



The Cherry Audio Quadra is a super-accurate and immensely improved emulation of the ARP Quadra synthesizer, originally released in 1978. It's something of a unicorn instrument in that they're rare, not only because ARP didn't produce a lot of them, but also because many have been scrapped over the years as a result of their inherent unreliability. That said, the Quadra has developed something of a cult following because they were frequently used by Genesis keyboardist Tony Banks, and the late jazz legend, Joe Zawinul. And Quadras look super cool, in a here-come-the-neon-80s kind of way. (For the trainspotters, you can also find a Quadra wedged between Mickey Thomas's mustache and acres of leather in Jefferson Starship's impressively corny "Find Your Way Back" video.)

The Quadra was conceived at a time when ARP was on the verge of bankruptcy, largely due to the Avatar, a not-ready-for-prime-time and thus, poorly selling guitar synth. Though ARP made their name on monophonic synths and poly "string" synth instruments, it was clear that polyphonic instruments with instantly recallable patch storage were the way of the future, as illustrated by the wildly successful Sequential Circuits Prophet-5. But instead of putting their noses to the grindstone and developing an

instrument that could go head-to-head with the Prophet-5, ARP took the cheap/easy way out and essentially combined a few existing instruments in one box - the Omni II, a glorified string ensemble, the Solus dual-oscillator monosynth, and a rudimentary bass synth. These were (sort of) controlled by an underpowered 8048 microprocessor. We say “sort of,” because its primary function was to manage the Quadra’s 16 patch storage locations, but the patch storage implementation is so ill-conceived and poorly executed, it’s hard to imagine how it made it out of R&D*. Adding insult to injury, the colorful flat “touch” buttons that were all the rage in the late-70s and early-80s were prone to not working, the chassis tended to flex, and the keyboard jutted out from the front of the instrument a few inches, making it very easy to break keys.

While we’re slugging a synth while it’s already down, another issue: The Prophet-5, and other programmable polys that followed soon thereafter were what’s known as “voice assign” instruments - essentially multiple monophonic synths under the hood, controlled by advanced microprocessors. This allowed each note to have its own independent filter and amplitude envelope curve (imagine a bunch of typical “weoooww” synth notes, each producing their own little “weooooowww” cycle as they’re played). Prior to the advent of the computer-controlled voice-assign instruments of the late 70’s, polyphonic synths and string machines were far more primitive, and would typically have just one filter and envelope generator that affected *all* notes played. This wasn’t too bad for sustained string or organ-type sounds, but the lack of individual note articulation was less than ideal for plucked sounds such as pianos, clavs, or the “weooooow” sweep described above. The Quadra’s Poly Synth and Strings sections both made use of antiquated “paraphonic” organ/string machine technology, thus, no individually articulated notes.

So why would anyone in their right mind want this thing? A couple of reasons... to begin with, ARP had the good sense to incorporate a great-sounding phaser, and the Quadra allowed independent routing of the bass, strings, poly synth, or lead synth sections through it. And although the four synth sections weren't stupendous on their own, the ability to use all four at once (in various split or layered iterations) enabled large and unique tones that would be hard to create on other instruments. Did we mention that Quadras look really cool too?

The Super-Good News

Cherry Audio has seriously addressed all the dumb parts, left the great and unique parts, and wildly expanded the Quadra for an experience that blows away the real thing in every conceivable way. Unlike the original, each section is independently assignable to any region of the keyboard for endless splitting and layering flexibility. The highly limited, one-waveform poly synth's oscillator bank is greatly expanded, retaining the original's "spiky" and "hollow" waves, and adding ramp, and pulse wave with pulse-width modulation, immensely expanding its tonal palette. The odd patch storage has been replaced with Cherry Audio's extensive, unlimited patch browsing system. And not only did we make a killer emulation of the aforementioned onboard phaser effect, we added a stereo chorus/flanger, a syncable echo, and studio-quality reverb, all individually routable for unprecedented effects flexibility. And finally, we've included a multi out version of Quadra that allows individual DAW mixer routing of each of the four sections for individual panning, using third-party effects plug-ins, or routing to separate physical outputs of a multi-output audio interface.

Pre-Purchase Demo Mode



If you haven't purchased the full version of Quadra, it will run in demo mode. All functions will work, but inharmonic tones will occasionally sound (the LED next to *Demo* in the top toolbar will illuminate when the ugly tones are sounding). We've also added a handy button to make purchasing easy, so you've got no excuse! As you might expect, all this demo nonsense disappears once Quadra is purchased.

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=60>

... or you can communicate directly with our ~~clever and irritable~~ outgoing and friendly tech support staff at:

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

*Fun Facts About The Original Quadra Patch Storage

(You don't need to read this, but it's fun.)

If you're a synth historian, or just a nerd like us, here's how the original ARP Quadra "patch storage" system worked (in quotes, because "storage" is a somewhat optimistic description). On a typical vintage-style analog polysynth with patch storage, all movements of knobs or sliders are converted to stepped digital data using an analog-to-digital converter - the resolution is usually high enough that you don't notice the stepping. This is done for two reasons: 1) it allows digital storage of control positions, and 2) it allows a single control to be multiplexed to control the same parameter of multiple voices. For example, when the cutoff knob on a Prophet-5 is rotated, its movement is first converted to digital data, then routed (aka, "multiplexed" or "mux'd") to simultaneously control the filter cutoff of *all five filters at once*.

As you might imagine, all those steps of digital data, multiplied by the number of knobs or sliders on instrument, plus storing the positions of all switches, adds up to a lot of digital data to store (at least in circa-1978 memory). Because ARP cheaped out on silicon, the computer processor in the Quadra simply wasn't up to the task of juggling and storing all of this data, so here's what they did instead:

If you look at a photo of an ARP Quadra, next to the majority of its parameter sliders, you'll notice a small orange dot. This indicates a factory-defined default control position. When a user "patch" is stored in one of the memory slots, the program memory doesn't store the slider position. Instead, it stores whether each slider is in the factory default "dot" position (i.e., bypassing the slider control with a fixed resistor under the hood) or if the current slider position should be used. The user selects between the factory preset control position or the current slider position by clicking the green and blue buttons beneath the sliders - if the LED above the button is illuminated, the slider is in "user" mode, i.e. current position. If the button/LED is deactivated, the control position defaults to the aforementioned fixed "dot" position, selected at the factory to be generically useful for... we don't know.

Thus, a "patch" consists of the current on/off state of the 40 blue and green buttons, about half of which enable or disable the slider above (some of the buttons are just switches that select octaves, waveforms, etc.).

Now imagine how wildly useless this is, and how you might end up with roughly 2 1/2 usable stored sounds in a live situation - and that's *only* if all the sliders are in the correct positions. It hurts my head to think about, and it should make it pretty clear why the every-parameter-fully-storable Prophet-5 handily clobbered the Quadra in the synth marketplace in the late 70s and early 80s.

It should go without saying that we eliminated every bit of this madness in the Cherry Audio Quadra.

Important Takeaway About Original Quadra Patch Storage

(You should read this.)

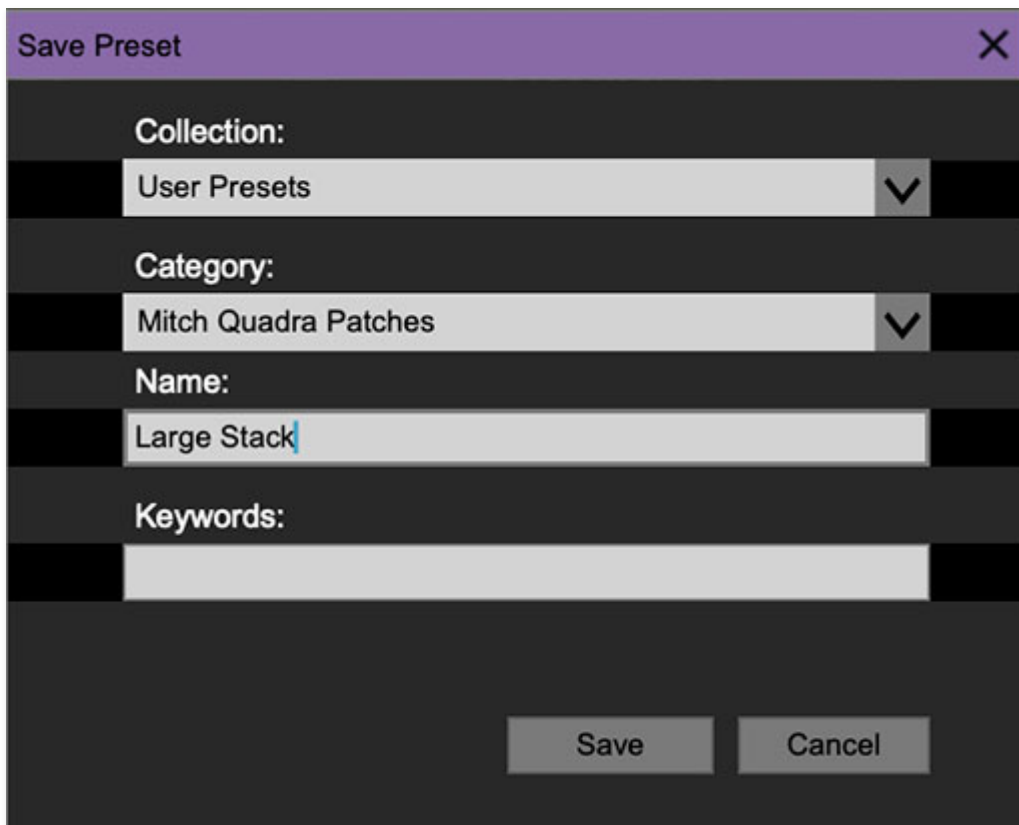
In case you skipped the preceding section, about half of the original Quadra's blue and green buttons work in conjunction with the lame-duck patch storage to enable or disable functionality of the sliders above them. Because the Cherry Audio Quadra has our unlimited, super-great patch browser, it completely does away with the switching-slider-functionality-on-and-off business - all of the blue and green buttons perform standard parameter on/off/toggling duty, making the Quadra much easier to operate, and storing patches is super easy as well. Hooray for modern technology!

Top Toolbar and Preset Browser



The purple strip at the top of the Quadra interface is where you'll load, save, and create sound presets. It also contains utility functions such as undo/redo, UI zoom and *Focus* controls, under-the-hood settings, and more. Let's go over them:

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.

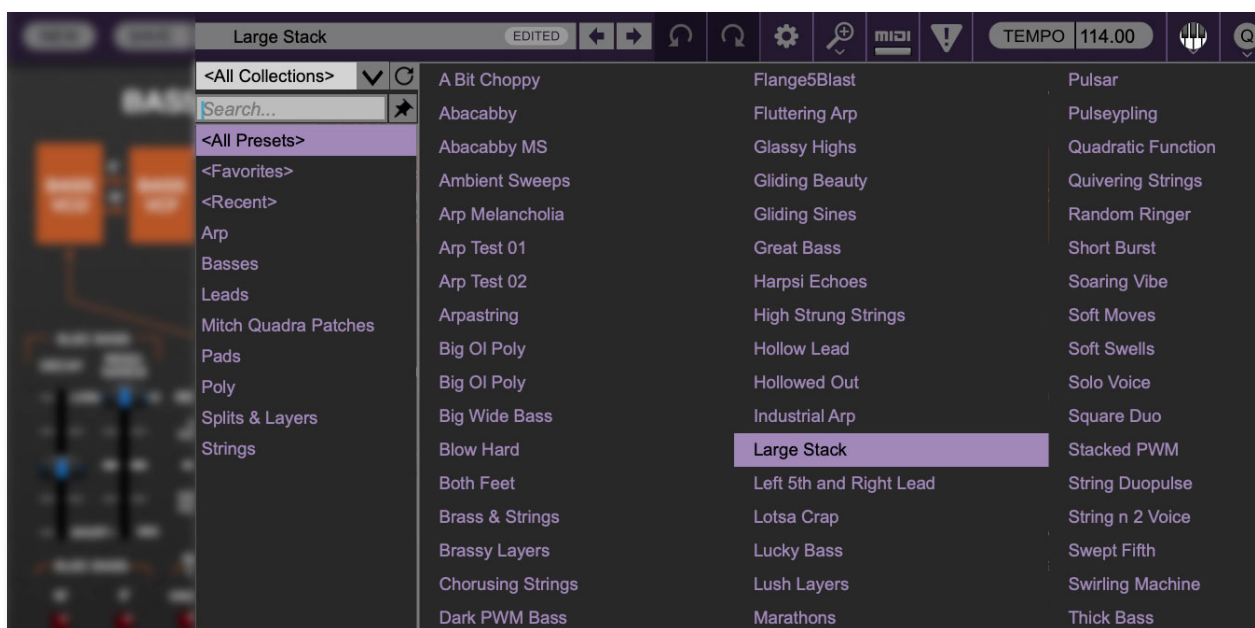


Save- Use this to save patches. There are a couple of levels of hierarchy:

- **Collection**- This is the top level of organization, and contains entire “sets” of presets. The *Quadra Presets* are the main included collection. We also include a *User Presets Collection* for storing your own presets, but you're free to create your own collections. To create a new collections, 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; we like to keep ‘em separated for organizational purposes.

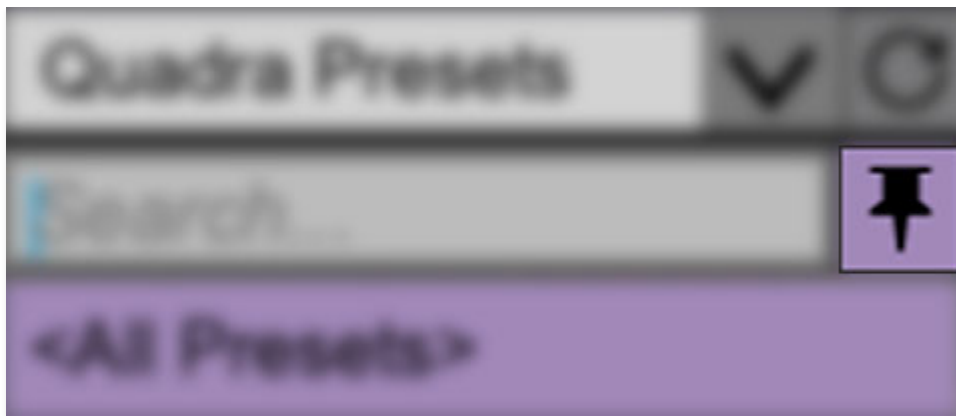
- **Categories**- Within each *Collection* are a number of sound categories. As with collections, you’re free to create as many categories as you like. To create a category, click in the *Category* text field of the *Save* dialog window and type a new category name.
- **Patch**- A patch is an individual sound. To save a patch, simply type the name in the *Name* field and click *Save*.
- **Keywords**- You can add descriptive words such as “stacks,” “noisy,” “stringy,” 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.

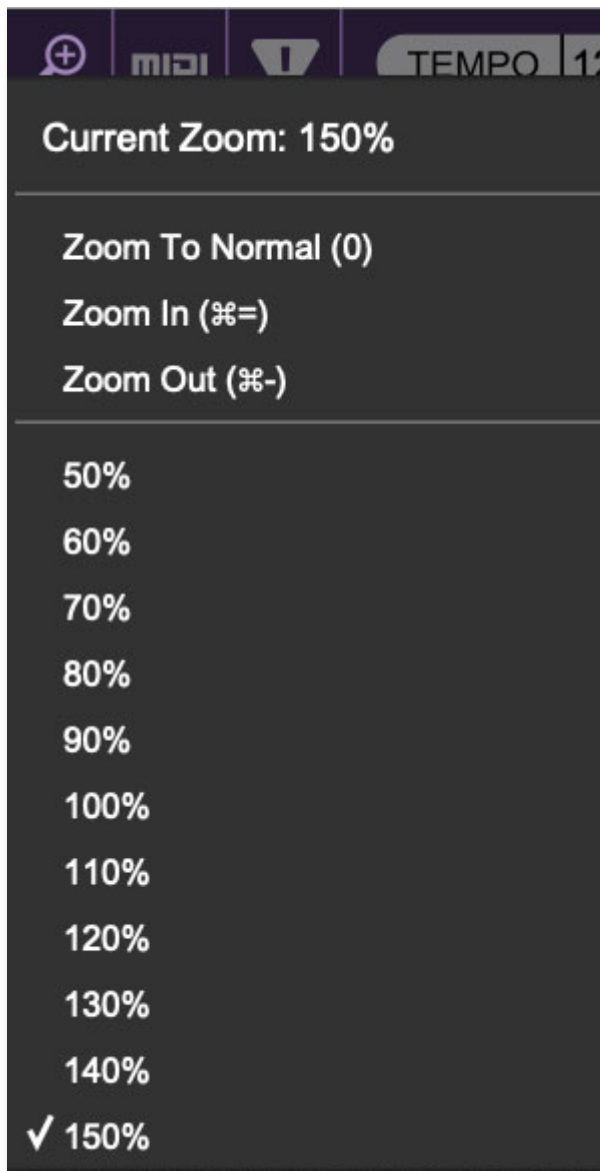


Pin- Clicking the push-pin icon locks the patch selection list open, allowing fast and easy browsing and auditioning of patches. Click the icon again to disable pin mode. when in pin mode, the up and down arrow keys can be used to select patches.

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 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.

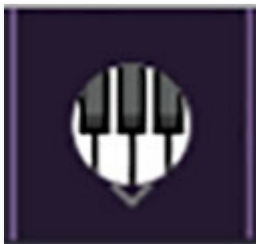
Zoom Magnifying Glass- Click to resize the Quadra interface. Selecting *100%* returns the user interface to native size.

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.

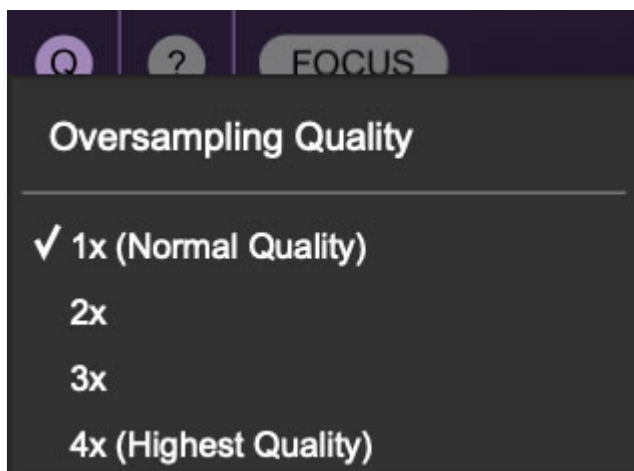
! (MIDI Panic) - Click to send an all-notes-off message in case of, "why won't this thing stop making noise?!?" stuck-note incidents.

Tempo (Standalone Version Only)- Displays Quadra's current internal tempo setting. Quadra's internal tempo affects the *LFO*, *Echo*, and *Arpeggiator* sections when their corresponding *Sync* switches are enabled. 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 Quadra. 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 **QWERTY Musical Typing Keyboard (MTK)** section.

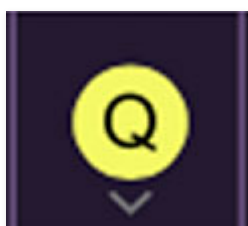


Oversampling Quality (Q)- The Q button sets Quadra's internal oversampling rate; the higher the setting, the better audio fidelity will be, with the caveat that more computer processing power will be required.

Internal processing can be set to *1x* (same rate as the current sample rate of the host DAW or in the *Settings>Audio/MIDI* window for the standalone version) or to *2x*, *3x*, or *4x* the current sample rate. The sample rate is downsampled at the instrument output stage to match the current host sample rate.

For example, if the current DAW/instrument sample rate setting is 48 kHz, and oversampling is set to *2x*, Quadra's internal processing runs at 96 kHz, and is then reduced back to 48kHz at the output stage.

If the current DAW/instrument sample rate setting is 192 kHz and oversampling is set to *4x*, Quadra's internal processing will run at 768 kHz, and you will very briefly hear the most ameeeeezing synthesizer sound quality ever experienced by mankind before your computer instantaneously explodes in a fiery, white-hot supernova blaze. Ok, maybe not.



When oversampling is set to any multiple greater than *1x*, the Q button glows yellow.

Dependent on a number of factors (audio system D/A converter quality, monitor speakers, the nature of the current Quadra patch, etc.), you may not hear a big difference with higher settings. Generally speaking, audible

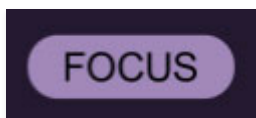
differences may be noticeable when using sounds with a great deal of high harmonics.



Help- Clicking this launches your web browser and opens the help document you're currently reading, which is a really meta concept.

Cherry Quadra logo (lower-right corner)- Clicking this displays "about" information, and shows the version number and current registered user ID.

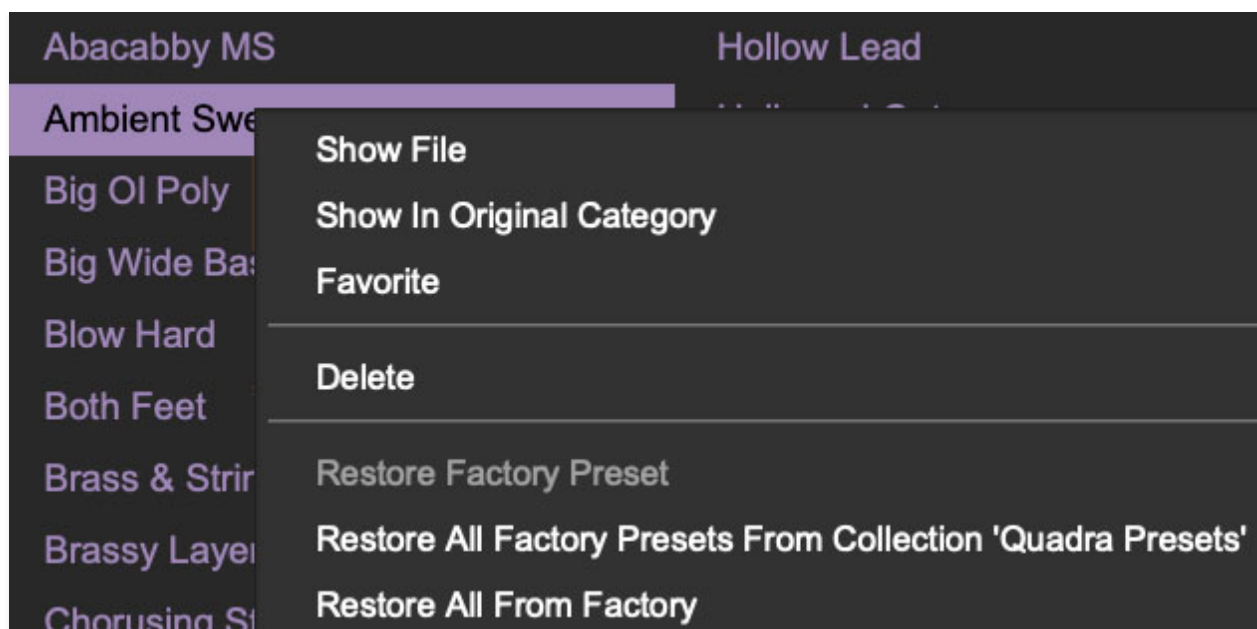
Focus Button



If you're using a tiny laptop, the user interface can potentially be hard to see. With this in mind, the *Focus* button conveniently blows up Quadra's view 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 Angel Cities email account, umkay?)

Using *Focus* mode couldn't be easier - just click the *Focus* button the top menu bar. To return to standard view, click *Reset*. **There's also a superfast key shortcut** - on Mac, hold the ⌘ [COMMAND] key and click the mouse; in Windows, hold the [OPTION] key and click the mouse. Focus can be reset with the same key shortcuts.

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. (Or say something nasty about its mother.)

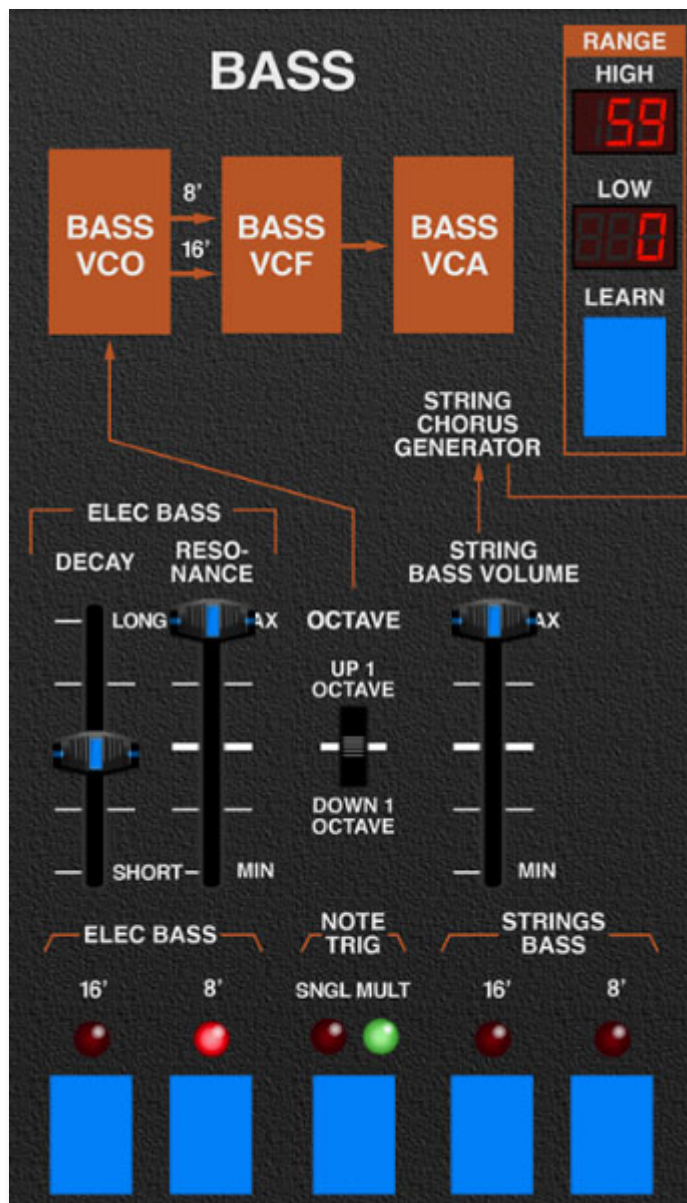
Delete- Deletes the selected preset.

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.

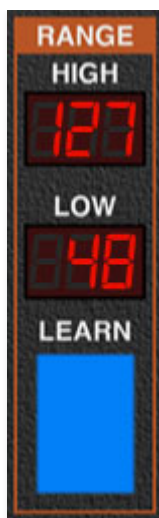
Restore All Factory Presets From 'Quadra Presets'- If any patches from the "factory" Quadra bank are edited and saved, selecting this command restores *all* of them to their unaltered "factory" setting.

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 Quadra bank mentioned above is the only factory bank, so this function and the *Restore All Factory Presets From 'Quadra Presets'* above have the same effect.

Bass Section



The Bass section consists of a one-oscillator, monophonic synth, that is, it can play one note at a time. **It is always low-note priority**, which generally works well, because you're typically holding down the bass note with your left-hand pinky.



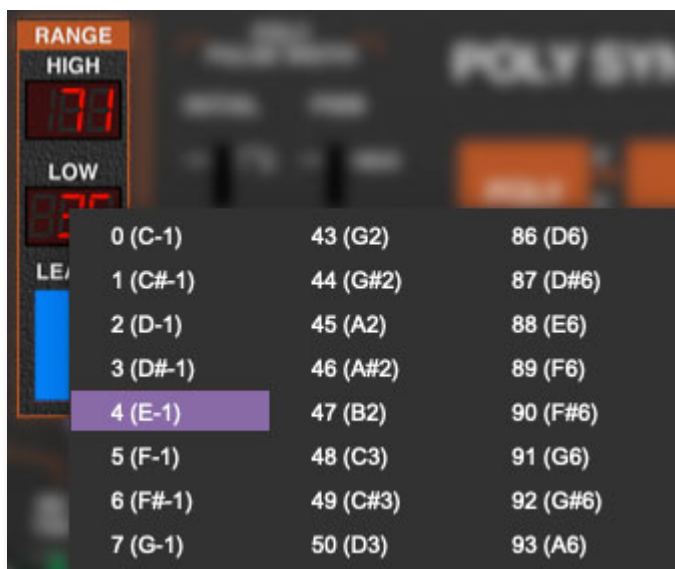
Range

On the original instrument, the Bass section range was fixed to play in the lowest two octaves only, but Quadra allows it to play in any keyboard region depending on the current *Range* settings.

Key Range specifies the MIDI note range the bass section will respond to. When combined with the Strings, Poly Synthesizer, and Lead Synthesizer sections, the split and layer options are endless.

Learn button and Low/High displays- There are two ways to set the keyboard range. The quickest way is via the *Learn* button:

Click the *Learn* button; the number in the *Low* display flashes. Hit the lowest keyboard note you'd like the voice to respond to. The number in the *High* display will now flash; hit the highest note you'd like the voice to respond to. The key range is now set and learn mode is disabled. If you make a mistake, simply repeat the process.



Key range can also be set by clicking on the *Low* or *High* LED numeral displays and selecting the desired note number.

When in the flashing learn mode, the high note can also be selected by clicking the *High* LED numeral display and selecting a MIDI note number; once a note is selected, Quadra will exit learn mode. This can be useful if you'd like to set a top note that's higher than your MIDI controller's highest note.

Elec Bass / Decay- Sets the envelope decay time for the Elec Bass sound. Attack is always instantaneous.

Elec Bass / Resonance- Sets the amount of filter resonance for the Elec Bass sound.

Octave- This slide switch transposes the Elec Bass and Strings bass waves up or down an octave from nominal pitch.

String Bass Volume- Sets the level of the Strings Bass wave routed to the Strings section. Remember that **the Strings Bass wave is not routed to the Output Mixer Bass slider** - it goes “through” the Strings section, and gets controlled by the Output Mixer *Strings* slider (indicated by the horizontal arrow over to the Strings section). In this way, the always-on-under-the-hood strings String Chorus Generator gets applied to the *Strings Bass* waveform for string-machine goodness.

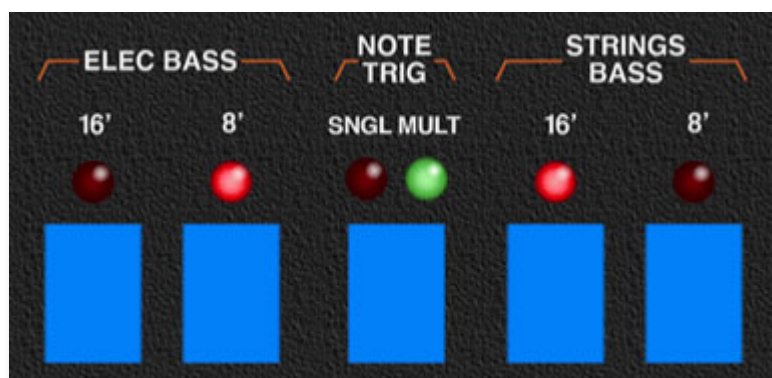
(The *String Chorus Generator* we're referring to is separate from the Chorus/Flanger effect in the bottom row. More about it in the **Strings** section.)

The Strings Bass wave is unaffected by the Bass section *Decay* and *Resonance* sliders. However, it *is* affected by the Strings section EQ, *Attack*,

and *Release* sliders. We know this is a little funky, but that's how the original Quadra works - the idea was that you'd the *Elec Bass* for rock/jazz/etc., or the *Strings Bass* for orchestral bowed string section-type sounds.

This is also goes for routing to the effects in bottom row - use the effects' inputs *Strings* buttons to route the *Strings Bass* wave to effects.

Buttons



Elec Bass range buttons- These buttons select the current octave range for the bass sawtooth wave, displayed in standard organ footages. One or both footage settings may be active at any time.

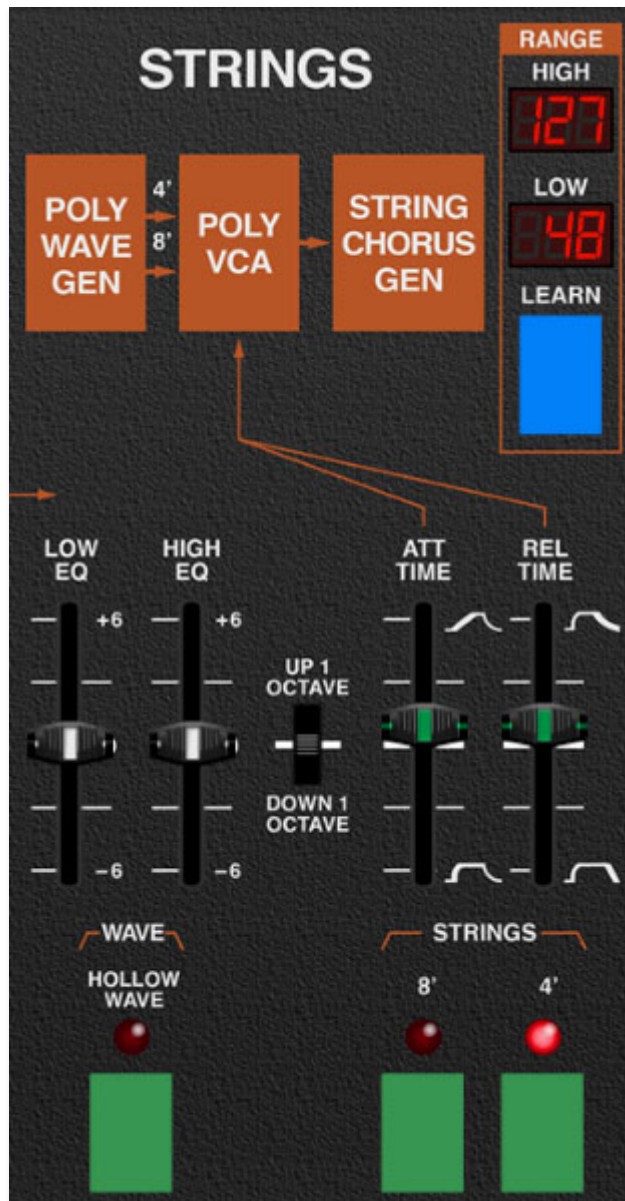
Note Trig / Single/Multi- Because the Bass section can only play a single note at a time, *Note Trig* affects how the envelope generator responds if a note is currently playing and a second note is played.

- *Single-* If a note is currently playing and an additional note is played, any new notes played do not restart the envelope.
- *Multiple-* If a note is currently playing and an additional note is played, any new notes played reset the envelope to the beginning.

In case you a skip-a-doodled the intro of this section, the Bass synth is low-note priority, that is, if multiple notes are played, the lowest one is always heard.

Strings Bass range buttons- These buttons select the current octave range for the Strings Bass wave, displayed in standard organ footages. One or both footage settings may be active at any time.

Strings Section



The Strings section emulates a classic, “top-octave divide” string synthesizer. Top-octave divide synthesis entails one square-wave oscillator running at a very high frequency. IC chips then mathematically divide its frequency to create all necessary pitches. This type of circuit was used in almost all transistor-based organs and string synths of the 60s and 70s. Electronically speaking, this is an easy way to create many notes of polyphony, but it lacks the flexibility of conventional synthesizer oscillators.

Since square waves don't sound very string-like, waveshaping circuitry is employed for each key to transform the waveform into a spiky-wave that sounds a little more string-like. From there, it goes to the always-on String Chorus Generator. This is also known as a “tri-chorus” - a clever and really

great-sounding style of chorus seen in a number of 70s strings machines that used three BBD delay chips with six modulation sources to create that lovely, syrupy string chorus sound made famous by the Solina String Synthesizer (and later, the ARP String Ensemble, whence they made the technological breakthrough of licensing the Solina and whacking an ARP sticker on it).

Important thing: The Strings Chorus Generator has no external controls and is always "on" the Strings section (as well as the Strings Bass in the Bass section). It's totally independent of the Chorus/Flanger in the bottom-row effects section, and if the *Strings* button in the Chorus/Flanger section is enabled, you'll potentially get "double chorus." You have our blessing to do this, in case you're a big Cure fan.



Range

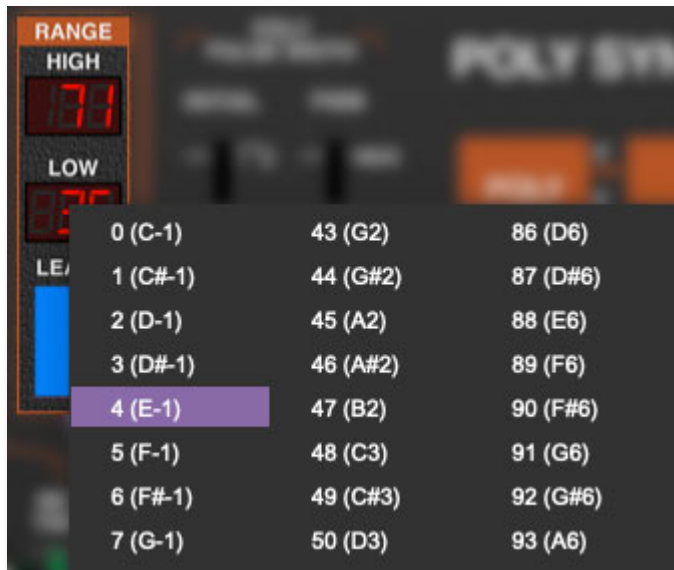
On the original instrument, the Strings section was playable only in the top four octaves, but the Quadra Strings section is playable in any keyboard region depending on the current Range settings.

Key Range specifies the MIDI note range the Strings section will respond to. When combined with the Bass, Poly Synthesizer, and Lead Synthesizer sections, the split and layer options are endless.

Learn button and Low/High displays- There are two ways to set the keyboard range. The quickest way is via the *Learn* button:

Click the *Learn* button; the number in the *Low* display flashes. Hit the lowest keyboard note you'd like the voice to respond to. The number in the *High* display will now flash; hit the highest note you'd like the voice to respond to.

The key range is now set and learn mode is disabled. If you make a mistake, simply repeat the process.



Key range can also be set by clicking on the *Low* or *High* LED numeral displays and selecting the desired note number.

When in the flashing learn mode, the high note can also be selected by clicking the *High* LED numeral display and selecting a MIDI note number; once a note is selected, Quadra will exit learn mode. This can be useful if you'd like to set a top note that's higher than your MIDI controller's highest note.

Low/High EQ- These are gentle low- and high-shelf EQ controls, respectively. They're useful for thinning out or brightening up string patches.

Attack Time / Release Time- The Strings section envelope generator is an "AR," or attack/release envelope. The *Attack Time* slider defines the length of time to reach maximum amplitude; the *Release Time* slider defines the length of time until amplitude falls to zero following key release. Notes will sustain at full volume as long as keys are held.

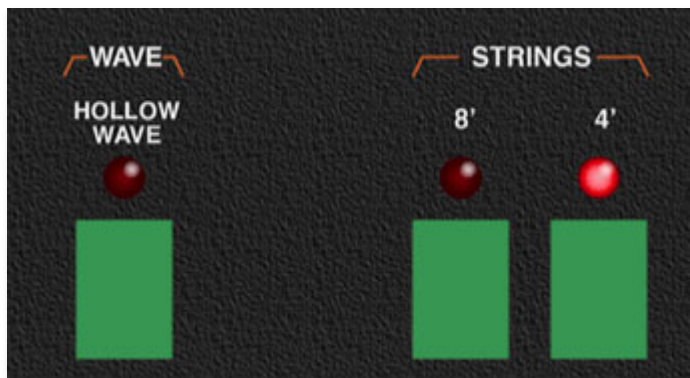
Back in the days string synths, manufacturers approached the thorny issue of full polyphony without separate envelopes for each note in a number of ways. The Quadra is unique in that it has a single attack phase applied to all Strings section notes, but it has independent release phases for all individual notes.

For example, if the *Attack Time* is set to a slow rise time, and a single note is played, its amplitude will slowly increase. If an additional note is playing while the first note's volume is rising, the volume of the second note will

follow the first. If an additional note is played while an earlier note is held at full volume, new notes will immediately be heard at max volume.

However, if notes are released, each one will "correctly" fade out according to the *Release Time* slider setting. **If all notes are released but still fading out and a new note is hit, any notes still fading are abruptly cut off and the newly struck notes' attack phase begins. This is intentional and exactly how the original Quadra's Strings section envelope works.**

Buttons

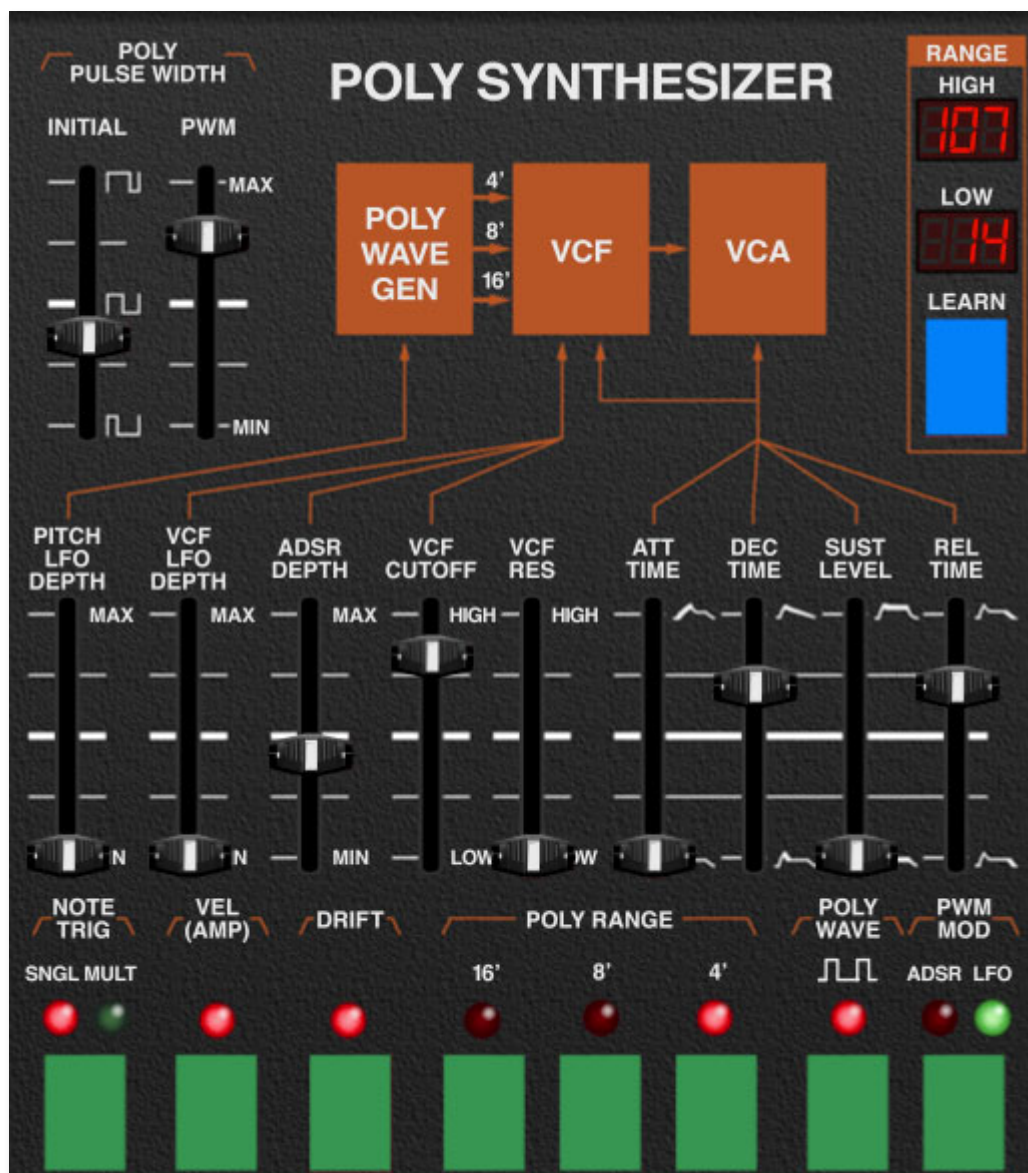


Wave / Hollow Wave- Changes the "spiky" waveform to a more square wave-like sound. It's not really a square wave though; it's unique to the Quadra, and we emulated it super closely.

On the original ARP Quadra, the Hollow Wave button affects the Strings and Poly Synthesizer section waveforms. We've eliminated this; the standard "spiky" wave and hollow waves are both available in Poly Synthesizer, independent of the Strings section.

Strings range buttons- These buttons select the current octave range, displayed in standard organ footages. Either or both of the 8' and 4' settings may be active at any time.

Poly Synthesizer Section



Though the original Quadra Poly Synthesizer section features its own filter and envelope sections, it actually uses the Strings section's top-octave divide tone generation circuitry. This isn't immediately obvious, because the Poly Synth section lacks the great-sounding, always-on String Chorus Generator effect. Specifically, the Poly section "Poly Wave Generator" outputted the non-chorused, string section "spike" or "hollow" waveform only, severely limiting its tonal options. It's one of the original Quadra's biggest shortcomings, so we seriously improved it by adding ramp, sine, triangle, and a pulse wave with manual variable pulse width, or pulse-width modulation, with mod controlled via the Poly Synthesizer envelope generator or LFO. Take our word, it's much better-er!



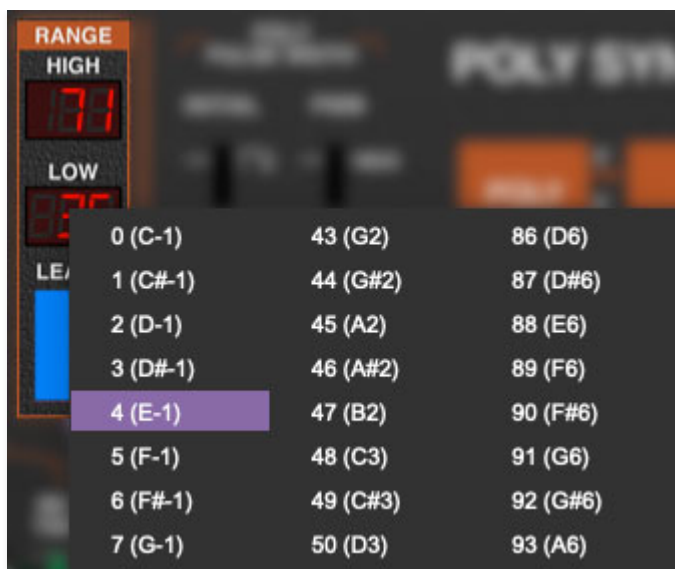
Range

On the original instrument, the Poly Synthesizer section was playable across the entire keyboard, but if you turned on the Bass section, it could only be played in the top three octaves. The Cherry Audio Quadra Poly Synthesizer section is playable in any keyboard region selected with the Range settings.

Key Range specifies the MIDI note range the Poly Synthesizer section will respond to. When combined with the Bass, Poly Synthesizer, and Lead Synthesizer sections, the split and layer options are endless.

Learn button and Low/High displays- There are two ways to set the keyboard range. The quickest way is via the *Learn* button:

Click the *Learn* button; the number in the *Low* display flashes. Hit the lowest keyboard note you'd like the voice to respond to. The number in the *High* display will now flash; hit the highest note you'd like the voice to respond to. The key range is now set and learn mode is disabled. If you make a mistake, simply repeat the process.



Key range can also be set by clicking on the *Low* or *High* LED numeral displays and selecting the desired note number.

When in the flashing learn mode, the high note can also be selected by clicking the *High* LED numeral display and selecting a MIDI note number; once a note is selected, Quadra will exit learn mode. This can be useful if you'd like to set a top note that's higher than your MIDI controller's highest note.

Poly Pulse Width / Initial- Manually sets the width or "duty-cycle" of the pulse wave (the green pulse wave button must be selected to hear it). This control has no effect on the saw wave. This defaults to 50%, i.e., a perfect square wave. Moving the slider up or down from center position narrows its width as well as the thickness of sound until it almost disappears at its extremes.

Poly Pulse Width / PWM- Depending on the setting of the green *PWM Mod* button, Pulse width is modulated either by the Poly Synthesizer ADSR envelope generator or by the global LFO. The *PWM* slider sets modulation depth.

Pitch LFO Depth- Sets the depth of global LFO modulation for the Poly Synthesizer, from zero up to a maximum of three octaves. This is useful for vibrato, sirens, rising/falling pitches, etc., depending on the currently selected LFO waveform. Slider resolution is finer at lower settings to make it easier to set up useful vibrato depths

The original ARP Quadra had no provision for pitch mod for the Strings or Poly Synthesizer section, because they shared the same oscillator bank (thus mod applied to one would have affected the other). Cherry Audio Quadra

uses separate oscillator banks for each; this means LFO pitch mod will *not* affect the Strings section.

VCF LFO Depth- Sets the amount of global LFO filter mod to the Poly Synthesizer VCF.

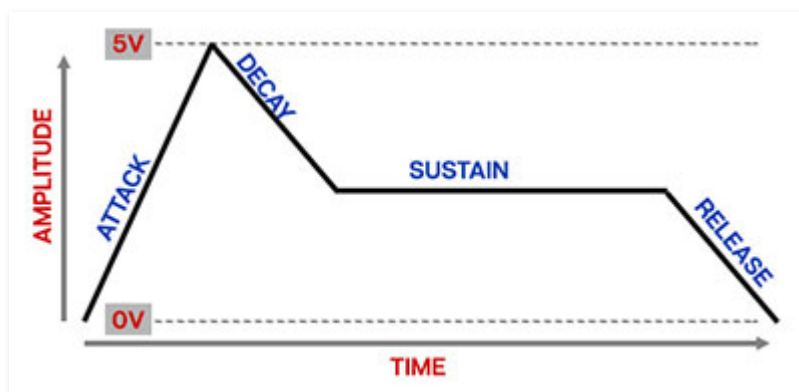
ADSR Depth- Sets the amount of the Poly Synthesizer ADSR envelope generator VCF mod.

VCF Freq- Sets the frequency where attenuation of high-frequency attenuation begins, from 20 Hz up to 24,000 Hz.

VCF Res- Short for “resonance,” this 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 higher settings, you'll hear the familiar analog synthesizer "weeooww" sound.

Poly Synthesizer Envelope Generator

In case you're not familiar with the operation of ADSR envelope generators, here's an exciting and educational ~~speed-bump~~ primer:



When the Poly Synthesizer section sees a gate voltage from a note, the envelope generator outputs a dynamically changing voltage, according to the settings of its four stages. The attack stage defines how long it takes for the amplitude to rise from silence to max volume. Once the attack stage reaches max volume, it moves to the decay phase, which defines how long it takes to fall from max to the level of the Sustain phase. Unlike the attack, decay, and release phases, which define times, sustain simply sets the held volume level following the attack and decay phases as long as the key is held. Finally, the release slider defines the the length of time it takes for the volume to fall back to silence when when the key is released.

Like the Strings section envelopes, the Poly Synthesizer envelope has a single attack phase applied to all notes, but it has independent release phases for all individual notes.

For example, if the *Attack Time* is set to a slow rise time, and a single note is played, its amplitude will slowly increase. If an additional note is playing while the first note's volume is rising, the volume of the second note will follow the first. If an additional note is played while an earlier note is held at full volume, new notes will immediately be heard at max volume.

However, if notes are released, each one will "correctly" fade out according to the *Release Time* slider setting. If all notes are released but still fading out, and a new note is hit, any notes still fading out will be abruptly cut off and the newly struck notes' attack phase begins.

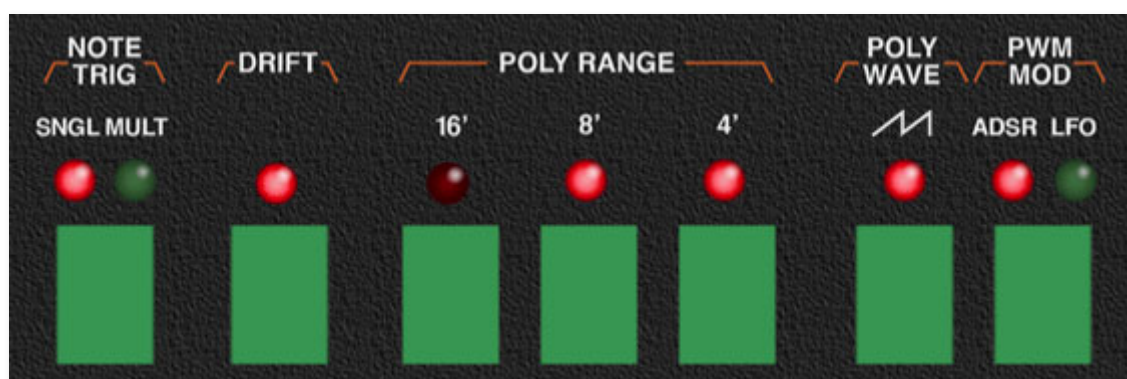
Attack- Defines the length of time for voltage to rise from zero to maximum volume when a key is played.

Decay- Defines the length of time for voltage to fall from the attack stage max volume to sustain stage setting.

Sustain- Sets the voltage level following attack and decay phases while a note is held.

Release- Defines the length of time for voltage to fall from sustain level to silence when a key is released.

Buttons



Note Trig / Single/Multi- As discussed in the Big Wordy Paragraph above, the Poly Synthesizer section has a single envelope generator. The Note Trig setting affects how the envelope responds when keys are played.

- *Single*- If a note is currently playing and an additional note is played, any new notes play from whatever phase the envelope generator is currently

at.

- **Multiple**- If a note is currently playing and an additional note is played, any new notes played reset the envelope to the beginning of the attack phase, affecting all currently held notes.

Though this isn't as realistic as the individual note articulations of having separate envelope generators for each note, it's usually fine for sustained sounds. It also lets you do one really nifty rhythmic trick: with the envelope is set to a percussive curve (fast attack, relatively short decay, low sustain level), hold a chord with your right hand and repeatedly stab at a single note with your left. Fun, right?

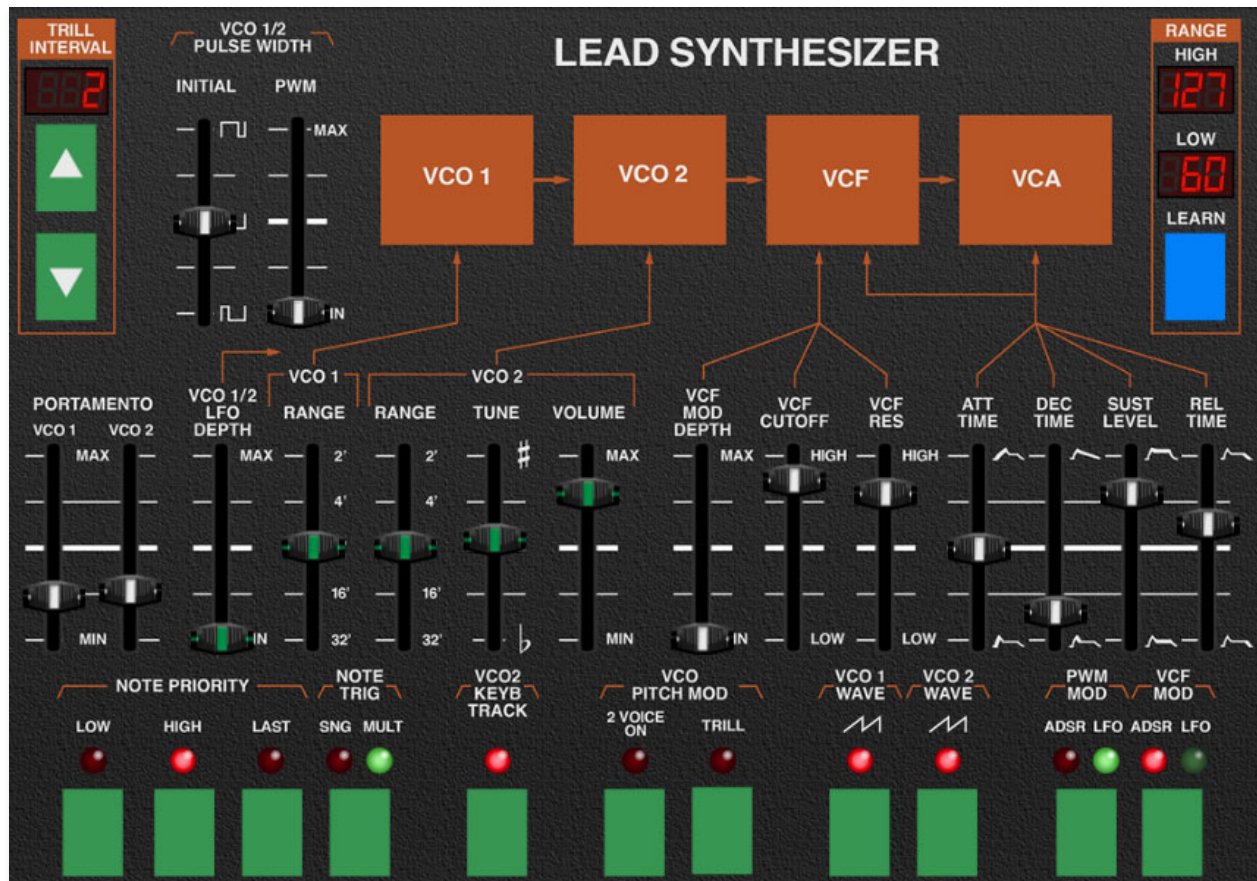
Drift- Adds some natural pitch randomness to individual Poly Synthesizer notes. This is really helpful for adding some life and movement. (The divide-down oscillators of the original were VERY in tune, which can sound pretty dull).

Poly Range- These select the octave range, displayed in standard organ footages. Any combination of the *16'*, *8'*, and *4'* settings may be active at any time.

Poly Wave- Click the button repeatedly to cycle through ramp, pulse, triangle, sine, string, spike (or "hollow wave"). The width of the pulse wave is adjusted by the *Poly Pulse Width* controls described above. Only one waveform may be active at any time.

PWM Mod- Toggles the mod source for the *Poly Pulse Width/PWM* slider (at top). ADSR sets the envelope generator as the mod source; LFO uses the global LFO.

Lead Synthesizer Section



The original Quadra's Lead Synthesizer section was essentially a Frankensteined-in ARP Solus dual-oscillator monophonic synthesizer. Though the Solus was overshadowed by the earlier Odyssey, it was a pretty powerful lead synth (it can be heard buzzing away on The Cars' "Think It Over").

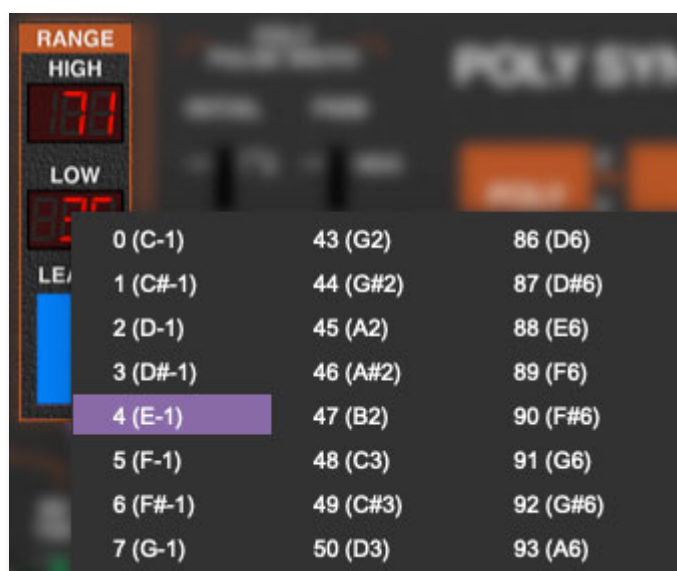


Range

On the original instrument, the Lead Synthesizer section was playable across the entire keyboard, but Quadra lets you specify any MIDI note range with the Key Range controls. When combined with the Bass, Poly Synthesizer, and Lead Synthesizer sections, the split and layer options are endless.

Learn button and Low/High displays- There are two ways to set the keyboard range. The quickest way is via the *Learn* button:

Click the *Learn* button; the number in the *Low* display flashes. Hit the lowest keyboard note you'd like the voice to respond to. The number in the *High* display will now flash; hit the highest note you'd like the voice to respond to. The key range is now set and learn mode is disabled. If you make a mistake, simply repeat the process.



Key range can also be set by clicking on the *Low* or *High* LED numeral displays and selecting the desired note number.

When in the flashing learn mode, the high note can also be selected by clicking the *High* LED numeral display and selecting a MIDI note number; once a note is selected, Quadra will exit learn mode. This can be useful if you'd like to set a top note that's higher than your MIDI controller's highest note.

Learn button and Low/High displays- To set a keyboard range, click the *Learn* button; the number in the *Low* display flashes. Hit the lowest keyboard note you'd like the voice to respond to. The number in the *High* display will

now flash; hit the highest note you'd like the voice to respond to. The key range is now set and learn mode is disabled. If you make a mistake, simply repeat the process. Low and high key range notes can also be set by clicking and dragging on the number displays.

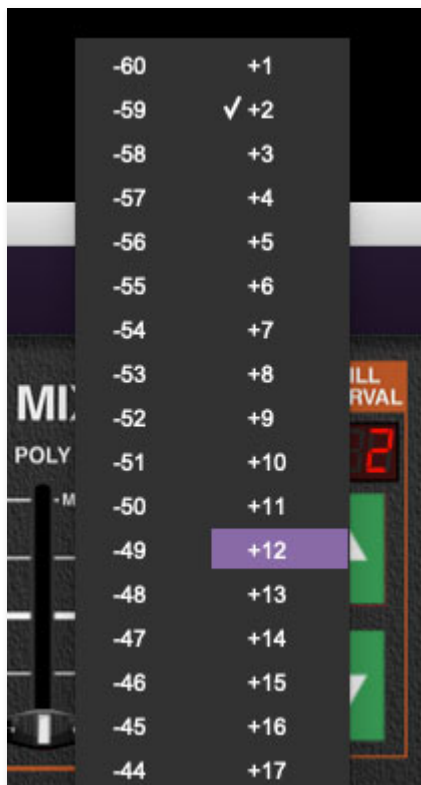
To reset a voice's range to MIDI notes 0-127 (all), simply double-click the Learn button.

Trill

Trill Interval- The ARP Quadra is probably the only synth in history to include this slightly odd feature. It does exactly what you think - it automatically trills back and forth between two notes at the current LFO speed when a single-key is held.

Trill is enabled by clicking the *Trill* button in the VCO Pitch Mod section at the bottom of the Lead Synthesizer. Clicking the button a second time disables it, and then the trill is gone. (That's some dad joke gold right there.)

There are two ways to set the trill interval. Clicking on the green up/down buttons sets the trill interval from the root note in half-steps.



The trill interval can also be set by clicking directly on the LED interval display and selecting an interval.

Cool Things To Do With The Trill Feature

The Trill feature may seem a little silly for any keyboardist with more than one finger(s), but we happened upon some nifty ways to use it while creating Quadra's preset sound library.

- **Videogame Octaves**- Setting the interval to an octave up or down with a relatively rapid LFO speed creates the quick alternating octaves often heard in vintage Nintendo games. (And remember that the LFO speed is easily synced to DAW project master tempo.)
- **Arpeggiated Trills**- Expanding on the preceding example, try setting *Trill Interval* to an octave or a fifth, enable *Sync* on the LFO and Arpeggiator, and experiment with the Lead Synthesizer's envelope *Decay* and *Release* settings. Also experiment with the LFO and Arpeggiator *Speed* controls. The idea here is that the audibility of the trilled notes gets controlled by the *Decay* or *Release* settings. The "Marathons" factory preset is a good demonstration of this.

VCO 1/2 Pulse Width / Initial- Manually sets the width or "duty-cycle" of the pulse wave (one or both of the green *VCO 1 Wave/VCO 2 Wave* pulse wave buttons must be selected to hear it). This control has no effect on saw waves. This defaults to 50%, i.e., a perfect square wave. Moving the slider up or down from center position narrows its width as well as the thickness of sound until it almost disappears at its extremes.

VCO 1/2 Pulse Width / VCO 1/2 PWM- Depending on the setting of the green *PWM Mod* button, Pulse width is modulated either by the Lead Synthesizer ADSR envelope generator or by the global LFO. The *PWM* slider sets modulation depth.

Portamento / VCO 1/VCO 2- Also known as "glide," portamento delays the voltage change between pitches for a sliding effect. Each oscillator has its own *Portamento* amount control, which allows portamento to be applied to one oscillator only, or at different speeds for each oscillator.

Pitch LFO Depth- Sets the depth of global LFO modulation for both oscillators, from zero up to a maximum of three octaves. This is useful for vibrato, sirens, rising/falling pitches, etc., depending on the currently selected LFO waveform. Slider resolution is finer at lower settings to make it easier to set up useful vibrato depths.

VCO 1 / Range- Sets VCO 1's octave range, displayed in standard organ footages. This slider moves in half-step increments allowing easy setting of intervals.

VCO 2 / Range- Sets VCO 2's octave range, displayed in standard organ footages. This slider moves in half-step increments allowing easy setting of intervals.

VCO 2 / Tune- Allows fine tuning of VCO 2's frequency, up or down by just over a fifth.

VCO 2 / Volume- Sets VCO 2's overall volume. VCO 1 will always be at "full blast," and the overall Lead Synthesizer volume is set in the Output Mixer section.

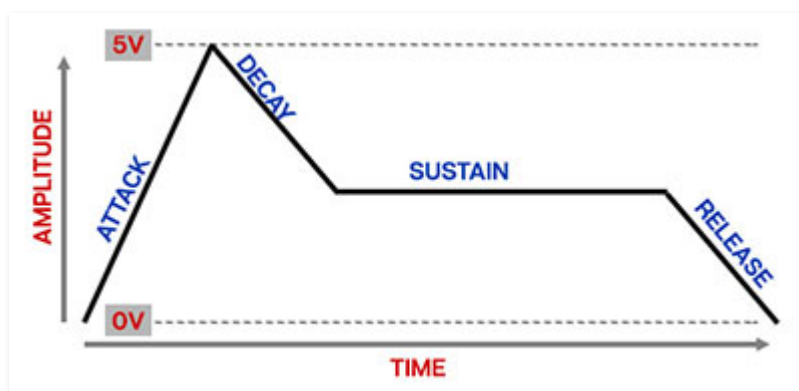
VCF LFO Depth- Sets the amount of VCF cutoff frequency modulation via either the Lead Synthesizer's envelope generator or the global LFO, depending upon the current setting of the *VCF Mod* button in the bottom right corner.

VCF Cutoff- Sets the frequency where attenuation of high-frequency attenuation begins, from 20 Hz up to 24,000 Hz.

VCF Res- Short for "resonance," this 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 higher settings, you'll hear the familiar analog synthesizer "weeooww" sound.

Lead Synthesizer Envelope Generator

If you're not familiar with the operation of ADSR envelope generators, here's the same exciting and educational primer, cut and pasted from the preceding Poly Synthesizer section.



When the Lead Synthesizer section sees a gate voltage from a note, the envelope generator outputs a dynamically changing voltage, according to the settings of its four stages. The attack stage defines how long it takes for

the amplitude to rise from silence to max volume. Once the attack stage reaches max volume, it moves to the decay phase, which defines how long it takes to fall from max to the level of the Sustain phase. Unlike the attack, decay, and release phases, which define times, sustain sets the held volume level following the attack and decay phases as long as the key is held. Finally, the release slider defines the the length of time it takes for amplitude to fall back to silence when when the key is released.

Attack- Defines the length of time for voltage to rise from zero to maximum volume when a key is played.

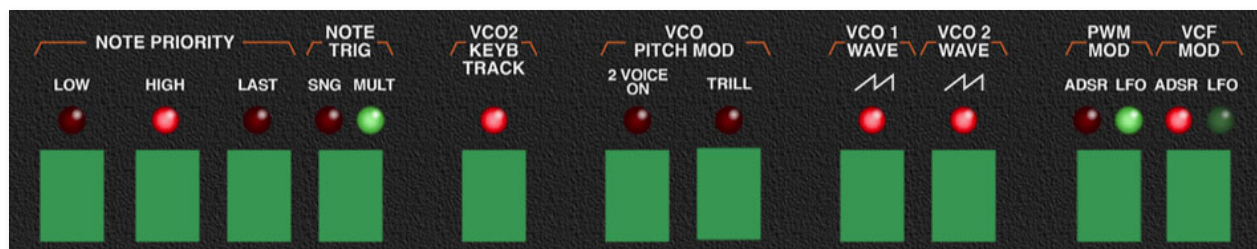
Decay- Defines the length of time for voltage to fall from the attack stage max volume to sustain stage setting.

Sustain- Sets the voltage level following attack and decay phases while a note is held.

Release- Defines the length of time for voltage to fall from sustain level to silence when a key is released.

The Lead Synthesizer envelope section in the original Quadra didn't have a sustain slider - it was fixed at full, as they assumed you were going to wail away with sustained sounds. We added a *Sustain* level control, because we're cool, and we get slider pots *real* cheap.

Buttons



Note Priority / Low/High/Last- The Lead Synthesizer is a monophonic synth; that is, it usually can only play one note at a time (unless *2 Voice On* is enabled, explained below). If more than one key is played, *the Low, Last,* and *High* buttons determine which note is heard.

The default setting of *Last* (i.e., most recent note) is typically the most useful for blasting around the keyboard playing leads, but in the Quadra, the *Low* and *High* modes are particularly useful. For example, the *Low* mode is useful if you're a playing a two-handed passage and you'd like your left-hand pinky to play bass notes on the Lead Synthesizer. Conversely, *High* priority mode is

useful if a two-handed passage is played and you always want the Lead Synthesizer to play a high lead line.

Note Trig / Single/Multi- As discussed in the Lead Synthesizer Envelope Generator section above, the Lead Synthesizer section has a single envelope generator. The Note Trig setting affects how the envelope responds when keys are played.

- *Single-* If a note is currently playing and an additional note is played, any new notes play from whatever phase the envelope generator is currently at. *Single* mode is reminiscent of playing a note a guitar string, then sliding your finger up and down the string without plucking again; it's useful for smooth leads.
- *Multiple-* If a note is currently playing and an additional note is played, any new notes played immediately reset the envelope to the beginning of the attack phase. Because *Multiple* mode instantly fires the envelope every time a note is struck, it has a more responsive feel, and is good for aggressive, repeating bass lines, for example.

VCO 2 Keyb Track- Enables and disables standard half-step keyboard tracking of the pitch for VCO 2. Usually, you'll leave this on for standard playing, but there are a couple of situations where it's handy to disable it.

When disabled, VCO 2's pitch is determined by the setting of its *Range* and *Tune* sliders, and its pitch will not be affected by mod from the *VCO 1/2 LFO Depth* slider or incoming pitch bender data.

There are two situations where disabling VCO 2's keyboard tracking is useful:

- *Drones-* If you'd VCO 2's pitch to play the same note regardless of the note playing on the keyboard. This only affects VCO 2; VCO 1 will track the keyboard as usual, so some neat effects are possible.
- *Constant LFO Sample and Hold Signal-* Things are gonna get a little heady here, so fasten your propellerhead beanie. If you're unfamiliar with how a sample and hold operates, please read the **LFO Section**.

Typically, a sample and hold uses a white noise generator as a "sample" source; this results in totally random voltages at its output. The original Quadra didn't have an onboard noise source, so it used VCO 2's ramp wave instead. For all intents and purposes, this gave the same results at audio rates, i.e. totally random voltage output, especially when combined with the fact that the ramp wave pitch differs depending on the currently played keyboard note. This is all fine and well if we'd like our sample and hold to output random voltages.

However, sample and hold is capable of more than just random, stepped voltage outputs. For example, if our incoming ramp wave is moving at sub-audio rates, and the LFO clock is moving at a slightly faster rate, "stairstepped" patterns become audible. All manner of interesting stepped patterns can be created using VCO 2's ramp, sine, triangle, and even the pulse wave (this works best when the LFO *Sync* switch is engaged, btw).

Remember when we said that the degree of randomness increases because each keyboard key causes VCO 2 to sound at a different pitch? When *VCO 2 Keyb Track* is enabled, our nifty "stairstep" patterns will sound differently on every single key of the keyboard - generally not the desired result. Disabling keyboard tracking with the *VCO 2 Keyb Track* button provides a constant signal source for the sample and hold, and allows consistent stairstepped modulation across the entire keyboard. It's kinda like getting the world's coolest layered polysynth with a free ARP 2600 thrown in!

A couple of additional notes: At audio frequencies, *any* wave will be changing so rapidly that the results will be basically the same as using a noise source. Because of this, when *VCO 2 Keyb Track* is disabled, VCO 2's range shifts downward three octaves, allowing it to operate at sub-audio LFO frequencies when the *Range* slider is at lower settings, and making it much more useful for the sample and hold shenanigans described above. Conversely, waveform mod "shapes" are clearly audible at sub-audio frequencies.

When using VCO 2 as the sample signal source for the sample and hold, it's a good idea to turn the VCO 2 *Volume* slider all the way down, particularly at sub-audio frequencies, otherwise, you'll hear constant clicks (which could be useful in some wacky patch).

VCO Pitch Mod / 2 Voice On- This is a special mode seen on a number of classic ARP monosynths that allows two notes to be played simultaneously (both notes share filter and envelope settings since the Lead Synthesizer section only has a single filter and envelope generator).

If only one key is played, the Lead Synthesizer plays normally, i.e. the same pitch is heard from both oscillators. If a second key is played while one is held, the pitch CV is "split" and a separate pitch is heard from each oscillator.

2 Voice mode is especially fun and creative when layered with the Strings and/or Poly Synthesizer, and even more so with the *Portamento* sliders up. In technical terms, you can make a heckuva racket this way!

VCO Pitch Mod / Trill- Enables note trill mode, explained in the *Trill* section above.

VCO 1 Wave- Click the button repeatedly to cycle through ramp, pulse, sine, triangle, or noise. The width of the pulse wave is adjusted by the *Poly Pulse Width* controls described above. Only one waveform may be active at any time.

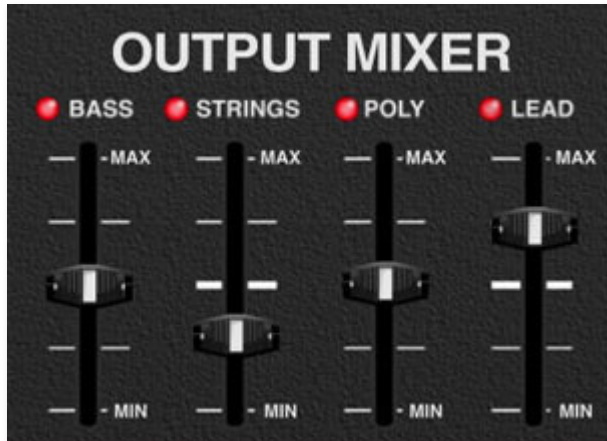
VCO 2 Wave- Same as VCO 1, but with the addition of sawtooth. Click the button repeatedly to cycle through saw, ramp, pulse, sine, triangle, or noise. The width of the pulse wave is adjusted by the *Poly Pulse Width* controls described above. Only one waveform may be active at any time.

The saw and ramp waves are inverted versions of the same and sound identical. We included both for use with the LFO sample & hold - this allows ascending and descending sample & hold modulation. (See the *VCO 2 Keyb Track section* above for more about this.)

PWM Mod- Selects the mod source for the *VCO 1/2 Pulse Width / PWM* slider (at top). ADSR sets the envelope generator as the mod source; LFO uses the global LFO.

VCF Mod- Selects the mod source for filter cutoff frequency. ADSR sets the envelope generator as the mod source; LFO uses the global LFO.

Output Mixer



Output signals from all four sections are combined in the Output Mixer section. Keep an eye on the stereo Output Level meter in the Master section at the bottom right to make sure the output section is getting overdriven.

Note that the Output Mixer faders are post effects - that is, they adjust the volume after the effects in the bottom row are applied.

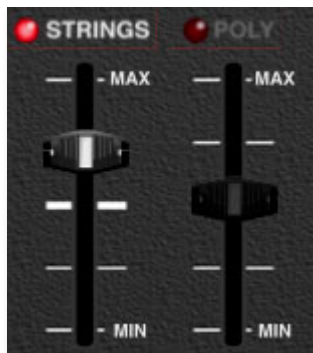
Bass slider- Sets the level of the Bass synth. The LED acts as a combination "signal present" indicator and a VU meter that gets brighter as the signal gets louder.

Strings slider- Sets the level of the Strings synth. The LED acts as a combination "signal present" indicator and a VU meter that gets brighter as the signal gets louder.

Poly Synthesizer slider- Sets the level of the Poly Synthesizer. The LED acts as a combination "signal present" indicator and a VU meter that gets brighter as the signal gets louder.

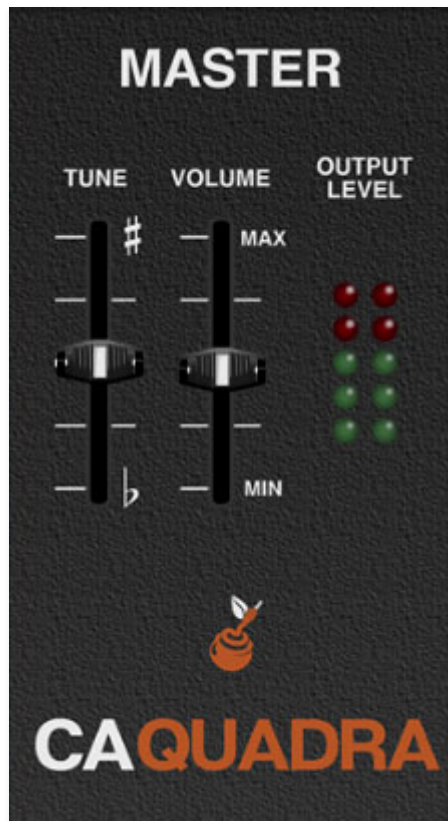
Lead Synthesizer slider- Sets the level of the Lead Synthesizer. The LED acts as a combination "signal present" indicator and a VU meter that gets brighter as the signal gets louder.

Mixer Channel Muting



This is a super-handly hidden feature: clicking on the Bass, Strings, Poly, or Lead text will mute the associated synth section. The text label and fader cap turns dark to indicate the channel is muted. To unmute, click on the appropriate text label again. Mute status is saved with presets.

Master



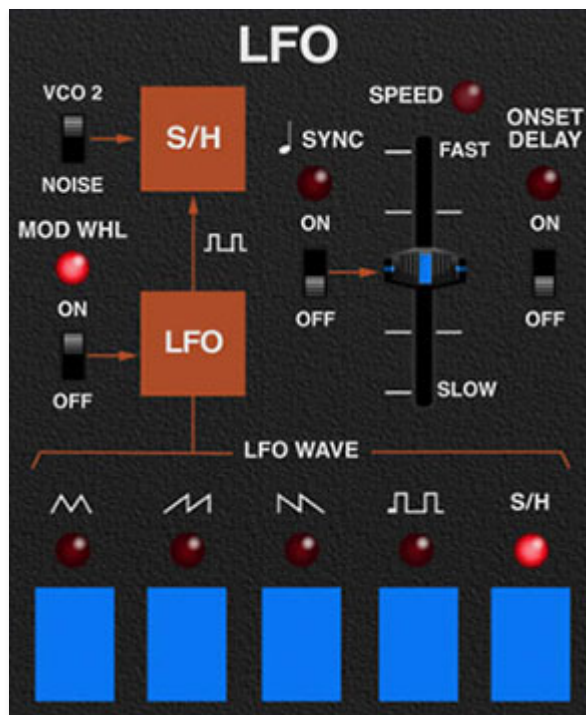
The master controls affect overall pitch and volume. Like all Quadra controls, these settings save with patches.

Tune- Sets the overall tuning for the entire instrument up or down by just over five semitones.

Volume- Controls the overall instrument volume.

Output Level- Overall output level meters. You'll want to optimize these via the Output Mixer and Master *Volume* sliders. Try to keep this out of the red or you may experience ugly digital clipping.

LFO Section



The LFO (low-frequency oscillator) generates sub-audio range signals for modulation purposes. The Quadra contains just one LFO; it can modulate the Poly Synthesizer and/or Lead Synthesizer parameters, depending on current settings.

VCO 2 / Noise- Selects the sample source when the sample & hold (*S/H*) LFO wave is selected; it has no effect on other LFO waves. Check out the ***Sample & Hold*** section below for more information.

Mod Wheel- This is a really handy but potentially confusing feature, so don't skim this section. If the slide switch is in the *Off* position, the LFO is always "on." Its effects will be immediately audible by moving the LFO depth sliders in the Poly Synthesizer, the Vibrato Depth slider in the Lead Synthesizer, or LFO pulse width mod in either. Clicking to the *On* position enables control of LFO depth with an external keyboard controller mod wheel. If the mod wheel is all the way down, the LFO depth is zero. This makes setting up a mod wheel to add vibrato or wah effects really easy. **If it seems like the LFO isn't working, make sure the *Mod Wheel* switch isn't engaged.**

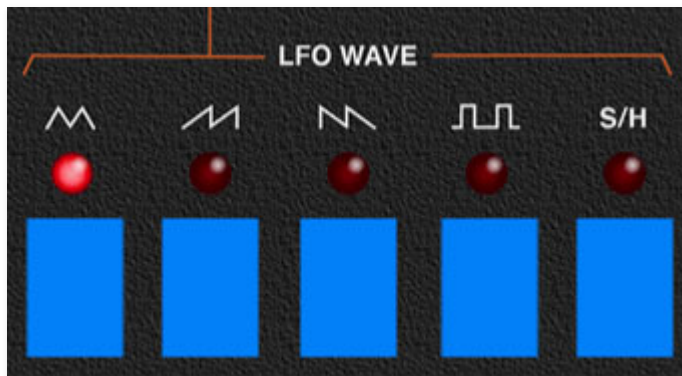
Sync- When the *Sync* switch is enabled, LFO speed will lock to the host tempo when using Quadra within DAW software or to the current tempo in the top menu bar when using the standalone version.

Speed- The *Rate* slider sets the speed of the LFO, from 0.10 to 100 Hz (with *Sync* switch off), or from 8 beats up to 1/64th note triplets (*Sync* switch on). The LED beside the *Rate* slider flashes at the current LFO rate.

When the *Mod Wheel* switch is in the on position, the *Delay* switch grays out and is disabled (because delaying the onset of LFO mod when turning up the mod wheel would be super confusing and not very useful).

Onset Delay- On the original ARP Quadra, the LFO had a "built-in" delay. If no notes were currently sounding and a note was played, it would take a little over a second to gradually kick in. We're not sure if this was by design or not, but it's a nice effect, so we've included a switch to enable it. Since the Quadra has just one global LFO, the delay will be the same for any section using the LFO (Poly Synthesizer, Lead Synthesizer, or the phaser shifter sample in sample & hold mode).

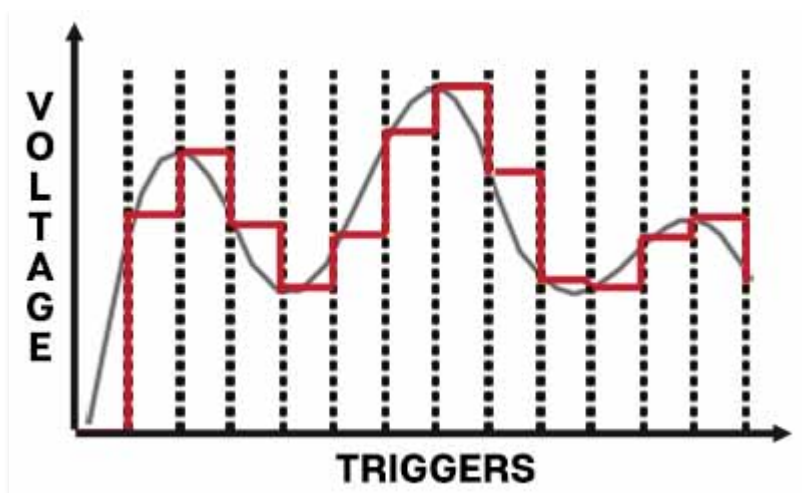
Buttons



LFO Wave- Selects the cycling pattern of the LFO. Available waveforms are triangle, ramp, saw, square and sample & hold (S/H). Only one LFO wave can be active at any time.

LFO Sample & Hold

Sample & hold repeatedly “samples” an input signal and outputs a held constant voltage until triggered again. In the image below, the smooth gray line depicts a continuous input signal. Each time the sample & hold is triggered, the current voltage is “sampled” and “held” until the next trigger. The red line shows the resulting stepped output signal.

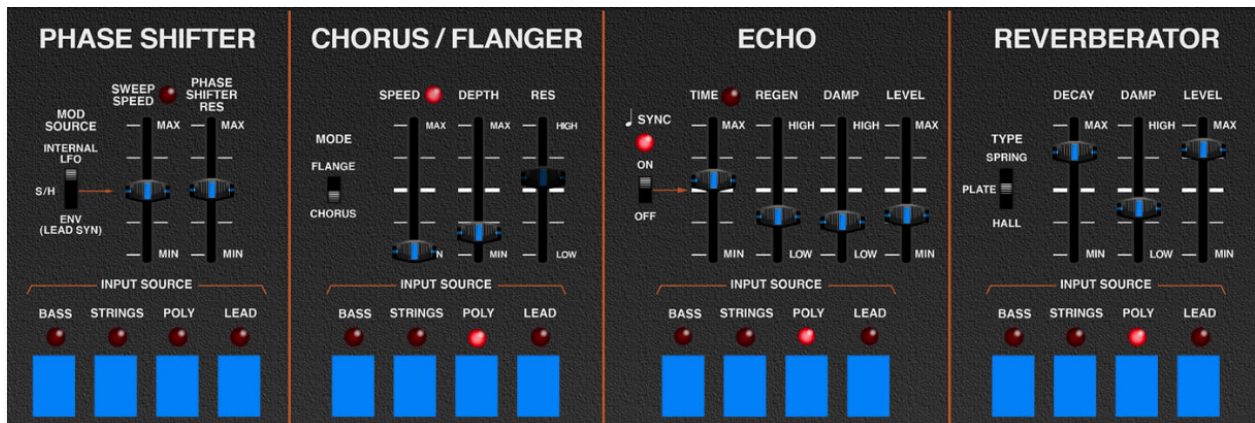


White noise is typically used as an input source to generate a random stepped-pitch CV signal, made famous in a zillion sci-fi movies, usually as the sound of a robot (because sample & hold sections are standard equipment for all robots).

The *VCO 2 / Noise* select switch next to the orange S/H box indicates the sample source. Its voltage gets "sampled" at intervals defined by the current LFO *Speed* setting. The sampled voltage is held until the next LFO clock. If VCO 2 is set to a high pitch, the result will sound like random voltages; at lower pitches (i.e. *VCO 2 Keyb Track* button disabled), rising or falling note patterns will be audible when modding pitch. If you're tricky with the LFO rates, pseudo-random, repeating sequences can be created (the *Sync* switch works especially well here).

For more information on how to effectively use LFO sample & hold modulation (and how it interacts with the Lead Synthesizer *VCO 2 Keyb Track* button), please have a look at **Buttons/VCO 2 Keyb Track** in the **Lead Synthesizer** section.

Effects

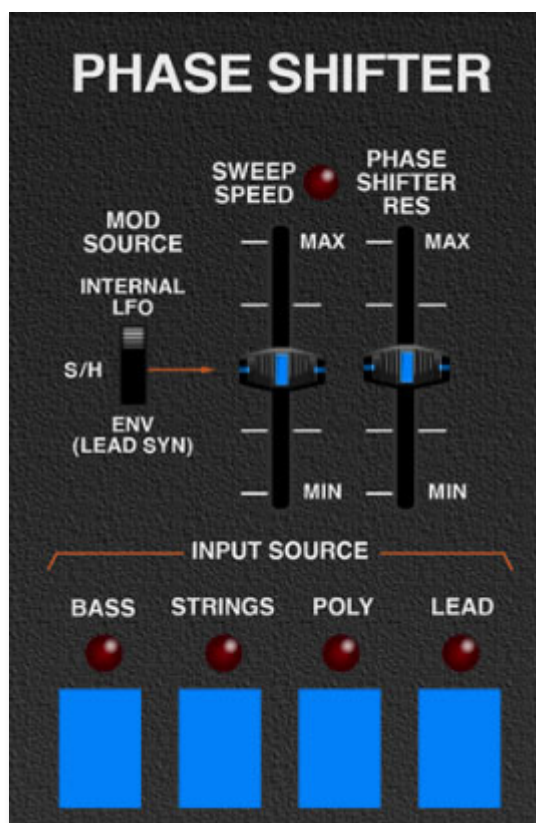


The original ARP Quadra had only one effect: a super great-sounding phase shifter. It was configured in such a way that any or all of the four synth sections could be routed through it.

We've accurately replicated the phabulous phase shifter, and greatly expanded the effects palette with a chorus/flanger, an echo, and a studio-quality reverb. We also retained the individual routing concept: each of the four synth sections can be individually routed to each effect, allowing super flexible effects routings. It's really suited to the Quadra and makes for great stacked synth sounds.

Phase Shifter

As advertised, the super-sweet sounding ARP Quadra Phase Shifter, including its unique modulation options.



Mod Source- Selects the mod source for the Phase Shifter sweep.

- **Internal LFO**- This the "standard" mode, using the Phaser Shifter's internal triangle-wave LFO to sweep the frequency. The Phase Shifter LFO is independent of the Quadra's global LFO.
- **S/H**- Phase Shifter frequency is modulated by the global LFO Sample and Hold mod output (see the **LFO** section for more information about the Sample and Hold)
- **Env (Lead Synthesizer)**- Phase Shifter frequency is modulated by the Lead Synthesizer's envelope generator. This is a somewhat unique feature of the original instrument, and there are a few things to be aware of.

The Lead Synthesizer's envelope will only trigger within the currently specified key range, regardless of its current level in the Output Mixer. If the envelope doesn't seem to have any effect on the Phase Shifter, make sure the Lead Synthesizer's key range is active in the range you're playing.

Also be aware that the Lead Synthesizer's current *Note Priority* and *Note Trig* settings all apply to the envelope generator when it's used as the Phase Shifter mod source.

Sweep Speed- Sets the speed of the Phase Shifter's internal LFO when the *Mod Source* switch is set to *Internal LFO*. When the *Mod Source* switch is in the *S/H* or *Env (Lead Synth)* position, the *Sweep Speed* slider is disabled and appears dimmed.

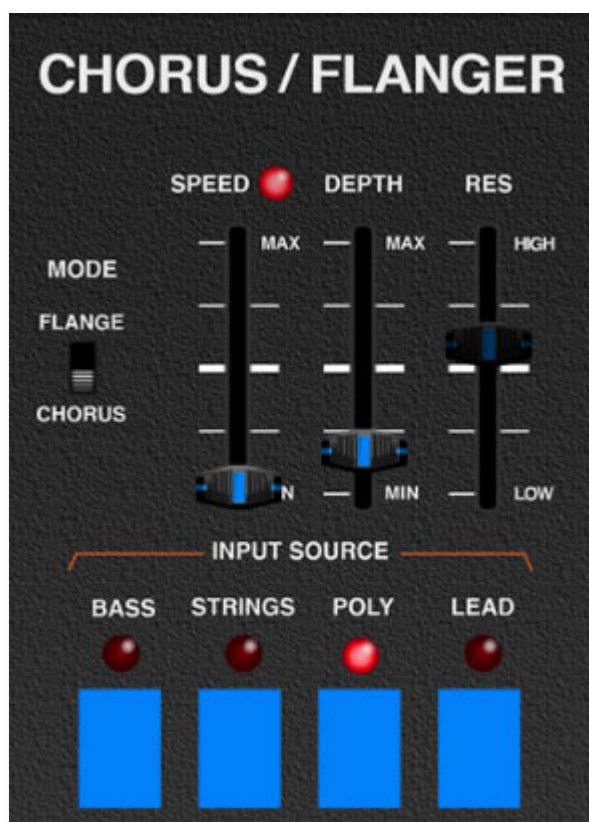
Phase Shifter Res- This sets the amount of internal feedback, increasing the intensity of the Phase Shifter effect.

Buttons

Input Source buttons- Enables input of each synth section to the Phase Shifter. These can be set in any combination.

Chorus/Flanger

We've included a thick and warm Chorus/Flanger effect. Note that this is separate from the String Chorus Generator associated with the Strings and String Bass sections.



Mode- Selects the base delay time (flanging uses shorter delay times than chorus).

Speed- Sets the modulation speed. The LED flashes at the current mod rate.

Depth- Sets effect depth, i.e. the amount of speed modulation.

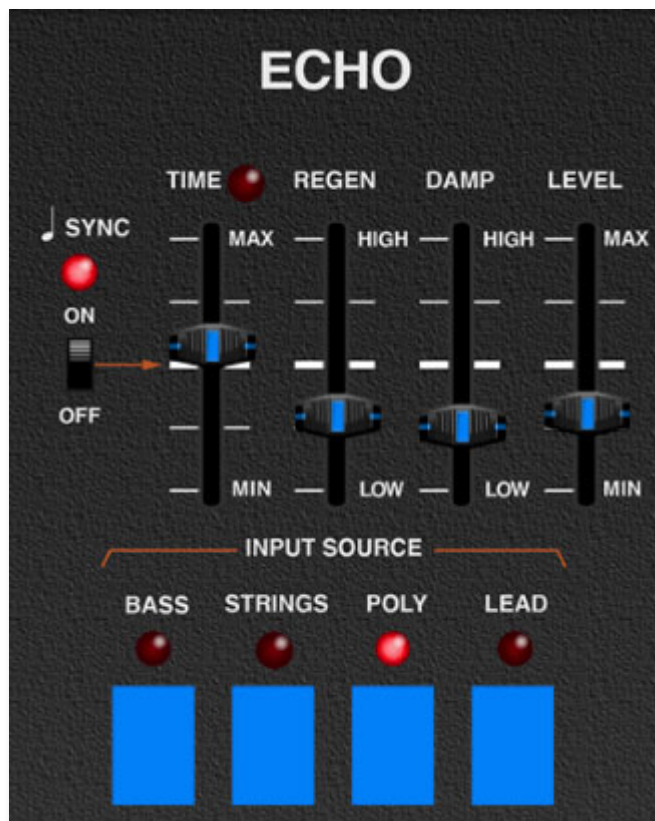
Resonance- Sets the amount of internal feedback. This increases the intensity of the flanging effect when in *Flange* mode. Chorus does not make use of feedback; **the Resonance slider is disabled when the mode switch is in *Chorus* mode.**

Buttons

Input Source buttons- Enables input of each synth section to the Chorus/Flanger. These can be set in any combination.

Echo

A handy and DAW-sync-able delay effect.



Sync- Enabling the *Sync* switch locks the delay time to the master tempo. When engaged, the *Time* knob snaps to note values ranging from 1/64th note triplet to 8 beats. *Sync* mode locks to the tempo in the top toolbar when using the standalone version or the current project tempo when using the plug-in version in a DAW.

Time - Sets delay time from 1 to 2000 ms. If the *Sync* button is enabled, time settings snap to synchronized note values (see preceding *Sync* switch).

The LED beside it flashes at the current rate, and the number display shows the exact time.

Regen- Routes the output to the input for additional repeats.

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

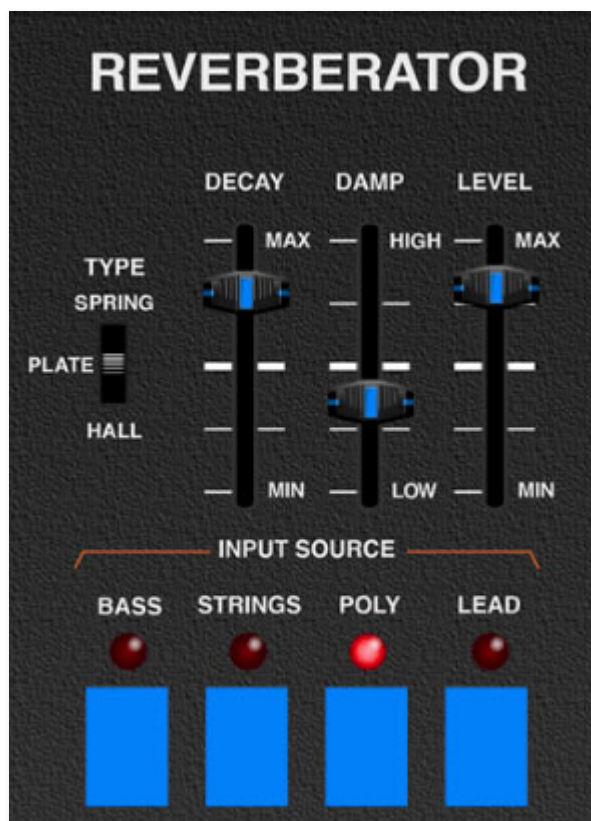
Level- Sets the amount of wet echo signal mixed with the dry signal.

Buttons

Input Source buttons- Enables input of each synth section to the Echo. These can be set in any combination.

Reverberator

A smooth, studio-quality reverb.



Reverb Type- Allows selection of *Spring*, *Plate*, or *Hall* reverb types.

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

Damp- Attenuates high frequencies as the slider amount is increased.

Level- Sets the level of the wet reverb signal.

Buttons

On/Off- Enables and disables the Reverb effect.

Input Source buttons- Enables input of each synth section to the Reverb. These can be set in any combination.

"Hey, Are The Effects In Stereo?"

Like the original, the Phase Shifter is mono - it makes sense to do it this way because a phase shifter is essentially a specialized type of modulated synth filter.

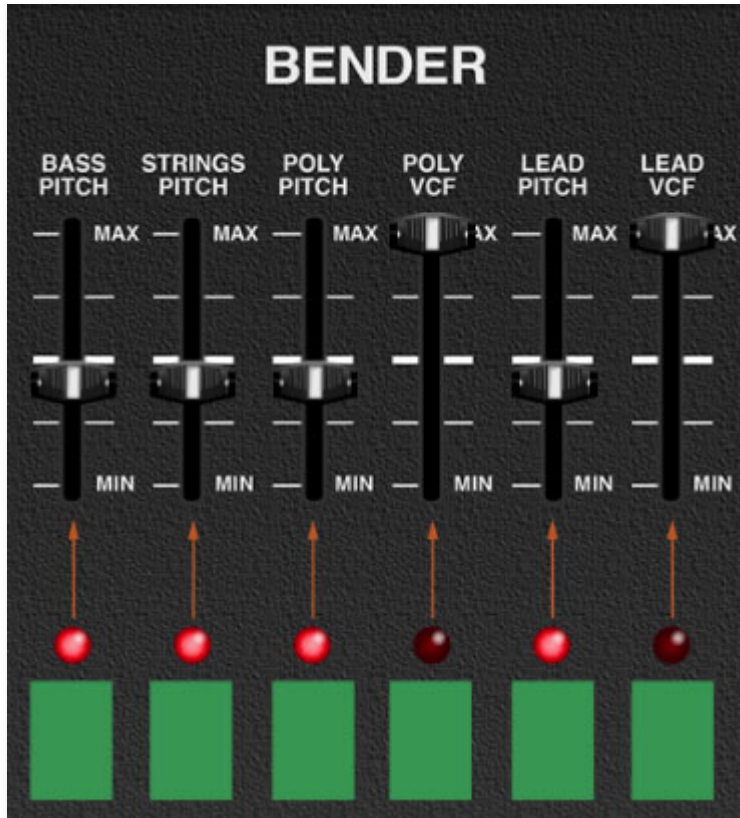
The Chorus/Flanger is true stereo; that is, it's actually two separate delay lines with inverted LFO sweeps. This means it does a swell job of stereoizing mono signals.

The Echo section behaves like a mono delay (i.e., it won't stereo-ize a mono signal), but under the hood, it is true stereo. This was done because it follows the Chorus/Flanger in the signal path, and we didn't want it to collapse the preceding stereo Chorus/Flanger signal down to mono.

The Reverberator is true stereo, and like the Chorus/Flanger, it will also stereo-ize mono input signals (or maintain the Chorus/Flanger's stereo imaging, should you be using it).

And in case anyone's asking, the tri-chorus that's baked into the Strings section (and completely unrelated to the Chorus/Flanger) is mono, like the real thing.

Bender Controls



Since the Quadra essentially contains four independent synths, it's nice to have the ability to independently control how each is affected by incoming pitch bender control. Specifically, Cherry Audio Quadra lets you control on/off and pitch bend depth for all four sections, as well as opening or closing the filter cutoff setting for the Poly Synthesizer and Lead Synthesizer.

Bass Pitch and enable button- When enabled with the green button, the *Bass Pitch* slider sets the pitch bend amount up to a maximum of one octave. The LED illuminates when active.

Strings Pitch and enable button- When enabled with the green button, the *Strings Pitch* slider sets the pitch bend amount up to a maximum of one octave. The LED illuminates when active.

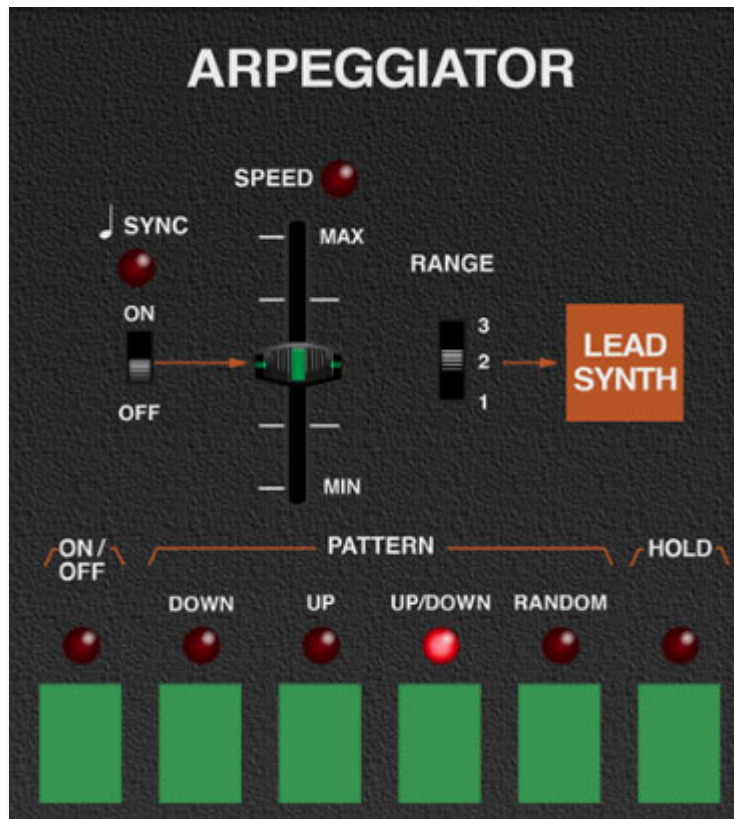
Poly Pitch and enable button- When enabled with the green button, the *Poly Pitch* slider sets the pitch bend amount up to a maximum of one octave. The LED illuminates when active.

Poly VCF and enable button- When enabled with the green button, the *Poly VCF* slider sets the amount the pitch bender will open or close the filter cutoff frequency. The LED illuminates when active.

Lead Pitch and enable button- When enabled with the green button, the *Lead Pitch* slider sets the pitch bend amount up to a maximum of one octave. The LED illuminates when active.

Lead VCF and enable button- When enabled with the green button, the *Lead VCF* slider sets the amount the pitch bender will open or close the filter cutoff frequency. The LED illuminates when active.

Arpeggiator



An arpeggiator is a step sequencer that individually plays each note of a chord in an ascending or descending pattern across one or more octaves. The original ARP Quadra arpeggiator was misleadingly labeled "sequencer" and was a pretty basic affair. We've expanded it with additional modes and functionality.

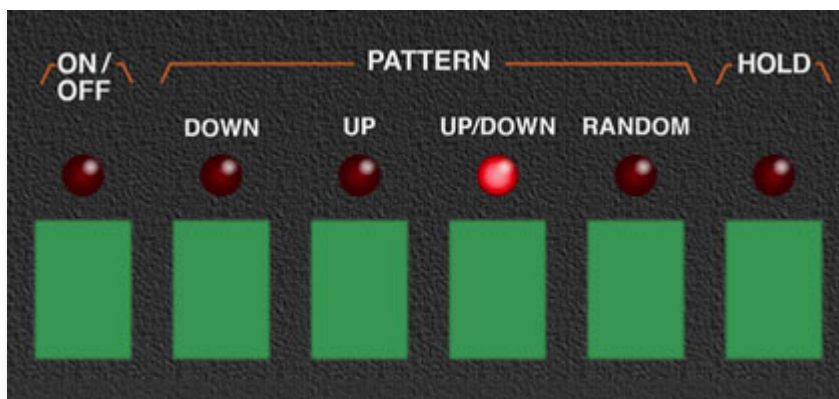
The Arpeggiator only affects the Lead Synthesizer (hence the arrow and big orange box to remind you).

Sync- Engaging the *Sync* switch locks arpeggio timing to master tempo. When engaged, the *Speed* slider snaps to note values ranging from 1/64th note triplet to 8 beats. *Sync* mode locks to the tempo in the top toolbar when using the Quadra standalone version or the current project tempo when the plug-in version is used in a DAW. Arpeggiator sync is especially useful when combined with the Echo section *Sync* switch - try setting the Arpeggiator rate to *1/16*, and the Echo Time to *1/8 Dotted*.

Speed- Sets the rate of arpeggiator play. The LED flashes at the current rate.

Range- Selects how many octaves the pattern will play before repeating.

Buttons



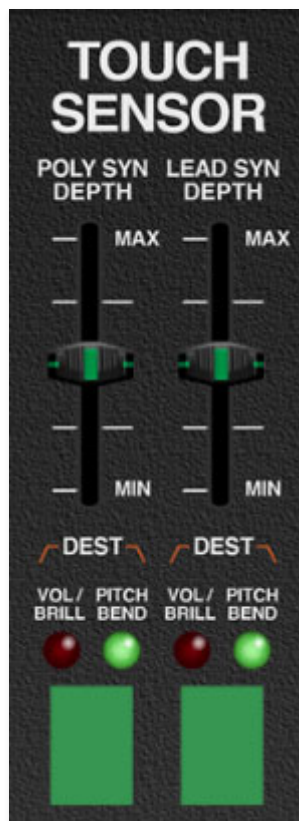
On/Off- Enables and disables the arpeggiator.

Pattern- Selects the order in which the notes of the chord will be played.

- **Down**- Plays notes in order from highest to lowest.
- **Up**- Plays notes in order from lowest to highest.
- **Up/Down**- Plays notes from lowest to highest then back to lowest again (the highest and lowest note will be played twice in a row).
- **Random**- Randomly cycles through notes.

Hold- When engaged, arpeggios continue to run without having to continuously hold down keys. This allows you to play a series of chords without the arpeggiator stopping as keys are released. Be aware that it will not stop until you disengage the button again. Mapping to a sustain pedal or button on a MIDI controller can be useful for conveniently toggling *Hold* on and off.

Touch Sensor



"Touch Sensor" is vintage ARP terminology for what we now refer to as aftertouch, i.e., pressing a key after it's initially played to transmit expressive controller data. You'll need a MIDI/USB controller keyboard that transmits aftertouch to use the Touch Sensor section.

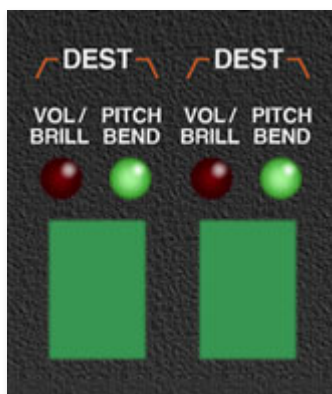
The Touch Sensor/aftertouch is compatible with controllers that output monophonic aftertouch data or polyphonic aftertouch data. In the case of poly aftertouch, Quadra will see whichever note is pressed the hardest. Given the inherent monophonic/paraphonic nature of the Quadra, it wouldn't be possible for poly aftertouch data to control individual note articulations. MIDI MPE control isn't implemented for the same reason.

On the original ARP Quadra, the Touch Sensor only affected the top three octaves of the keyboard. We've done away with this silliness; the Cherry Audio Quadra responds to aftertouch over its entire range.

Poly Syn Depth- Sets the maximum amount of aftertouch transmitted to the Poly Synthesizer section.

Lead Syn Depth- Sets the maximum amount of aftertouch transmitted to the Lead Synthesizer section.

Buttons



Destination / Vol/Brill / Pitch Bend (Poly Synthesizer)- Toggles the destination for Poly Synthesizer Touch Sensor modulation.

- **Vol/Brill**- This is a two-fer that simultaneously affects the Poly Synthesizer's VCA level and filter cutoff frequency.
- **Pitch Bend**- Affects the Poly Synthesizer's Poly Wave Generators' pitch, up to a maximum of a minor third.

Destination / Vol/Brill / Pitch Bend (Lead Synthesizer)- Toggles the destination for Lead Synthesizer Touch Sensor modulation.

- **Vol/Brill**- This is a two-fer that simultaneously affects the Lead Synthesizer's VCA level and filter cutoff frequency.
- **Pitch Bend**- Affects both of the Lead Synthesizer's oscillators, up to a maximum of a minor third.

Using Quadra Multi Out Version

Each of Quadra's four synth sections can be routed to separate outputs within a DAW virtual mixer. This is useful for individual panning, using third-party effects plug-ins, or routing to separate physical outputs of a multi-output audio interface.

The procedure for configuring multi outs varies depending on which DAW you're using, so you may need to consult your DAW's owners manual, or find a YouTube video where some windbag blabbers about nothing for six minutes and explains the actual procedure in the last 12 seconds of the video (Invariably, this video begins with, "*Hey guys...*").

Regardless of which DAW you're using, when loading/opening the Quadra instrument plug-in, select the *Quadra Multi Out* version.

Quadra Multi Out Configuration

Stereo Outputs 1-2 operate exactly the same as the standard stereo version of Quadra; that is, the Output Mixer section controls and onboard effects will all operate as usual.

The individual instrument outputs are always at full volume and unaffected by level slider settings in the Output Mixer section. However, muting sections (by clicking on their name labels) *will* mute their respective individual outputs. **Individual instrument outputs are totally dry- the bottom-row effects are not applied.** The exception to this is the "built-in" Strings section tri-chorus, which has no controls and is always active.

We configured it this way to offer the greatest flexibility for combining Quadra's onboard effects with external processing.

Quadra Multi Out's separate outputs are configured as follows:

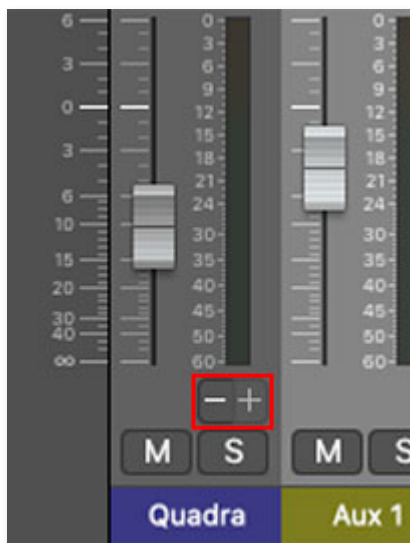
STEREO MIX (OUTPUT MIXER)	1-2
BASS	3-4
STRINGS	5-6
POLY SYNTHESIZER	7-8
LEAD SYNTHESIZER	9-10

Using Quadra Multi Out in Logic Pro

Configuring multi-out instruments in most DAWs is relatively easy, but it's a little trickier in Logic. Essentially, you'll need to add mixer auxiliary channel strips to route separate outputs. If you know your way around Logic's mixer, these can be configured manually, but Logic Track Mixer multi-out instrument channel strips have an easy-to-overlook shortcut that makes it really easy.

For this example, we'll assume you're using the Logic Track Mixer, as opposed to the old-school Logic Environment Mixer.

- Open an instance of Quadra in a DAW instrument channel; make sure to select *Quadra Multi Out*.
- Open the Track Mixer either by clicking the mixer button in the top left of the menu strip (this may or may not be present depending on your Logic setup), or with the top menu *View>Show Mixer*.



- In the main Quadra instrument mixer channel strip, click the **+** button beneath the output meter to add aux channel strips. Repeat this step for each separate out you'd like to use. It should look like the image below.



The aux channel strips can now be used to individually set volume and panning, and third-party effects can be added either to the individual out aux channel strips, or by inserting effects to additional aux channels and using the individual out aux channel strip send knobs. This is the most flexible approach because it allows independent volume and panning adjustment of dry and effect signals.

All mixer channels sum to Logic's master stereo outputs by default. To send Quadra's individual outputs to separate physical outputs on a multi-out audio interface, click the *Outputs* buttons on the individual out aux channel strips (these will say *St Out* by default), scroll down, and select the desired *Output* or *Bus* destination.

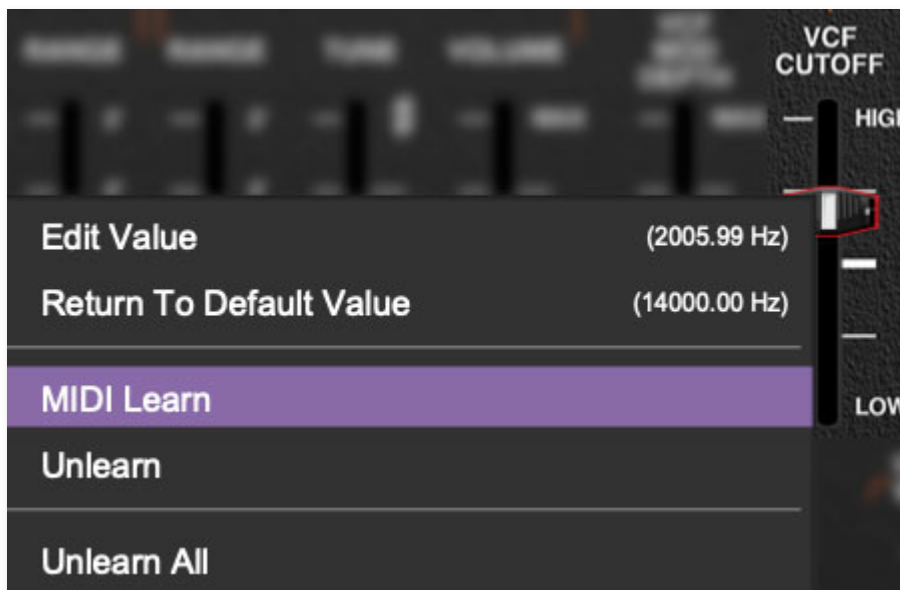
MIDI Controllers Setup and The MIDI Tab

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 Quadra control, then we'll go over all parameters in the MIDI Tab.

Basic External Hardware Control Assignment

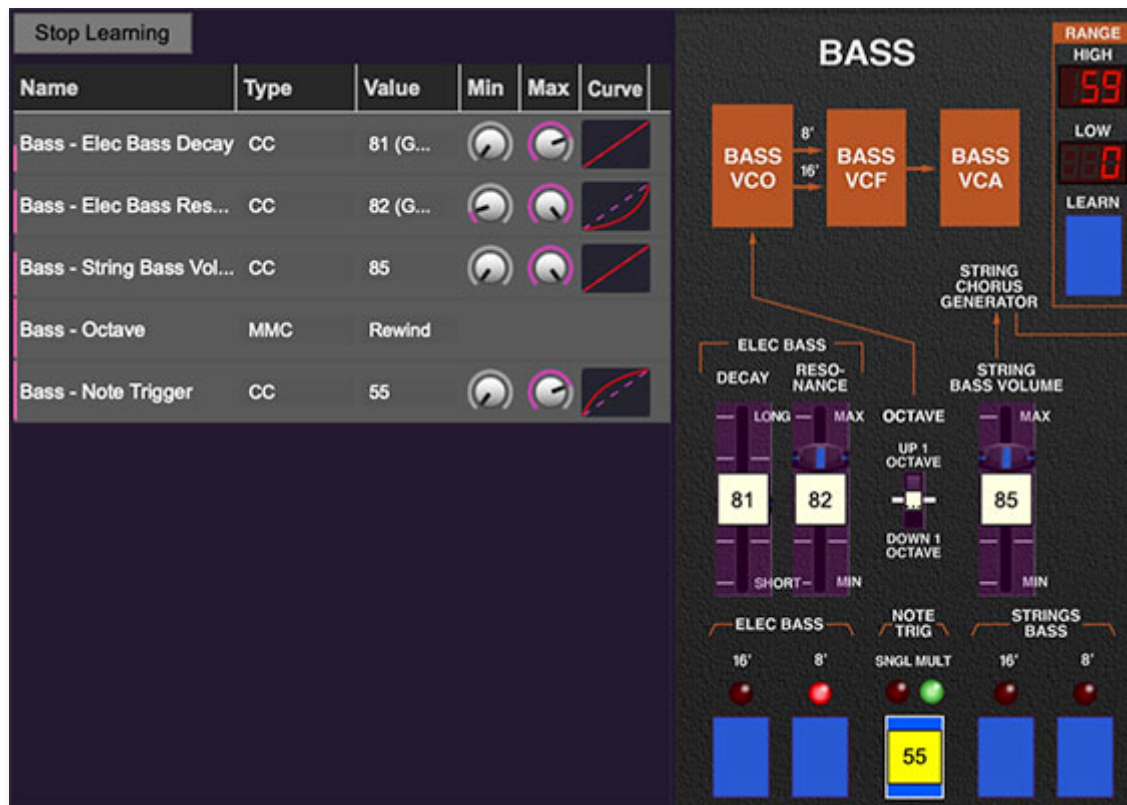
This is the quick, "I just want to assign a hardware control right now!," section. We recommend reading this whole section to best take advantage of Quadra's swell MIDI control assignments.

In this example, we'll assign a hardware slider control to the Lead Synthesizer *VCF Cutoff* slider.



Begin by right-clicking on the *VCF Cutoff* slider in the Lead Synthesizer section and selecting *MIDI Learn*. A transparent purple overlay appears over the slider 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 slider. If you get cold feet (or accidentally put the wrong control into learn mode), learn mode can be aborted by right-clicking and selecting *Stop Learning*.

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



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).












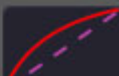
Once a MIDI controller has been assigned, in addition to real-time control of a Quadra parameter, you'll also be able to record and play back controller data from a DAW.

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					
Name	Type	Value	Min	Max	Curve
Bass - Elec Bass Decay	CC	81 (G...			
Bass - Elec Bass Res...	CC	82 (G...			
Bass - String Bass Vol...	CC	85			
Bass - Octave	MMC	Rewind			
Bass - Note Trigger	CC	55			

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 knobs, where Quadra 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 sliders or the buttons of a grid-style controller.

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.

MIDI Tab Columns

Name- Displays the name of the parameter being controlled.

Type- There are five possible types of controller automation in Quadra:

- *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.
- *Aftertouch*- Some 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.

The Touch Sensor section allows fast assignment of aftertouch control to basic Poly Synthesizer and Lead Synthesizer controls, but this can be used to control *any* Quadra parameter.

- *Key*- This allows keys of the computer QWERTY keyboard to act as button controls for Quadra'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.

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.

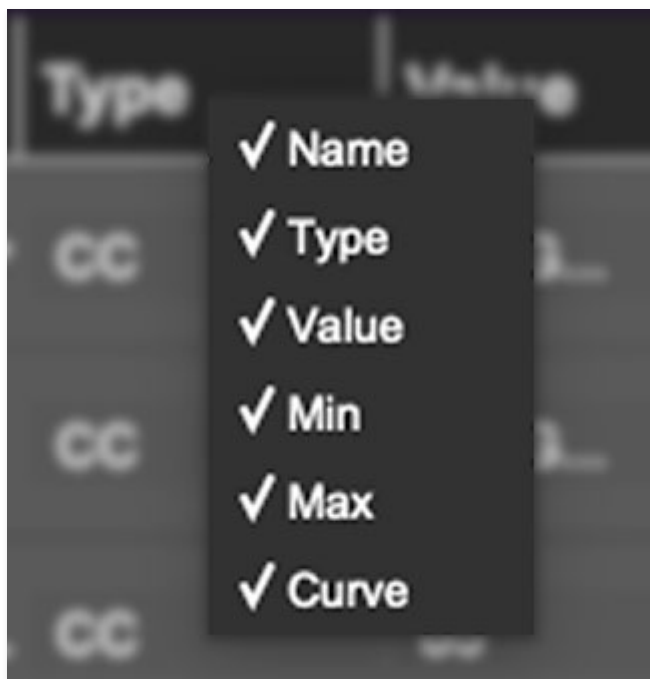
Max- Sets a limit on the highest value any automation control can set a mapped controller to. This actually recalibrates the range of the automation controller to the remaining parameter range.

- ***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. Along with the *Curve* control, the customization possibilities are super flexible.

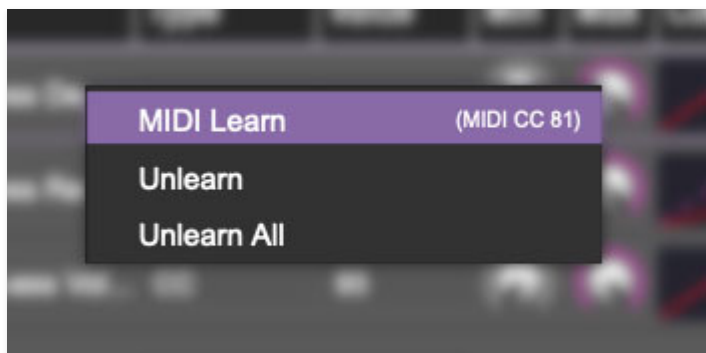
Curve- These allow the customization of how incoming MIDI CC controls affect the movement of Quadra's onscreen controls, ranging from exponential to linear to logarithmic curves.

MIDI Tab Column Configuration Right-Click Menus



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

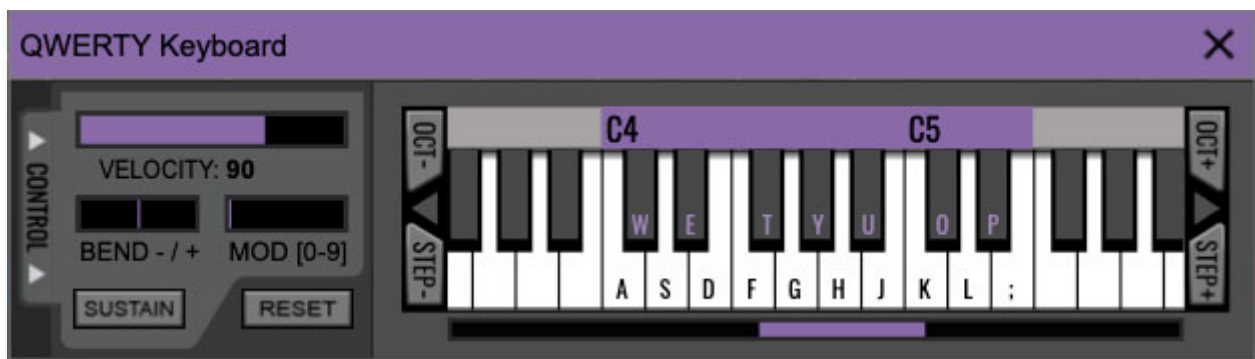


Right-clicking on an assigned parameter opens the menu above.

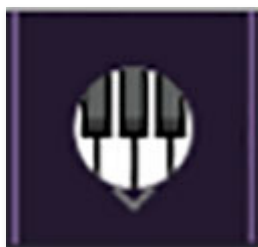
MIDI Learn- This is used to change the controller assigned to a particular parameter.

Unlearn- Deletes the selected automation parameter.

Unlearn All- Deletes all controller assignments for the patch. Quadra 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 standard QWERTY computer keyboard can be used to play notes - we're pretty sure you've got one of those! We'll refer to this as the "MTK." 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 Quadra 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. This will only be audible if the *Touch Sensor* sliders are raised (Touch Sensor was ARP's circa-1980 name for keyboard velocity).

Pitch Bend- To pitch a note or notes, press the + or - computer keyboard keys while playing a note. Bend depth (and which sections respond to bend data) are determined by the settings of buttons and sliders in the *Bender* section at the bottom left of the UI (see the **Bender Controls** section for more information). 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.

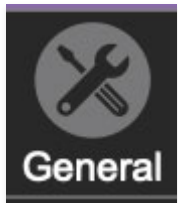
Sustain- The *Sustain* button mimics the functionality of a standard sustain pedal. Click the [TAB] key to engage sustain, or [SHIFT]+[TAB] to lock it. The *Sustain* button can also be engaged by mouse clicking it.

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

Settings

Clicking the settings gear 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 want to tweak is on the front panel, as the heavens intended!

General



- **Add Undo For Control Changes With The Mouse**- Enabling this allows undo of knob/slider/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 Quadra'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 Quadra log file docs.
- **Load Last Preset On Startup (Standalone Only)**- Automatically loads the last preset used when Quadra standalone version is started.
- **Preset Folder**- Displays the current location of Quadra'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.



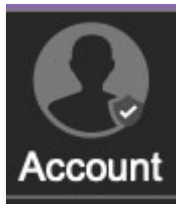
Interface

Allows customization of Quadra's user interface settings.

- **Reset To Default Window Size-** Resets the Quadra workspace to 100%. Use this to reset the window size if Quadra's workspace 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* if you're one those folks that cut their teeth on the *Steinberg Model E VST* back in 2000.
- **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-** Displays parameter tooltips/values next to controls if a control is moved via an assigned MIDI controller or automation.
- **MIDI Program Changes Should Change Current Preset-** Allows MIDI program change messages to change Quadra 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 window pop-up

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, Quadra remembers all 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 Quadra. Click [here](#) for updates about yacht rock superstar, Kenny Loggins.
- **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 Quadra handles updates.
- **Check For Update-** Click this to see if an updated version of Quadra available.

Status:

- **Automatically Install Updates-** Updates are automatically downloaded and installed.
- **Ask Before Installing Updates-** By default, Quadra 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 we recommend enabling *Ask Before Installing Updates* if you're using Quadra for live performances or other mission-critical situations.

- **Never Install Updates**- Quadra 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 do, so we won't use this feature too often. When we do, it'll be for something super cool (like a killer sale), so we recommend leaving it on.



Audio/MIDI

Settings for audio and MIDI hardware input and output.

This tab is only visible in the standalone version of Quadra.

- **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. The biggest audible difference is usually reduced background noise or hum, but external audio hardware also offers greater flexibility in terms of number of inputs and outputs and built-in mic or low-level instruments pres (i.e. electric guitars). These are especially useful if you're using Quadra's external inputs to process sound. The *Test* button will produce a brief sine wave when clicked; this will help with troubleshooting, aka, "WHY THE HECK ISN'T THIS MAKING ANY NOISE?!?"
- **Sample Rate**- This sets Quadra'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 notes aren't playing when using Quadra in standalone mode check to make sure your USB/MIDI controller is checked in this area.**