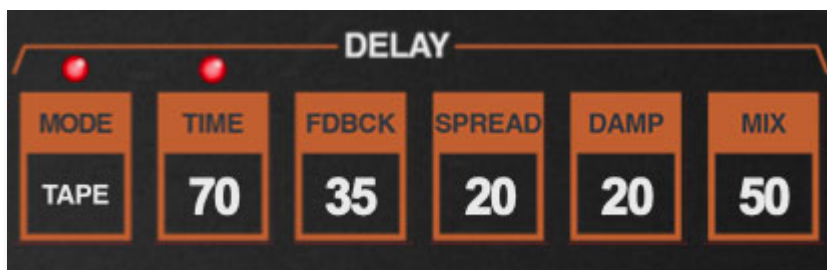
RATE- Sets the flange/chorus internal LFO speed from 0.01 to 8 Hz. The LED above flashes to indicate the current mod rate.

DEPTH- Sets the depth of flange or chorus sweep.

DELAY- Sets the amount of delay time when in flange mode, from 1-13ms. This is disabled in chorus mode.

RESONANCE- Increasing the amount of *Res* intensifies the effect when in flange mode. This is also disabled in chorus mode.

MIX- The *Mix* control allows the overall effect intensity to be dialed back when desired. For standard flange/chorus effect behavior, leave *Mix* at 100.



MODE- Turns the delay effect on and off and sets the type and sync. The LED above the MODE button illuminates when the delay is enabled.

- **Off**- Disables delay effect.
- **Digital**- A pristine sounding digital delay.
- **Tape**- Reproduces the effect of a vintage "space echo" tape delay.
- **Ping Pong**- Echoes alternate between audio channels.

- **Sync To Host Tempo**- Enabling this syncs the delay time to host tempo when using Chroma within DAW software, or to the current tempo in the top menu bar when using the standalone version. The RATE control will snap from 8 beats up to 1/64th note triplets.

TIME- Sets delay time, from 1 to 2000 ms. If the *Sync* button is enabled, time settings snap to synchronized note values.

FEEDBACK- Routes the output to the input for additional repeats. Be careful at high settings as this can result in runaway feedback madness.

SPREAD- Alters the left and right channel delay times creating a stereoizing effect. Greater amounts of spread increase the delay time differential and thus the stereo separation.

DAMP- Attenuates high-frequencies as the knob amount is increased. Not only does this create more natural sounding decays, it also reduces the "stacking" effect that occurs with high feedback levels.

MIX- Sets the ratio of clean to effected sound.



MODE- Turns the reverb effect on and off and sets the type. The LED above the MODE button illuminates when reverb is enabled.

- **Off**- Disables reverb effect.
- **Spring**- Recreates mechanical spring-reverb effect often seen (and kicked) in vintage guitar amps. We don't recommend kicking your computer.
- **Plate**- A medium-to-large studio plate-style algorithm.
- **Room**- Recreates a vintage algorithmic-style medium room verb.
- **Hall**- A large, hall-style reverb.
- **Galactic**- Cherry Audio's exclusive, giant, spacey reverb. Guaranteed to make anything sound cool!™.

DECAY- Sets the length of reverb release time/size of room.

HP- A highpass filter affecting wet reverb signal only. Low frequencies are increasingly attenuated as the setting is increased.

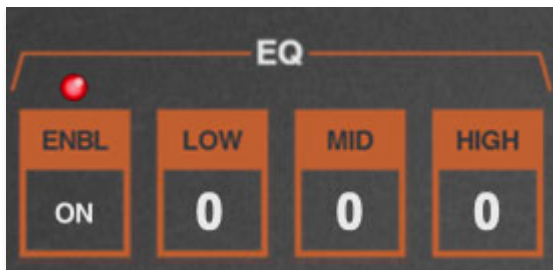
LP- A lowpass filter affecting wet reverb signal only. High frequencies are increasingly attenuated as the setting is decreased.

MIX- Sets the ratio of clean to effected sound.



MODE- This allows selection of either a common or individual set of distortion, phaser, flange/chorus, delay, and reverb effects for Chroma (A/B layers) and Expander (C/D layers). **The EQ and limiter effects are always global for the both Chroma and Expander layers.** This is why the EQ and limiter are only visible on the Chroma FX page.

- **Global Effects-** Both Chroma (A/B layers) and Expander (C/D layers) run through a single set of effects. This is useful when you'd like the same effects settings for both layers when creating stacked (DOUBLE MODE) or split patches.
- **Dual Layer Effects-** Chroma (A/B layers) and Expander (C/D layers) each run through independent effects sections. If you're using an older computer, be aware that *DUAL LAYER EFFECTS* is more CPU intensive.



The EQ section precisely replicates the frequency and boost and cut characteristics of the original Chroma's three-band EQ - this is why some of the specs may look a little odd compared to more modern general-purpose EQ sections.

ENABLE- Turns the EQ section on and off. The LED above the button illuminates when the limiter is enabled.

LOW- Low-shelf filter with a corner frequency of 200 Hz, and up to 12 dB of boost or cut.

MID- Peaking EQ with a center frequency of 3000 Hz, bandwidth of four octaves, and up to 10 dB of boost or cut.

HIGH- High-shelf filter with a corner frequency of 3000 Hz, and up to 7.5 dB of boost or cut.



The limiter globally applies a transparent limiting effect to help prevent ugly digital overloading and clipping. The LED above the button illuminates when the limiter is enabled.

Enable- Turns the limiter on and off.

The left-hand control section of the original Chroma was a little different than the standard pitch and mod wheel setup. Its left-hand controls consisted of simply of two spring-loaded, self-centering arced "paddle" controls, colorfully named "1" and "2." These were included as sources in most of Chroma's mod source menus, allowing them to be configured as standard pitch and mod controls, or much more.

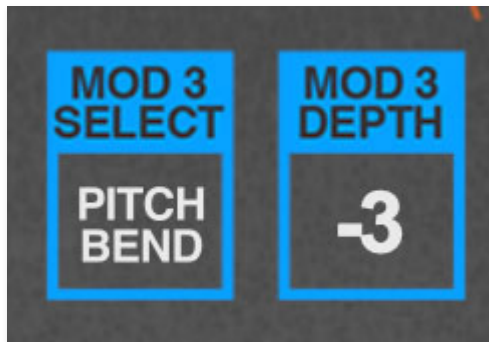
In Cherry Audio's Chroma, we made some changes and added a few controls to better accommodate modern MIDI/USB controllers.



PITCH- The PITCH paddle operates like most pitch wheels you've encountered, but with one difference. Unlike most synths, its control signals are *not* hard-wired to the oscillators; it needs to be set up in a mod bus to function. The good news is that it's already set up in the vast majority of Chroma's presets (including the default patch that loads when the NEW button at top left.) The other good news is that the pitch paddle controller signals can be multiplexed to numerous simultaneous destinations.

One more quirk we should mention - the Chroma pitch wheels operated backwards from most, that is, pushing up lowered pitch, and pulling it back

raised pitch, so any of the original patches will work this way. If you'd like to modify a patch to be standard "wheel-forward-moves-pitch-up," here's how:



In the PITCH section, locate the mod bus that pitch bend is currently assigned to and invert the *MOD DEPTH* setting. In the example above, you'd set *MOD DEPTH* to *+3* instead of *-3*.

Keep in mind you'll most likely need to do this for all layers - A and B if you're just using Chroma, or A, B, C, and D if you're using a double Chroma+Expander patch. (You can streamline the process a bit by clicking the *EDIT A+B* or *EDIT C+D* in the EDIT MODE section.)

MOD- Like the PITCH paddle, the MOD paddle is a mod source in most of Chroma's mod source menus. Unlike most mod wheels though, it's a spring-loaded and self-centering like the pitch wheel. When used with a hardware MIDI/USB controller with a standard bottom-to-top (i.e. not centered) mod wheel control, it moves onscreen from middle-to-top position. This results in positive-only mod values, just like a standard mod wheel. That said, it can output negative values either by moving the control with onscreen with the mouse/trackpad, or by assigning a different hardware MIDI controller (by right-clicking, selecting *MIDI Learn*, and moving the desired controller).

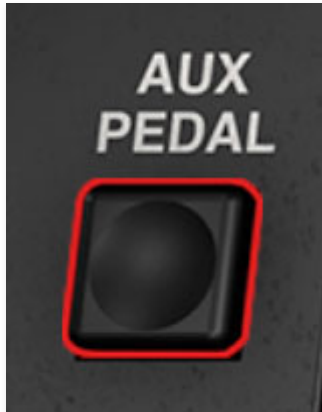
To configure mod wheel-controlled vibrato or tremolo, check out *Using Amplitude Mod to Set Up Mod-Wheel Controlled Vibrato, Tremolo, etc.* toward the bottom of the page in the **Sweep** section.

1/2- Unlike the pitch and mod sliders, these are not "spring loaded" and will remain at whatever position they're set to. *1* and *2* paddle positions are stored with saved patches.

Aux Pedal button- The original Chroma included a fanciful piano-style dual-pedal foot controller (they're probably \$27,000 on Reverb these days). The right-side pedal was a standard sustain pedal; the left-side pedal was referred to as the *Auxiliary Pedal*, and it has its own dedicated mode button in the CONTROL section. It's an on/off pedal that performs a couple of nifty

real-time functions. In the name of staying true to the original Chroma's functionality, we wanted to retain it .

The problem we ran into is that many MIDI/USB controllers don't have additional pedal input jacks (the fancier Arturia and Native Instruments controllers do). The other problem is that the MIDI controller # for secondary pedals isn't standardized, so we couldn't set aux pedal to a fixed MIDI controller # the way we normally would with a pitch bend or mod controller.



The solution was to add a corresponding *AUX PEDAL* momentary button in the left-hand controls section. This lets you assign *any* hardware MIDI controller to the button - an actual pedal, or a button on a MIDI/USB controller, and it's easy to do thanks to Cherry Audio's super simple right-click MIDI assign function (right-click the *AUX PEDAL* button, select *MIDI Learn* from the menu, whack the button/pedal/MIDI yogurt maker/etc., controller is assigned).

We've replicated the Aux Pedal's functions, which are as follows:

- **Latch Pedal**- Allows specific keyboard notes to be held while playing other non-held notes to be concurrently played.
- **Note Gate**- Disables or enables the entire layer using the pedal. This is used with dual-layer patches to bring in or mute one of the layers.
- **Poly Chord Buffer**- This lets you "enter" a chord, then trigger it using the left pedal.

For more info about the preceding *Latch Pedal*, *Note Gate*, and *Poly Chord Buffer* functions, please see the **Parameter Program/Control/Aux Pedal Mode** section.

- **Glide Enable/Disable**- The Aux Pedal acts as a momentary control when *Aux Pedal Enables Glide* is checked in the *GLIDE SHAPE* menu. For more info, please see the **Left-Hand Controls/Aux Pedal Button** section.

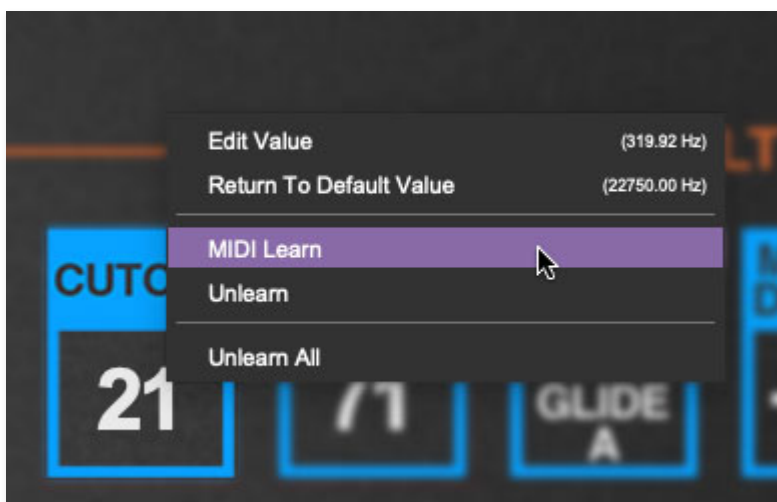


Assigning internal and external hardware controls adds a whole new dimension of control and musicality to patches, and it's really easy to do. The MIDI Tab is where all controller assignments can be viewed and tweaked. First we'll show how to assign an external hardware controller to a Chroma control, then we'll go over all parameters in the MIDI Tab.

Basic External Hardware Control Assignment

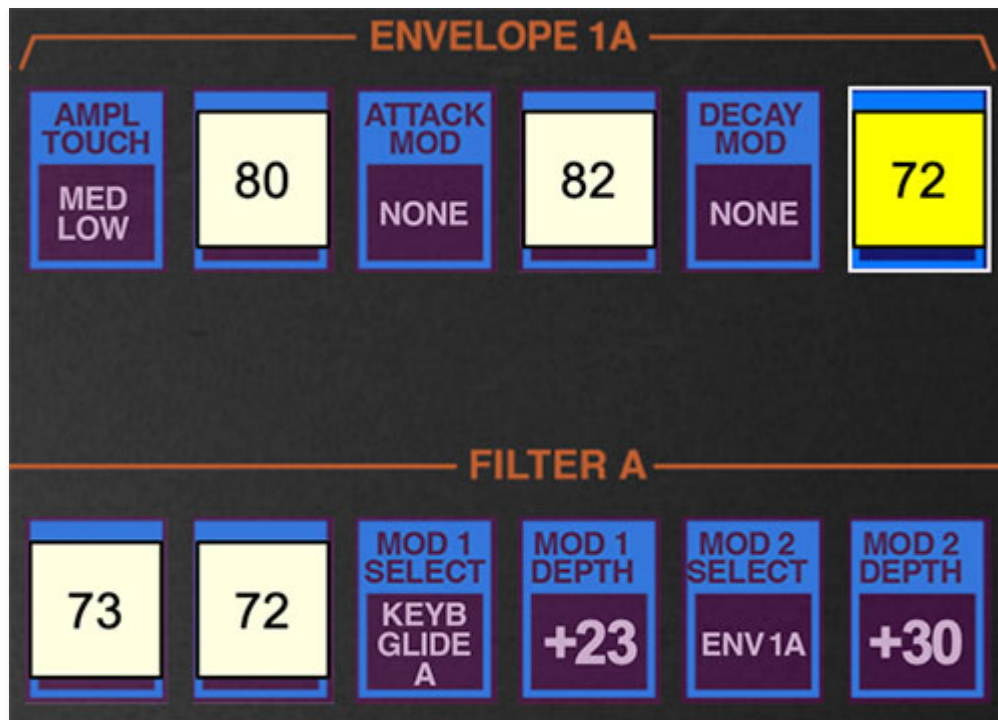
This is the quick, "I just want to assign a hardware control right now!," section. We recommend reading this entire section to best take advantage of Chroma's MIDI control assignments.

In this example, we'll assign a hardware slider control to FILTER section *CUTOFF* control.



Begin by right-clicking anywhere on the *CUTOFF* control in the *FILTER* section and selecting *MIDI Learn*. A transparent purple overlay appears over the control indicating that it's in learn mode. Now move the desired hardware control device. The purple overlay disappears and the hardware control will move the onscreen control. If you change your mind (or accidentally select the wrong control), learn mode can be cancelled by right-clicking and selecting *Stop Learning*.

This is the basic procedure for assigning hardware controllers to any Chroma control.



Once a MIDI controller has been assigned, in addition to real-time control of a Chroma parameter, you'll also be able to record and play back controller data from a DAW.

The MIDI Tab

This is command central for all MIDI controller assignments. Here you'll be able to see information about all currently assigned controllers and adjust control ranges.



To view or hide the MIDI Tab, click the *MIDI* button in the top toolbar.



MIDI Learn button- This is almost exactly the same as enabling MIDI learn mode by right-clicking a control. Click the *MIDI Learn* button to enter learn mode (all controls turn purple). Unlike right-clicking on specific controls, where Chroma automatically exits controller assignment mode, clicking the *MIDI Learn* knob "stays on" to enable assignment of multiple hardware controls. This is handy for quickly assigning a bunch of hardware knobs, sliders, or the buttons of a grid-style controller.

When in MIDI learn mode, any previously assigned controller numbers will show in squares. These indicate the MIDI continuous controller number of the assigned hardware control (these are also displayed in the *MIDI* library tab at left).

To assign multiple controls, click *MIDI Learn*, click an on-screen control, move the desired hardware knob or slider, continue clicking and assigning on-screen controllers until all desired controls are assigned, then click *Stop Learning* to exit learn mode.

Remember that a single hardware knob/slider/button isn't limited to controlling just one parameter - a single hardware controller can simultaneously operate as many controls as you'd like. Combined with the MIDI Tab's controller range and inversion controls explained below, this can be a very powerful and customizable way to control parameters.

New Mapping Type- This popup menu selects whether newly assigned MIDI mappings will be global (affects all sounds and doesn't change when different presets are selected) or saved with individual presets.

MIDI Tab Columns

Name- Displays the name of the parameter being controlled.

Type- There are five possible types of Chroma controller automation:

- **Note**- Notes played on a MIDI keyboard controller, expressed as C-1 to G9
- **CC (MIDI Continuous Controller)**- The standard 128 MIDI controller numbers as defined in the MIDI spec. More specifically, these are the controllers transmitted by hardware knob and slider controls. MIDI CC's can be used to control parameters in real-time or recorded and played back within DAW software.
- **MMC (MIDI Machine Control)**- The MIDI control protocol for tape machine-style transport controls. Back in the dark ages, this was used to control wonky old Tascam and Fostex reel-to-reel monsters, but it's useful if your MIDI controller has tape-style transport control buttons.
- **Pressure**- Most modern keyboard controllers transmit controller data when keys are pressed and released as they're held down. The vast majority of keyboard controllers with aftertouch transmit "mono" aftertouch only; in other words, aftertouch data is the sum of all keys to one single data stream.
- **Key**- This allows keys of the computer QWERTY keyboard to act as button controls for Chroma's onscreen controls.

Value- Displays the specific automation controller. In the case of a *Note* this would show a MIDI note number (C-1 to G9, for a MIDI CC, this would be the

MIDI CC controller number, etc. Clicking on the value opens a pop-up menu where all values are displayed and can be selected.

Preset- This slider works in conjunction with the *New Mapping Type* popup control. In the left position (gray background), the MIDI mapping is global (affects all sounds and doesn't change when different presets are selected), in the right position (lavender background), the MIDI mapping is saved with, and only affects the current sound preset.

The *Preset* switch is super nifty, because it means that MIDI mappings can easily be changed to global or per-preset status at any time.

Min- Sets a limit on the lowest value any automation control can set a mapped controller to. This actually recalibrates the range of the automation controller to the remaining parameter range.

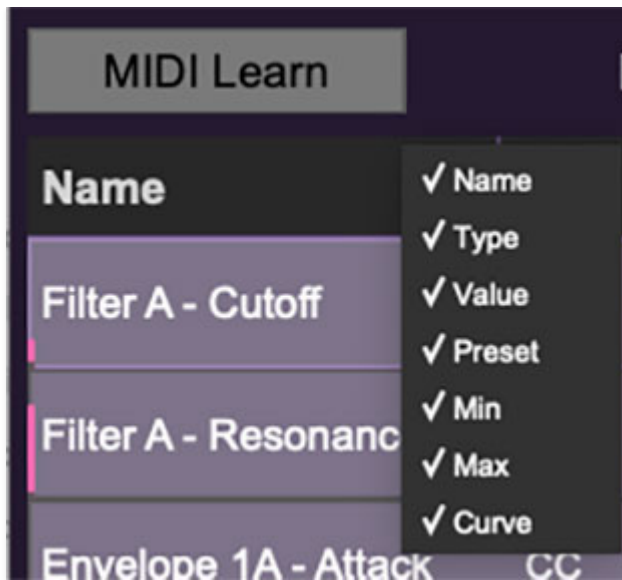
Max- Sets a limit on the highest value any automation control can set a mapped controller to. This actually recalibrates the range of the automation controller to the remaining parameter range.

Curve- These allow the customization of how incoming MIDI CC controls affect the movement of Chroma's onscreen controls, ranging from exponential to linear to logarithmic curves.

Super Cool Min-Max Tricks- Not only can parameter ranges be limited via the *Min* and *Max* knobs, mapped control destinations can be completely inverted by setting the *Min* knob all the way up and the *Max* knob all the way down (or anywhere in between).

Limiting and inverting parameter ranges with the *Min/Max* controls is particularly useful when multiplexing a single hardware control to operate multiple parameters. Because *Min/Max*, range inversion and *Curve* settings can be separately set for each onscreen control, the customization options are super flexible.

MIDI Tab Column Configuration Right-Click Menu



Right-clicking anywhere in the top row (*Name*, *Type*, *Value*, etc.) displays the column configuration menu. Checking/unchecking these allows hiding and display of each column. This has no effect on assignments.

MIDI Tab Parameters Right-Click

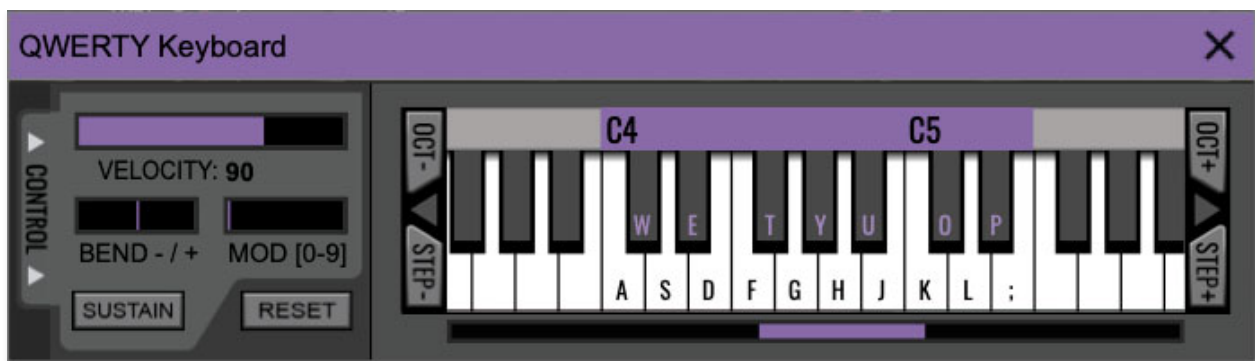


Right-clicking on an assigned parameter opens the menu above.

MIDI Learn- This is used to change the controller assigned to a particular parameter.

Unlearn- Deletes the selected automation parameter.

Unlearn All- Deletes all controller assignments for the patch. Chroma will display a warning dialog prior to deletion in order to thwart potential unlearn-related disasters.



If you don't have a MIDI keyboard attached to your computer, the onscreen keyboard can be used to play notes, but clicking on pictures of keys gets old pretty quick, and it's impossible to play chords that way (unless you know something we don't).

The better solution playing Chroma in lieu of a standard MIDI/USB keyboard controller is what we call the QWERTY Musical Typing Keyboard, or "MTK" for short. This allows your computer's keyboard to be used as a polyphonic controller, and also enables a few other tricks.

Following is a list of MTK keyboard modifiers and functions:



Opening and Closing the MTK - click the the circular keyboard icon in the top toolbar. To close the MTK, click the keyboard icon in the top toolbar, or click the X in the top right corner.

Play Notes- To trigger notes, simply press the corresponding computer keyboard key or mouse click the onscreen keys.

Adjust Currently Visible MTK Range- Slide the purple scroll bar horizontally to adjust the currently visible keyboard range.

Adjust Overall Visible Keyboard Range- Clicking and dragging the right edge of the MTK window allows the overall size of the window to be adjusted. This lets you view more or less of the onscreen keyboard. Note that the MTK window's borders cannot exceed the overall outside dimensions of the Eight Voice window.

Shift Range Up/Down Octave- Click the *Oct-* and *Oct+* buttons at the top left and right of the onscreen MTK. The current range is displayed above the keyboard.

Shift Range Up/Down Semitone- Click the *Step-* and *Step+* buttons at the bottom left and right of the onscreen MTK. The current range is displayed above the keyboard.

Hide/View Controllers- Clicking *Control* at the far left hides and displays velocity, bender, mod, and sustain control parameters. Hiding the control view makes more space available for the keyboard.

Set Note Velocity- Move the purple *Velocity* bar to adjust the output velocity of notes.

Pitch Bend- To pitch a note or notes, press the + or - computer keyboard keys while playing a note. Bend Depth will be the sum of all PITCH section pitch bend mod bus settings. Since you'll generally use MOD 3 for pitch bend, just set the *MOD 3 SELECT* menu to *Pitch Bend*, and then use the *MOD 3 DEPTH* control to set the bend depth in half-steps. Notes can also be pitchbent by clicking the mouse in the *Bend* area.

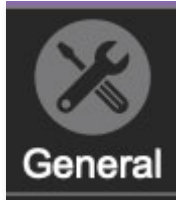
Mod Wheel- To add mod wheel modulation, press the number keys from 0-9 (above the character keys) while playing a note. The modulation amount will vary from none (0) to full modulation (9). Note that modulation will "stick" at the selected number; to disable modulation, click the 0 key. Mod can also be engaged by clicking the mouse in the mod bar area.

Sustain- The *Sustain* button mimics the functionality of a standard sustain pedal. Click the [TAB] key to engage sustain, or [SHIFT]+[TAB] to lock it. The *Sustain* button can also be engaged by mouse clicking it.

Reset- Initializes all MTK parameters including keyboard range and control parameters.

Clicking the settings gear icon opens a window with multiple tabs for configuring various "under-the-hood" settings. These are mostly set-and-forget kind of parameters - all the stuff you'll use most is on the front panel, where it belongs!

General



- **Add Undo For Control Changes With The Mouse**- Enabling this allows undo of knob, switch, and button adjustments. You'll want this on if you want the ability to undo all aspects of patch editing and programming.
- **Create A Log File For Usage**- This creates a text doc of all of Chroma's internal and routines during use. It is mainly intended for our tech staff should you experience any issues. Clicking *Show Log Folder* opens the folder containing Chroma log file docs.
- **Load Last Preset On Startup (Standalone Only)**- Automatically loads the last preset used when Chroma standalone version is started.
- **Preset Folder**- Displays the current location of Chroma's sound presets. This can be changed by clicking and typing in the field.
 - **Browse...** - Displays the current location of preset folder in the file manager.
 - **Set Default**- Sets the current displayed *Preset Folder* path as the default location
- **Clear Cache Files**- Deletes all log files, temporary sounds, and the image cache.



Interface

Allows customization of Chroma's user interface settings.

- **Reset To Default Window Size-** Resets the Chroma workspace to default size. Use this to reset the window size if the window somehow becomes too large for your display and can't be resized.
- **Tooltip Delay-** Tooltips are those informative bits of text that pop up when hovering over a control (go ahead and try it, we'll wait...). The *Tooltip Delay* setting defines how long you must hover before the tooltip pops up.
- **Knob Movement-** Defines how mouse movements relate to turning onscreen knobs. It defaults to *Vertical Drag*, but can be changed to *Horizontal Drag*, or *Rotary Drag*. There is currently no setting for *Imperial Drag*, a sweet 90s alt-rock band featuring ex members of Jellyfish.
- **On Control Double-Click-** Defines what happens when the mouse is double-clicked on a control. If *Edit Value* is selected, an exact number can be entered by typing the number and hitting [ENTER] or [RETURN]. If *Sets Default Value* is selected, double-clicking a control resets it to its default value.
- **Mouse Wheel Adjusts Control Value-** Enabling this lets you adjust knob, slider, and switch values by moving the mouse wheel. This works great with a standard mouse wheel, but you'll want to disable it if you're using an Apple Magic Mouse (which will move the control AND scroll the window).
- **Show Tooltips When Adjusting Controls With Mouse-** Displays parameter tooltips/values when the mouse is hovered over a control or as a control is moved with mouse button down.
- **Show Tooltips When Automating Controls-** Enabling this causes control tooltip flags to show when automation data is being received.
- **MIDI Program Changes Should Change Current Preset-** Allows MIDI program change messages to change Chroma patches.
- **Ask To Save Modified Presets-** This opens a dialog window asking if you'd like to save changes if a patch has been edited and a new patch is selected. If you're the type that likes to click through presets and tweak a control here and there, it can be annoying to have a popup window asking if you'd like to save every time you switch presets - if you're that person, keep this off.

- **Remember MIDI Mappings For New Plug-in Instances**- When enabled, Chroma remembers all global MIDI Tab controller settings.



Account

Settings for your personal login information and account.

- **Email**- Displays the email address of the current login.
- **Update Login Info**- Clicking this opens the same email and password login screen you'll see when initially launching Chroma and allows changes to be made.
- **View Account Settings**- This opens your personal account page on the Cherry Audio Store website containing information about modules purchased and more.

Software Update

- We often fix bugs and make improvements; below are options defining how Chroma handles updates.
- **Check For Update**- Click this to see if an updated version of Chroma is available.

Status:

- **Automatically Install Updates**- Updates are automatically downloaded and installed.
- **Ask Before Installing Updates**- By default, Chroma automatically downloads new versions of modules when available. Checking this box defeats automatic updates and will ask if you'd like to install updates when they become available.

We'll never make changes that can potentially break existing patches, but if you're using Chroma for live performances or in other "mission critical" situations, we recommend enabling *Ask Before Installing Updates*.

- **Never Install Updates**- Chroma never automatically installs updates.
- **Show Updates On Toolbar**- Checking this will display an icon in the toolbar next to the logo letting you know there's an update available.

Show Notifications From Cherry Audio- We occasionally will fire off in-app advertisements; disabling this checkbox will hide them. We hate repetitive, annoying ads as much as you, so we won't use this feature too often. When we do, it'll be for something super cool (like a killer sale)!



Audio/MIDI

Settings for audio and MIDI hardware input and output. **This tab is only visible in the standalone version of Chroma.**

- **Output**- Use this drop-down menu to choose a physical audio output source. This defaults to *Built-In Line Output*, i.e. your computer's onboard system audio, but you'll get better fidelity with an external professional audio interface.
- **Sample Rate**- This sets Chroma's global sample rate. Lower sample rates offer better performance, but if you have a fast computer, high sample rates may offer slightly improved fidelity.
- **Audio Buffer Size**- As with any digital audio app, this defines performance vs. note latency, and will largely depend upon computer CPU speed. A professional external audio interface will almost always exhibit better performance than "built-in" system audio. Lower settings will result in less latency (in the form of faster response to notes played), but will increase the chances of audio gapping or crackling noise.
- **Active MIDI Inputs**- Displays all available MIDI input sources, i.e. keyboards, pad controls, MIDI knob/fader control surfaces, etc. Check boxes to enable one or more devices. If you're using a fader controller with touch-sensitive sliders (Mackie Control, for example) and Chroma plays weirdo notes when you lean on the faders, uncheck it here to make that stop (incidentally, this happens to me all the time and scares the crap out of me).

- **Bluetooth MIDI**- Allows Chroma to receive MIDI from Bluetooth sources when enabled.

As discussed in the PATCH PARAMETERS / CONTROL chapter, the *PATCH CONFIGURATION* button selects the basic synthesis setup of Chroma's A and B voice paths (or C and D for the Expander). There are a total of 16 possible configurations, divided across five categories.

So we don't go nuts typing (and driving you mad with parentheticals like this one), **all examples in this section will refer to voice paths A and B, and it will be understood that these are identical to the C and D voice paths in the Expander.**

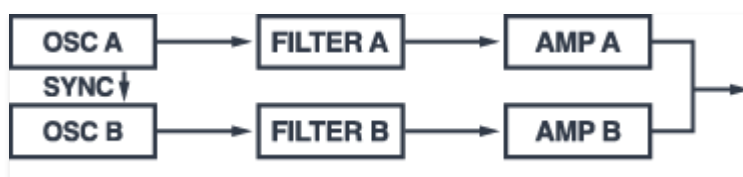
Remember that Patch Configuration can be set not only by clicking its button in the CONTROL section, but also by clicking directly on the Patch Configuration block diagram.



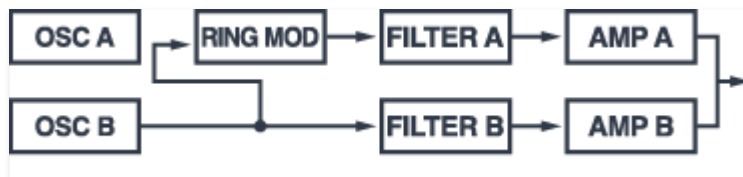
Single Layer- The most basic of the patch configurations, this consists of a single oscillator>filter>amp voice path. The B voice path is disabled, as are all associated controls in the MASTER and EDIT MODE sections. It should go without saying that Single Layer mode should be used for simple sounds.



Dual Layers- The same as Single Layer, but with two independent oscillator>filter>amp voice paths. Dual Layer is useful for standard two-oscillator polysynth patches, such as detuned pads. Because it has independent filters, interesting timbres are possible using individual filter cutoff frequency settings, or setting one filter to lowpass mode and the other to highpass mode.



Dual Layers + Osc Sync- This is the same as Dual Layers, but adds the ability to hard sync the frequency of Oscillator B to Oscillator A. To get familiar "tearing" sync sounds, alter or modulate Oscillator B's frequency controls in the PITCH B section. Reduce the VOICE VOLUME A slider for a more emphasized sync tone.



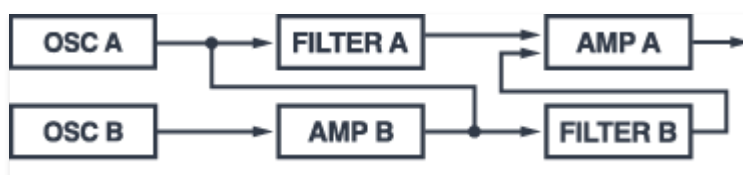
Dual Layers + Ring Modulation- This is like the Dual Layers voice configuration, but with a ring modulator in place of oscillator A. For those not familiar with ring mod, following is a brief recap that I lazily copied from some other Cherry Audio manual:

When two audio sources are inputted, the output contains only the sum and difference frequencies of the two signals, while removing common frequencies. The audio result is useful for creating sounds with inharmonic frequency content, which is useful for synthesizing bell and metallic sounds.

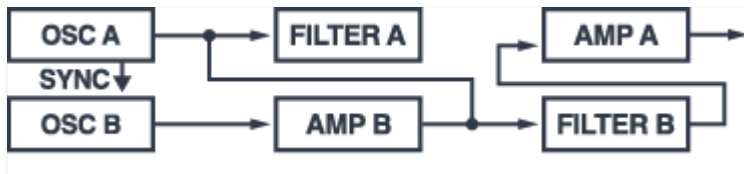
Ring mod is heard through the A channel; we recommend manipulating (and modulating) PITCH A and B controls. **Also be aware that ring mod makes use of oscillator pulse waves only regardless of the current WAVE SHAPE setting, so make sure WAVE SHAPE WIDTH is at a setting other than minimum or maximum.**



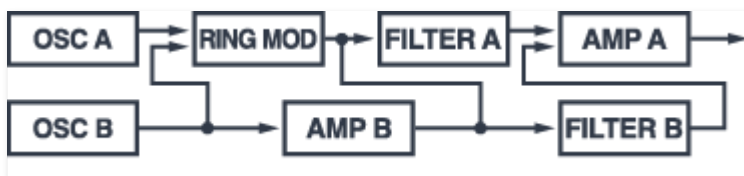
Filter Modulation- The standard Dual Layers voice path, but instead of being used for audio, the B path is used to modulate the A path's cutoff frequency for dramatic audio-rate modulation.



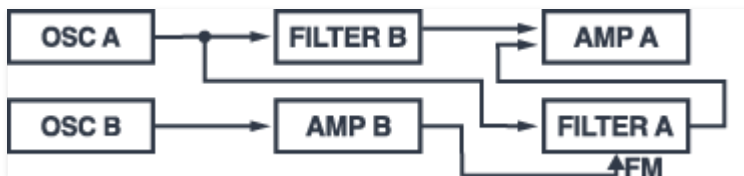
Parallel Filters- This routes both oscillators to both filters in parallel, with oscillator B volume controlled by Amp B, and Amp acting as a master volume for the entire patch. A notch filter can be created by setting of the filters to highpass mode. Phasey effects can be created by manipulating cutoff - this works especially well when EDIT MODE *EDIT A+B* is chosen, effectively moving both cutoff sliders at once.



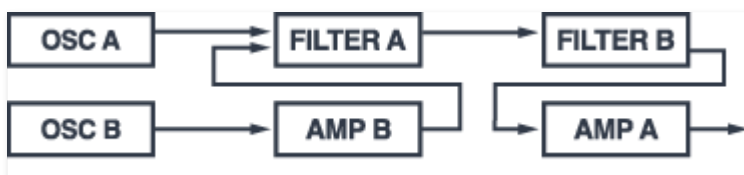
Parallel Filters + Osc Sync- Like the preceding Parallel Filters voice path, but adds sync between the OSC A and B.



Parallel Filters + Ring Mod- Like the Parallel Filters voice path, but replaces Osc A with a ring modulator. This can be used for ring mod effects with notch filtering as described in the Parallel Filters section.

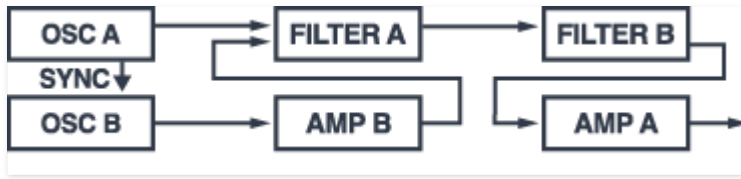


Parallel Filters + Filter FM- Same as the Filter FM voice path, but AMP B's output modulates the cutoff frequency of Filter A.

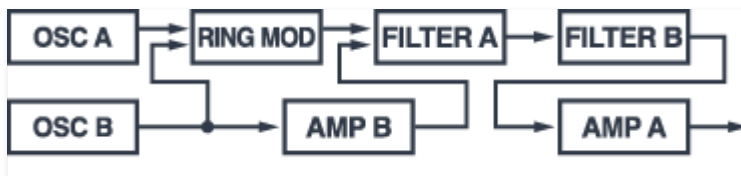


Series Filters- This routes both oscillators to both filters in series with Osc B volume controlled by Amp B, and Amp A acting as a master volume for the

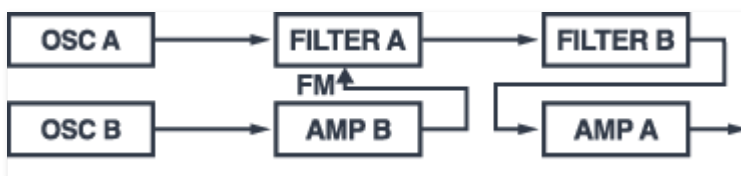
entire patch. Because Chroma's filters are 12dB/oct, this "stacking" creates a steeper 24 dB/oct response.



Series Filters + Osc Sync- Like the preceding Series Filters voice path, but adds sync between the Osc A and B. To mute Osc A (i.e. to better isolate the synced Osc B), set *WAVE SHAPE A* *WAVE SHAPE* to Pulse and *WIDTH* to 0. Use this voice configuration for oscillator sync sounds with a 24 db/oct filter response.



Series Filters + Ring Mod- Like the Series Filters voice path, but replaces Osc A with a ring modulator. To mute Osc B (i.e. to better isolate the ring-modded OscA), set *WAVE SHAPE A* *WAVE SHAPE* to Pulse and *WIDTH* to 0. Use this voice configuration for ring mod sounds with a 24 db/oct filter response.



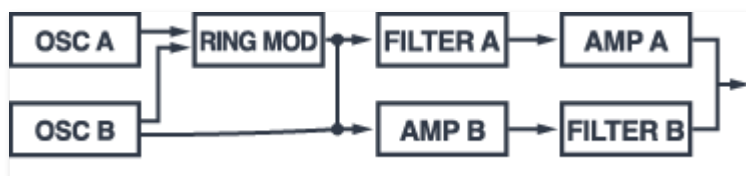
Series Filters + Filter FM- Like the Series Filters voice path, but the output of Amp B modulates Filter A cutoff frequency.



Variable Filters- Osc A and B outputs are mixed, then fed into both filters. Each amp controls levels from each filter, allowing the creation of asymmetrical notches. (Incidentally, I saw Asymmetrical Notches open for The Modern Lovers at The Rat in Boston in '79). This Patch Configuration is useful for creating phase-y/flange-y timbres when one of the filters is set to highpass mode and cutoff is modulated.



Variable Filters + Osc Sync- Same as Variable Filters but Osc B is synced to Osc A. This is useful for notch-filtered sync sounds, and "duo timbre" filter effects with sync.

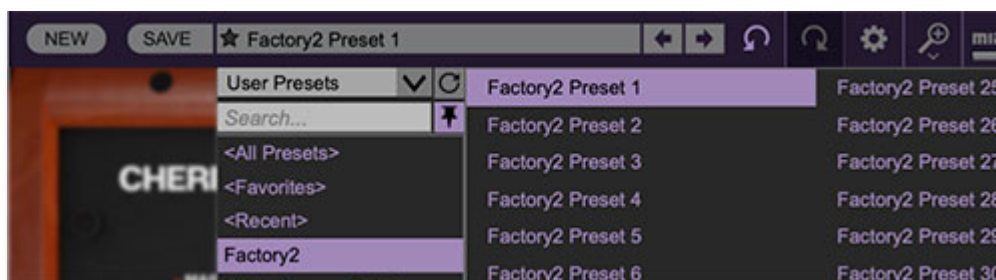
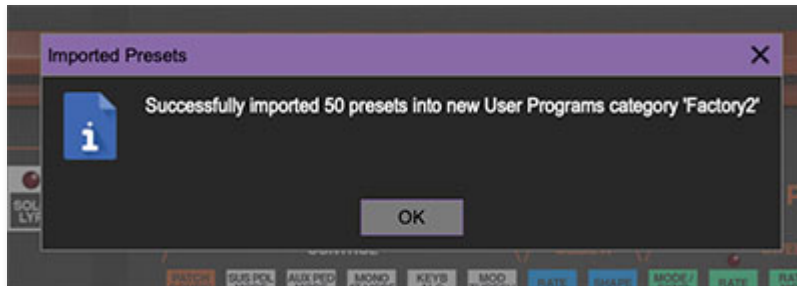


Variable Filters + Ring Mod- Same as Variable Filters but Osc A is replaced with a ring modulator. Useful for atonal/bell tones with notch filtering.

Original Rhodes Chroma patch data in sysex format can easily be imported directly into Cherry Audio Chroma via drag-and-drop. These must be in "Syntech" .syx format. Public domain sound banks can be found online through the usual search engine channels.

IMPORTING SOUND BANKS AND INDIVIDUAL PATCHES USING A COMPUTER

To import an entire 50-patch sound bank, simply drag and drop the bank anywhere over the Chroma's UI.



If the bank is valid, you'll see a confirmation window and new category containing the banks is created in the presets browser.

Importing a single patch essentially works the same way - drag and drop the sysex file anywhere on the Chroma UI, but for single patches, you won't see a confirmation message and no new banks are created. The patch will be live, but you'll need to manually save it with the *SAVE* button at the top left of the preset browser.

EXPORTING SOUND BANKS AND INDIVIDUAL PATCHES FROM A RHODES CHROMA

If you're lucky enough to own a vintage Chroma or Expander with a MIDI retrofit installed, patch banks and individual patches can be transferred to Cherry Audio Chroma via MIDI.

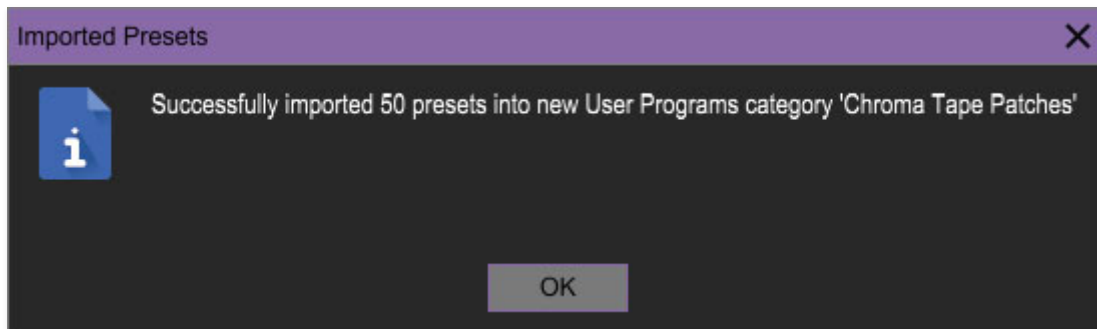
You'll need to refer to your MIDI retrofit documentation for information on initiating MIDI sysex dumps of single patches or banks on the Rhodes Chroma side, but the procedure is essentially that you'll initiate a "Syntech" sysex dump on the Rhodes Chroma and Cherry Audio Chroma will automatically recognize and receive it.

As with dragging and dropping banks on a computer, if an entire bank is sysex sent, Cherry Audio Chroma will display a confirmation message and create a new category in the preset browser. If a single patch is sysex sent, Cherry Audio Chroma won't display a message, but the patch will be live and playable, and you'll want to save it using the *SAVE* button at the top left of the preset browser.

On Chroma and Expander units equipped with the Chroma CPU Plus (CC+) upgrade, single patches can be sent via sysex by pressing SET SPLIT followed by pressing the Preset 20 button. Entire banks can be sent via sysex by pressing SET SPLIT + Preset 36 to enter "CC+ Program Mode," followed by pressing Preset 23 to send the entire bank of 50 presets. Press SET SPLIT + Preset 36 again to exit "CC+ Program Mode."

Cherry Audio Chroma can import 50-program cassette tape data backups made with the original Rhodes Chroma. The recording files need to be uncompressed .wav files, either mono or stereo, and all sample rates and bit depths are acceptable.

To import a 50-program tape data recording, drag the .wav file onto the Chroma's interface. If the import is successful the following window is seen:



If the recorded data is corrupted or incomplete, an error message will be displayed. The good news is that .wav recordings are far less finicky than cassette tapes, so your chances of success are far better than in olden times!