



MORPHEUS

Stereo Morphing
Z-Plane Filter

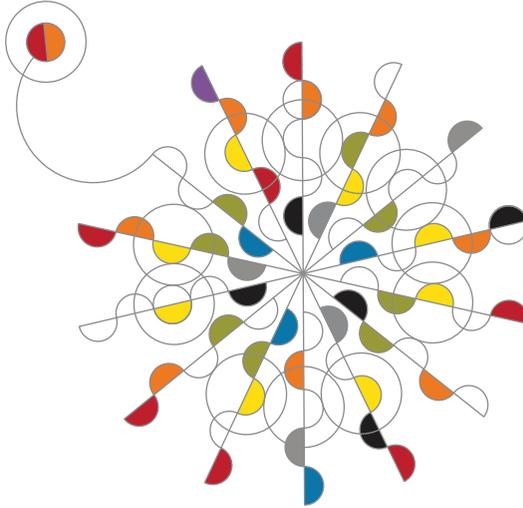
Operation Manual

v1.5_020617

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1. Introduction



Thanks for purchasing (or otherwise acquiring) the Rossum Electro-Music Morpheus Stereo Morphing Z-Plane Filter.

This manual will give you the information you need to get the most out of Morpheus. However, the manual assumes you already have a basic understanding of synthesis and synthesizers. If you're just starting out, there are a number of good reference and tutorial resources available to get you up to speed. One that we highly recommend is:

Power Tools for Synthesizer Programming (2nd Edition)

By Jim Aikin

Published by Hal Leonard

HL00131064

Support

In the unlikely event that you have a problem with your Morpheus, tell us about it here:

<http://www.rossum-electro.com/support/support-request-form/>

... and we'll get you sorted out.

If you have any questions, comments, or just want to say "Hi!," you can always get in touch here:

<http://www.rossum-electro.com/about-2/contact-us/>

... and we'll get back to you.

Happy music making!

2. Installation

As you will have no doubt noticed, the rear of Morpheus is a circuit board with exposed parts and connections. When handling Morpheus, it's best that you hold it by the edges of the front panel or circuit board. It's not particularly easy to blow up, but why take chances?

More specifically, the biggest risk (to the extent that there's a risk), is damage by static electricity. Particularly on dry, cold days (or if you've just shuffled across your shag carpet in fuzzy slippers), make a point of touching the metal panel first, before touching any other part of the module.

While all Rossum Electro-Music modules are protected against reverse polarity damage, both to your module and your system, care should still be taken to connect the power cable correctly. (For more detail on our unique protection method, check out Dave's discussion of Circuit Protection in **Chapter 13**.)

Plug the included 16-pin connector into the header on the rear of the module such that the red stripe on the cable (the -12V side) is on the same end of the header as the "Red Stripe (-12V)" text on the PCB.

Morpheus requires, at most, 135mA of +12V and 25mA of -12V.

We have included both M3 and M2.5 (for vector rails) mounting screws. Use what fits your system.

If rack rash is of concern to you, use the included nylon washers when mounting Control Forge in your case.

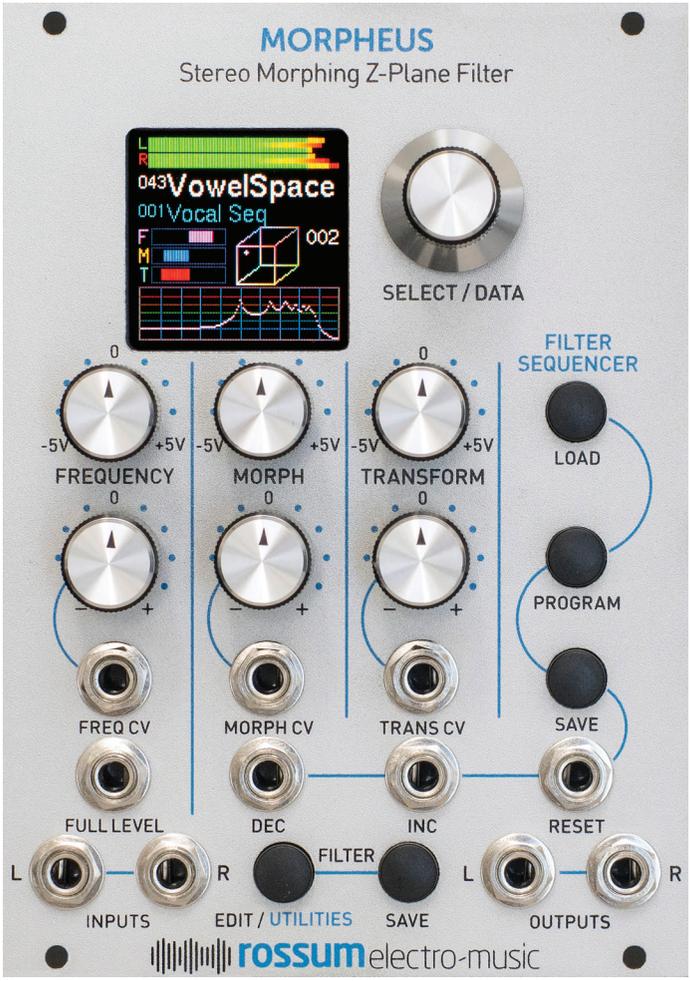
Be Sure You Have the Latest Firmware

If we've released an updated version of firmware or filter cubes after your module was shipped to your dealer, you should update to the latest version(s) before proceeding.

To check:

- > Press and hold the **Edit Filter** button until the **Utilities** screen appears. At the bottom of the screen you'll see the current installed firmware version.
- > To check your cubes version, press and hold the **Edit Filter** button until the **Utilities** screen appears. Scroll down to **Load Cubes** and click the encoder to see the current version. Press **Edit Filter** to return to the **Utilities** menu.
- > On the web, go to the **Downloads** tab at www.rossum-electro.com/products/morpheus/ and note the latest firmware and cubes version.
- > If it's the same as the versions in your module, you're good to go. If not, follow the instructions there to update your module.

3. Overview



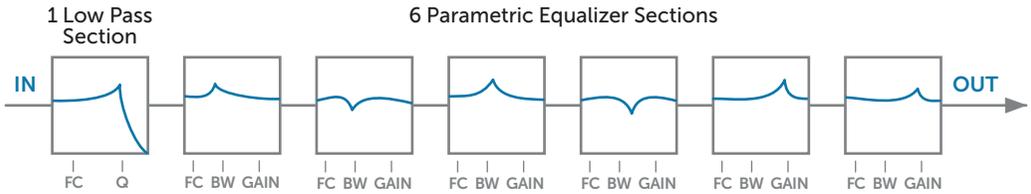


FIGURE 1: A FREQUENCY RESPONSE

What is Morpheus?

Morpheus is a unique digital filter module inspired by the 14th Order Z-Plane Filter Dave originally invented for E-mu's fabled Morpheus synthesizer back in the mid-1990s. The Morpheus filter gives you the ability to create filters of a variety and complexity far beyond the capabilities of conventional synthesizer filters. Most excitingly, Morpheus lets you smoothly interpolate between up to 8 frequency response configurations in real-time, allowing you to explore an entirely new world of expressive, dynamic timbres.

The Morpheus module includes 289 meticulously crafted frequency response combinations, what we call "Cubes."

Each Cube is composed of up to 8 complex frequency response configurations that you can picture as being at the corners of a three dimensional cube (hence the name). Morpheus gives you the ability to smoothly interpolate between those 8 configurations within the cube's three dimensional space.

Due to processor limitations back in the day, the original Morpheus was capable of realtime morphing in one dimension, but interpolation in the frequency and transform dimensions were set at note-on and remained static for the remainder of the note. But even with that limitation, Morpheus offered sonic capabilities that are unmatched to this day.

With the Morpheus filter module, you now have simultaneous real-time CV control of all three dimensions, for dynamic timbral effects unlike anything you've ever heard before. **In stereo.**

Some Details

A **Morpheus Filter** (i.e., what you select and load with the encoder and then use to process your audio) is actually the top level of a three level hierarchy. The three levels are:

A FREQUENCY RESPONSE: This is the most basic construct of a Morpheus filter. It is essentially a single static configuration of Morpheus's 14 poles and zeros. For example, a frequency response might be configured as six independent bands of parametric EQ and a low pass section, as in **Figure 1**, above.

Even this basic building block is capable of creating filtering and resonant spaces of enormous complexity. But the real power comes from the ability to interpolate between multiple Frequency Responses.

A CUBE: A **Cube** provides the structure we need to control the interpolation between multiple **Frequency Responses**.

Let's start with a simple example (actually simpler than any of the actual Cubes). Let's imagine two different Frequency Responses and a single morph parameter to interpolate between them.



FIGURE 2: A SIMPLE MORPH

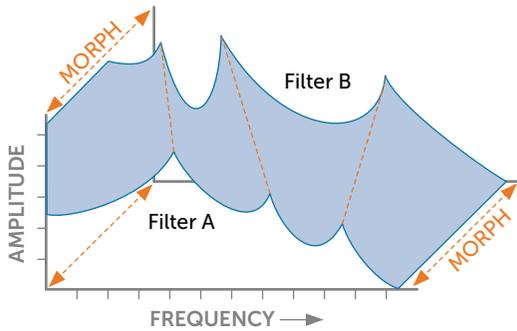


FIGURE 3:
VARYING A SINGLE CV-CONTROLLABLE PARAMETER

By varying that single CV-controllable parameter, you're actually interpolating between 20 different frequency, bandwidth, resonance, and gain parameters simultaneously. We can visualize the result above, in **Figure 3**.

The next step would be to add another pair of Frequency Responses and control them with two parameters. That would look something like this:

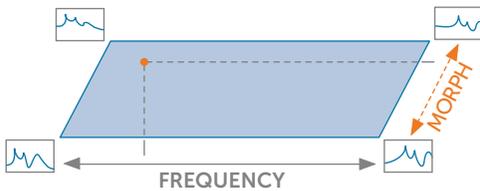


FIGURE 4: ADDING A PAIR OF FREQUENCY RESPONSES

In this case, the two parameters (**Frequency** and **Morph**) define a point on a virtual plane that specifies the interpolation between the four Frequency Responses. In Morpheus, configurations of this type are identified with a ".4" at the end of their Cube name.

Finally, by adding four more Frequency Responses, we have a full **3D Morpheus Cube**, now controlled by three parameters, **Frequency**, **Morph**, and **Transform**.

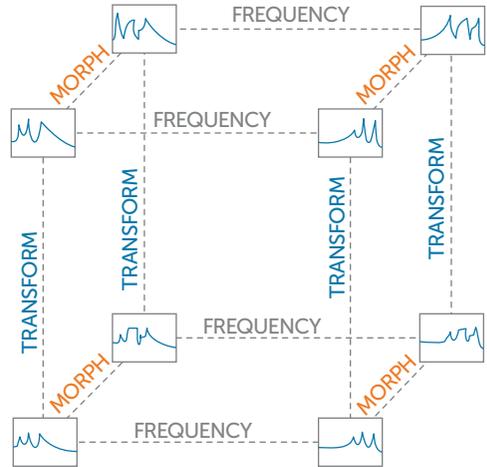


FIGURE 5:
3D MORPHEUS CUBES ARE CONSTRUCTED OF 8 DIFFERENT COMPLEX FILTERS

In this case, you will be interpolating between all 8 component Frequency Responses, controlled by the position of the single interpolation point within the virtual 3D space. For ease of visualization, this is displayed (along with the resulting output frequency response) on Morpheus's graphic display.

A MORPHEUS FILTER: Finally, at the top level of our hierarchy is the fully-configured **Morpheus Filter**. This consists of one of the 289 Cubes and the various parameters set in the **Edit Filter Menu**, described in **Chapter 8**.

A Few Words about Distortion

As described in **Chapter 8**, Morpheus is capable of producing a wide variety of unusual and distinctive types of distortion (depending on the character of individual cubes and the nature of the signals being processed). This is separate from the usually unwanted distortion produced by overdriving the input or by too high a gain through the filter.

All of the **Morpheus Filters** that are based on ".4" Cubes have by default the **Transform** control knob and CV input set to control distortion (since with only 4 Frequency Responses, there is no Transform axis to control anyway). However, even for the full 3D Cubes, you have the option of programming the Transform control and CV to control distortion, in which case the actual Transform value is set as a static value by the **Transform CV Offset** parameter in the **Edit Filter Menu**. Again, see **Chapter 8** for details.

In the following sections, we'll look at each of Morpheus's functions in turn.

4. How to Use This Manual

While, from a processing point of view, Morpheus is insanely complex, from a usability point of view, it's actually pretty straightforward. Basically, pick a filter and modulate it to within an inch of its life. Beyond that, there's creating your own custom filters using the **Edit Filter** menu, stringing filters together in series using the **Filter Sequencer**, and managing the housekeeping functions in the **Utilities Menu**.

With that in mind, the following chapters guide you through the above functions in order.

Chapter 5: Basic Functionality

This chapter introduces you to Morpheus's basic functional principles, including basic operation, inputs and outputs, setting parameters, and loading and saving filters.

Chapter 6: The Main Display

This chapter describes the elements of Morpheus's main operational display.

Chapter 7: Managing Filters

This chapter describes saving and loading your Morpheus filters.

Chapter 8: Editing Filters

This chapter describes editing the various parameters that define a Morpheus filter.

Chapter 9: Filter Sequencer

This chapter covers the functionality of the **Filter Sequencer**, which allows you to program sequences of filters and navigate through the sequences with the encoder or under the control of triggers from other modules in your system.

Chapter 10: Utilities

This chapter describes various utility functions, including loading updated firmware, boot software, or new filter cubes, saving and reloading backups of all your filters and sequences, calibrating your Morpheus, and more.

Chapter 11: Factory Cubes

This chapter describes each of Morpheus's 289 Cubes. To help get you up and running quickly, we've provided preconfigured filters for each of the Cubes.

Chapter 12: Specifications

Yup, specifications.

Chapter 13: From Dave's Lab

Dave describes our unique approach to circuit protection.

Chapter 14: Acknowledgements

Thanks to the talented folks who contributed in one way or another to the development of Morpheus.

5. Basic Functionality

Before we jump into individual functions, let's take a look at Morpheus's basic organization.

Power Up

When power is applied to the module for the first time, it begins with **Filter 001** as the Current Filter and the **Filter Sequencer OFF**.

On subsequent power ups, the Filter and Sequence that were current at power off are restored.

Filters

Filters can be selected and loaded using the **Data Encoder** as described in **Chapter 7** or by the Filter Sequencer as described in **Chapter 9**.

Custom filters can be created and existing filters can be edited using the **Edit Filter** function. Custom and edited filters can be saved using the **Save Filter** function.

Inputs



Audio In Left/Right

Here's where you input the audio to be processed by Morpheus. These are

true stereo inputs, as the channels' separation is preserved through the processing chain to the outputs.

The Inputs expect a signal level up to 20Vp-p.

Morpheus is DC coupled throughout, so, with most cubes, you can use it to process CVs as well as audio.

IMPORTANT: While the left and right channels are completely independent, they are both processed by the same filter (although individual **Gain** and **Distortion** parameters can be selected for each channel). With that limitation, you can, should you desire, choose to input completely different audio into the two channels.



Freq CV

This is a control voltage input that is modified by its associated attenuverter and then summed with the values of the **Frequency** knob and the **Full Level** CV input to produce the final **Frequency** control value.



Full Level

This is an unattenuated CV input that is summed with the values of the **Frequency** knob and the

Freq CV input to produce the final **Frequency** control value.



Morph CV

This is a control voltage input that is modified by its associated attenuverter and then summed with the value of the **Morph** knob to produce the final **Morph** control value.



Trans CV

This is a control voltage input that is modified by its associated attenuverter and then summed with the value of the **Transform** knob to produce the final **Transform**, or optionally, the final **Distortion** control value.

NOTE: The function of this CV input (along with the **Transform** knob) for each filter is set in the **Edit Filter Menu**. If **Transform Controls Distortion** is selected for a particular filter, then **Transform** is set to a static value and the knob and CV controls the amount of distortion produced by the current filter.

Sequencer Dec, Inc, and Reset



Depending on the **Filter Sequencer** state, rising edges at these inputs control the loading of a sequence's programmed filters or navigation commands. These inputs accept digital signals with a threshold voltage of 1.65V. See **Chapter 9** for details.

Outputs



Audio Out Left/Right

Here's where the processed sound comes out.

Depending on the input levels, the settings of the various parameters, and the function of the selected filter, the outputs provide signal levels of up to 20Vp-p without clipping.

Controls



Data Encoder

The Encoder is used to select and load Filters and Sequences as well as set the value of various parameters.

The Encoder includes an integrated pushbutton that is typically used to load the currently selected Filter or Sequence or to enter a currently selected parameter value (see individual parameters for details).

Frequency, Morph, and Transform Knobs



Each of these knobs lets you manually set a control voltage for its respective axis. The selected values are summed with their respective CV inputs to provide the final value for its axis.

Their range, as indicated on the panel, is from -5V to +5V. If no offset is set for an axis, its knob can potentially place the interpolation point at any location on the axis.

NOTE: A knob's actual range of placement will be modified by any programmed offset of its axis as well as any current control voltage.

Adjustment of these knobs (as well as any CVs present) is indicated in real time on the display by both the graphical **CV indicators** and the position of the interpolation point in the **3D Cube** graphic.

Frequency, Morph, and Transform Attenuverters



These controls modify any CVs present at their respective inputs.

When an attenuverter knob is set to its "0" position, no control voltage at its input is passed to its associated axis.

As the knob is turned clockwise from 0, the amplitude of the control voltage increases until, at maximum clockwise rotation, the full amplitude of the signal at the input is passed through.

As the knob is turned counter-clockwise from 0, the signal at the CV Input is inverted (e.g., a CV of +2.5V becomes -2.5V). The farther counterclockwise the knob is turned, the less the attenuation of the inverted signal, until, at maximum counter-clockwise rotation, the full amplitude of the inverse of the signal at the input is passed through.



Edit Filter/Utilities Button

Pressing this button gives you access to the parameters that allow you to create your own custom filters. Details are in **Chapter 8**.

Pressing and holding this button brings up the **Utilities Menu**, where you will have access to Morpheus's various housekeeping and maintenance functions. See **Chapter 10** for details.



Save Filter Button

Pressing this button allows you to save new custom filters or filter edits. Details are in **Chapter 7**.



Load Sequence Button

Pressing this button allows you to select a previously saved Filter Sequence or to turn the sequencer on or off. Details are in **Chapter 9**.



Program Sequence Button

Pressing this button allows you to program or edit the steps of a Filter Sequence. Details are in **Chapter 9**.



Save Sequence Button

Pressing this button allows you to save new sequences or sequence edits. Details are in **Chapter 9**.

Setting Parameters

Apart from the axis CVs set by the front panel knobs, parameters are set by accessing the appropriate menu (**Edit Filter**, **Program Sequence**, or **Utilities**), using the encoder to select the desired parameter, pressing the encoder switch to display the parameter's current value, using the Encoder to set the desired value, and then pressing the encoder switch again to accept the new value.

IMPORTANT NOTE: *Whenever there are any unsaved parameter changes in a filter or sequence, a red warning (F for Filter and S for Sequence) will appear in main display. If you select a new filter or sequence before saving them, the changes will be lost.*

6. Main Display

Morpheus's main display provides a variety of information that gives you a comprehensive view of what's happening in the module. Additionally, there are dedicated displays for **loading** and **saving** filters and sequences, **programming** and **editing** filters and sequences, and executing **utility** functions.



In this chapter, we'll describe the main display. The rest will be described in their own chapters.

IMPORTANT: *OLED displays (which is what the Morpheus display is) have long lifetimes under normal use, but if you leave your system on 24/7 (or just want to ensure the longest possible life for your display), Morpheus provides the ability to adjust the brightness of the display (which is also useful for optimizing it for the ambient lighting level of your work environment) and, optionally, to set a time after which the display enters a screensaver mode. Both of these can help extend the life of your display. They are set in the Utilities menu. Details for setting them will be found in **Chapter 10**.*

The main display provides the following:

The left and right VU and Distortion Meters.

For each of the two audio channels:

- > The top horizontal bar indicates the channel's input level. As the level increases towards the right, the color of the bar transitions from green to yellow to red, so you can see at a glance how close to clipping the signal is. If you are seeing this

meter extend into the red, you will need to lower the level of the input signal before it reaches the filter, by either adjusting the level at the signal source or patching it through an attenuator, VCA, or mixer.

- > The middle horizontal bar indicates the amount of distortion that results from the distortion settings in the Edit Filter menu. Red indicates distortion. See **Chapter 8** for details.
- > The bottom horizontal bar indicates the output level through the filter. If you are seeing this gain meter extend into the red, you may wish to adjust the Left or Right Gain settings in the Edit Filter menu to reduce or eliminate clipping distortion. See **Chapter 8** for details.

The number and name of the currently loaded filter.

The number and name of the currently loaded sequence. If the Sequencer has been turned off, the display, rather predictably, is "Sequencer Off."

Three horizontal graphical indicators of the real-time values of the Frequency (F), Morph (M), and Transform or Distortion (T or D) inputs to the filter. If a filter is set to control the Transform axis, the bottom indicator is labeled "T." If a filter is set to **Transform Controls Distortion**, the indicator is labeled "D."

NOTE: *The graphic indicators display the values that are the sum of the manual settings of the **Frequency**, **Morph**, and **Transform** knobs and any CVs appearing at their associated inputs.*

ANOTHER NOTE: *These graphical CV indicators always show the cumulative CVs before any scaling. The 3D Cube Graphic will show the resulting position of the interpolation point after all scaling.*

A **Cube Graphic** that illustrates the 3D parameter space of the currently selected filter cube. A colored cross within the cube indicates the real-time position of the interpolation point as defined by the values of the three individual parameter axes.



A Sequencer Status indicator

which displays the current sequence step number

(if the step contains a filter) or an indication that the sequence is in a **Halt (-H-)** or **Pause (-P-)** state. Anytime that Morpheus receives a rising edge at the Sequencer **Dec, Inc,** or **Reset** inputs, the display briefly flashes a yellow indicator showing which input was activated.

The current fade time scale factor. This only appears if the Sequencer is On, and the sequence has advanced to a step that contains a Fade Time Scale command.

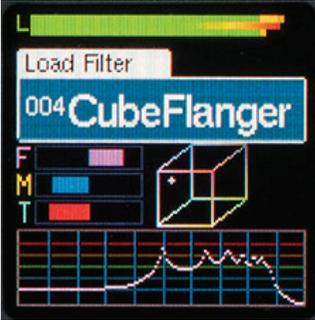
 **NOTE:** If **Sequence Off** has been selected, the sequence status displays described above are blank.

Red indicators that light when the current filter (F) and/or the current sequence (S) have unsaved changes.

A real-time animated plot of the current frequency response of the filter. The horizontal axis is frequency, with lines every octave starting at 20Hz. The vertical axis is amplitude, with lines every 10dB from -30dB to +30dB.

7. Managing Filters

Loading Filters

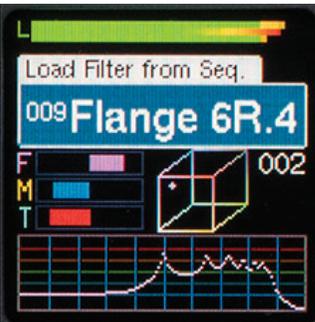


When the **Filter Sequencer** is Off, turning the encoder will bring up the **Load Filter** box and scroll through all existing filters. When you see the one

you want, click the encoder's switch. The selected filter will be loaded, respecting the **Exit Fade Time** of the previously loaded filter and the **Enter Fade Time** of the newly selected filter.

If you change your mind before clicking, scroll back to the currently loaded filter. You'll see the **Load Filter** box disappear.

If you **press and hold** the encoder switch and then turn the encoder, each filter will load immediately as it appears in the **Load Filter** box (still respecting the fade out and fade in times).



When the **Filter Sequencer** is **On**, turning the encoder will only display and select filters in the currently loaded sequence. The encoder will skip over

Sequence commands (Pause, Halt, Bumper, etc) with no effect.

TIP: This is not only useful for manually controlling Filter Sequences, but also lets you use the sequencer to create sub-sets of filters for easy access in specific situations. For example, if you're participating in a live performance with four different pieces, you can create a separate sequence for each of the pieces and program each one with only the filters you use in that piece. That way, during each piece, you'll have quick access to the filters you'll need, without having to scroll past lots of filters that you don't need.

NOTE: As shipped from the factory, Morpheus contains a series of sequences that subdivide the filters by basic function. Loading one of those sequences allows you to select among only that filter type.

Saving Filters



Press the **Save Filter** button to bring up the **Save Filter** display. The current filter is initially displayed.

Selecting a Location

When first entering this screen, the encoder controls the **Filter Number** field. Scroll through the numbers to select a destination location (or don't scroll to resave to the current filter's existing location). Note that this scrolling does include **--empty--** filter locations. At the top of the scrolling list is a special item, ****ERASE****.

Saving Without Changing the Name

To save the current filter to the selected location without changing the location's existing name, either press the encoder for 2 seconds, or press the **Save Filter** button for 2 seconds. The display briefly displays "**Saving in 2 Seconds...**" and then (after 2 seconds) displays "**Save Completed**" and exits the Save Filter screen.

If you release the button before 2 seconds have elapsed, the display briefly shows "**Save canceled**" and exits the screen without executing the save operation.

 **NOTE:** The **Save Filter** operation can also be exited at any time without saving by pressing any other function buttons.

Changing the Filter Name

To change the name of the selected target location, press the encoder. A cursor will highlight the first character in the **Name** field. (If the selected location was **--empty--**, the Name field will change to the name of the current filter.)

The name is changed using the encoder as follows:

1. After a highlighted character has been selected using the encoder, press the encoder to select that character for changes.
2. Rotate the encoder to select the new character.
3. Press the encoder to choose the character and return the encoder to character location selection operation.
4. Repeat as necessary.

Saving After a Name Change

To save the renamed filter to the selected location, either long press the encoder, or long press the **Save Filter** button. This can be done while either in the character location selection or character changing operation for the encoder. The display briefly displays "**Saving in 2 Seconds...**" and then (after 2 seconds) displays "**Save Completed**" and

exits the Save Filter screen. If you release the button before 2 seconds have elapsed, the display briefly shows "**Save canceled**" and exits the screen without executing the save operation.

Erasing the Current Filter



To erase a filter, press **Save Filter** and then scroll to the beginning of the menu to display **### **ERASE**** (where **###** is the filter number of the current

filter which will be erased). While ****ERASE**** is displayed, either long press the **Encoder**, or long press the **Save Filter** button. The display will briefly display **Erasing Filter** and then exit the screen. If you release the button while **Erasing Filter** is displayed, the display briefly shows **Erase canceled** and exits the screen without executing the erase operation.

 **NOTE:** Erasing a filter that is a member of a Sequence will change the name of that filter to **--erased--** in the sequence step list and will replace it with a filter with **Null Filter** values.

 **ANOTHER NOTE:** If you, for some bizarre reason, erase all of the filters in your module, the next time the module boots up, the module will contain **Filter 001** named **--erased--** and set to **Null Filter** values.

8. Editing Filters



The **Edit Filter** menu is where you can create your own custom filters by selecting from among Morpheus's **289 Cubes** and setting your desired filter parameters.

To access the **Edit Filter** menu, press the **Edit** button.

Here are the available parameters:



Select Cube

If you are creating a new filter from scratch, here is where you will select which of Morpheus's 289 Cubes the filter will use. If you

are only editing the parameters of an existing filter (gains, offsets, etc.), you'll typically leave this alone.

NOTE: A special case is **Cube 000**, the **Null Cube**. The **Null Cube** provides no processing, so you can think of it as a bypass of sorts. One reason to program a filter with the **Null Cube** is to use it in **Filter Sequences** for any steps where you want your audio to temporarily pass though unfiltered.



Frequency, Morph, and Transform CV Offsets

The Frequency, Morph, and Transform CV Offsets let you define the interpolation

point on each respective axis that results from a cumulative CV of 0V (i.e., manual knob + CV input(s)) for that axis.

Their range is from **-5.0V to +5.0V**. The default value for all axes is **0.0V**.

To set parameters:

1. Turn the encoder to scroll through the available parameter list.
2. Click the encoder to choose the desired parameter.
3. Turn the encoder to set your desired value.
4. Click the encoder to return the parameter list.

The menu is dismissed by pressing the **Edit Filter** button again.

THE DETAILS: With a CV Offset of 0.0V (i.e., no offset), a cumulative CV of 0V results in the interpolation point being in the exact center of its axis. In this case, a CV of +5.0V will place the point at one extreme end of the axis, while a CV of -5.0V will place it at the opposite extreme.

But if, for example, you set an offset of +2.0V, when you have a CV of 0V, the interpolation point will be 2/5 of the way from the center of the axis towards one end of the axis. In this case, it only takes a CV of +3.0V to move the point to the extreme end.

A CV of -2.0V will place the point exactly in the center of the axis, and it will take -7.0V to move the point to the opposite end of the axis.

 **NOTE:** *With no CV Offset, the Frequency, Morph, and Transform knobs can place the interpolation points for their axes anywhere within the 3D Cube space without the need for any additional CV. However, when any CV Offset is programmed, the knobs can no longer cover the entire range by themselves (unless you increase the CV gain). In that case, additional CV input is required to cover the entire range.*

 **ANOTHER NOTE:** *The interpolation point can never extend beyond the edge of the 3D Cube space. In the example above, once a CV of 3.0V has moved the point to the extreme end of its axis, any additional CV over 3.0V will have no effect.*

 **YET ANOTHER NOTE:** *When **Transform Controls Distortion** is selected for a particular filter, The **Transform CV Offset** parameter defines the static position of the Transform axis.*



Frequency, Morph, and Transform/ Distortion CV Gains

The Frequency, Morph, and Transform/
Distortion
Gain settings
let you scale

the cumulative CV (i.e., manual knob + CV input(s)) for each axis.

Their range is from **-9.9x to +9.9x**. Hence, 1V can span from 1% to 100% of an axis. The default value for all axes is **1.0x** (i.e., no scaling).

Values greater than one result in an increase of the cumulative CV.

Values between .99x and .01x result in a decrease of the cumulative CV.

Values of less than 0 both **scale and invert** the CV. For example, with a CV Gain value of -2.0X and a cumulative CV of +1.5V, the resulting CV would be -3.0V.

 **NOTE:** *When **Transform Controls Distortion** is ON, the **Transform CV Gain** parameter changes its name to **Distortion CV Gain**.*

 **IMPORTANT NOTE:** *The graphical CV indicators always show the cumulative CVs **before** any scaling. The 3D Cube graphic will show the resulting position of the interpolation point **after** all scaling.*



Enter Fade Time and Exit Fade Time

When transitioning from one filter to another, either manually by using the encoder or

via the Filter Sequencer, you can program independent **Enter Fade Times** and **Exit Fade Times** for each filter. The total transition time for any filter change will be the sum of the **Exit Fade Time** for the outgoing filter plus the **Enter Fade Time** for the new filter.

NOTE: *The Fade Times programmed here can be scaled up or down (i.e., to be faster or slower) when a filter appears in the **Filter Sequencer**. See **Chapter 9** for details.*



Left and Right Gain

These parameters let you set the gain from input to output of each filter channel (Left or Right). The resulting

output gains are displayed on their respective channel output meters on the main display. If you see the output meters in the red (and you don't like the resulting sound), you can reduce the gain here to bring the levels down below clipping.

Their range is **-40dB to +40db** in 1dB intervals. The default value for both channels is **0dB**.

NOTE: *These parameters only affect the gain through the filter. If you are seeing the **input** gain meters extend into the red, you will need to lower the level of the input signal before it reaches the filter, by either adjusting the level at the signal source or patching it through an attenuator, VCA, or mixer.*



Left and Right Distortion

Morpheus is capable of producing a wide variety of unusual and distinctive types of distortion (depending

on the character of individual cubes and the nature of the signals being processed). These parameters set the amount of internal filter distortion for each channel (Left or Right). The range is from **-30dB to +70dB**.

The resulting amounts of distortion for each channel are displayed on their respective distortion meters on the main display (red indicates distortion). However, the most productive way of adjusting these parameters is by ear, i.e., just vary the values until you get the sound you want.

NOTE: *If **Transform Controls Distortion** is **OFF**, these parameters set the static amounts of filter distortion. If **Transform Controls Distortion** is **ON**, these controls set the amounts of distortion with no CVs present. CVs from the **Transform Knob** or **Transform CV Input** will further modify the distortion amount from that initial setting.*

ANOTHER NOTE: *It's important to remember that the filter distortion set by these parameters is intended to be a creative tool and is separate from the distortion that results from a too hot input to the filter or the distortion resulting from too high a setting of the **Left and Right Gain** parameters described above. Those are the kinds of distortion you typically don't want (although maybe you do — it's always your choice).*

YET ANOTHER NOTE: *Changing the Left and Right Gain will not affect the amount of internal distortion, only the output level.*



Transform Controls Distortion

The Transform Controls Distortion function lets you choose whether the Transform control, CV

input, and Gain setting affect the Transform axis interpolation point or the amount of filter distortion.

When this parameter is **OFF**:

- > The **Transform Knob** and the **Transform CV Input**, in combination with the **Transform Gain and CV Offset**, control the interpolation point on the Transform Axis.
- > The **Left and Right Distortion** parameters set the static amount of distortion for their respective channels.

When this parameter is **ON**:

- > The **Left and Right Distortion** parameters set the initial amount of distortion for their respective channels.
- > The **Transform Knob** and the **Transform CV Input**, in combination with the **Distortion Gain** parameter provide real-time control of the amount of distortion.

> The **Transform CV Offset** sets the static position of the interpolation point on the Transform Axis.

NOTE: *When **Transform Controls Distortion** is **ON**, the **Transform CV Gain** parameter in the **Edit Filter** menu changes its name to **Distortion CV Gain**.*

ANOTHER NOTE: *By default, all factory filters that end in ".4" are set to **Transform Controls Distortion**. Since these filters consist of only 4 frequency configurations, controlling the Transform axis generally has a less interesting effect.*

9. Filter Sequencer

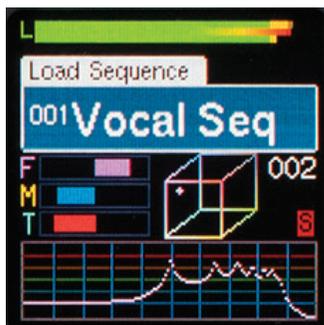
The **Filter Sequencer** allows you to create an ordered list of filters (and optionally, some navigational commands and commands that scale the individual filters' fade in and fade out times) and then step through them under trigger control or manually via the encoder.

Sequence Structure

A **Filter Sequence** is made up of a list of steps containing one or more filters, and, optionally, one or more commands that affect the progress of the sequence or the filters' fade in and fade out times.

Sequences are numbered from 000 to 200. Sequence 000 is the special case "Off." Sequences 001-200 each have a name of up to 12 characters. The default name of a sequence location that has never been saved to is "--empty--".

The progress of the **Filter Sequencer** is controlled by triggers at the **Dec, Inc,** and **Reset** input jacks, as described below, as well as by the **data encoder**.



Load Sequence

Press the **Load Sequence** button to bring up the **Load Sequence** box. Use the encoder to scroll through

all of the existing sequences, displaying the number and name of each one. Empty or erased sequences are not displayed.

Press the encoder switch to select the desired sequence and load it into Morpheus and exit the Load Sequence screen.

NOTE: A long press of the **Load Sequence** button will also load the sequence displayed in the **Load Sequence** box. This makes reloading the current sequence to easily and deliberately erase unwanted edits simply a matter of pressing **Load Sequence**, and then immediately long pressing it.

Sequence 000 (Off) turns off the sequencer. When Sequence 000 is loaded, triggers at the sequence control jacks are ignored.

When loaded, a sequence (other than Sequencer Off) begins at Step 001 and immediately loads the associated filter for that step.

NOTE: In addition to turning the sequencer off by selecting Sequence 000, pressing and briefly holding the **Load Sequence** button will toggle the sequencer on and off without having to bring up the **Load Sequence** box.



Program Sequence

Pressing the **Program Sequence** button brings up the **Program Sequence** screen and allows the selection or

editing of the filters and commands of the currently active sequence.

While in the **Program Sequence** screen, the display will show up to seven sequence steps (fewer if the sequence contains less than seven steps) and their current content.

To program or edit a step, use the encoder to scroll to that step (it will be displayed at a larger size than the unselected steps) and

press the encoder. The current content of the step will be highlighted in red and turning the encoder will select the desired content or action for that step.

Possible step contents include:

- > Any existing **filter**
- > A navigational **command**:
 - Pause**
 - Halt**
 - Bumper**
- > A **Fade Time Scale** command

These commands will be described below. In addition, once a step is selected, you can perform the following **Actions**:

Insert Step: A new step containing a **Pause** is created and inserted at the current step number. It becomes the current step and is selected for editing.

Delete Step: The current step of the sequence is deleted, and you are returned to the **Program Sequence** screen.

Pressing the encoder while an action is highlighted executes that action. Pressing the encoder while a command or filter is highlighted replaces the current step contents with that command or filter.

Adding Steps to a Sequence

To add one or more steps to your sequence, scroll to end of the step list until **Add a Step** is highlighted. Press the encoder to add a step to the end of the sequence. Repeat as needed.

Sequence Commands

 **NOTE:** The commands described below affect the flow of a sequence when it is being clocked by triggers at the **Inc**, **Dec**, or **Reset** jacks. When navigating through a sequence using the **Data Encoder**, the **Navigation Commands** are ignored. I.e., you can use the encoder to directly load any filter in the sequence, regardless of surrounding nav commands.

Navigational Commands

The **Navigational Commands** give you some additional ways to control the flow of your sequences. Here's how they work:

When a new sequence is loaded, it begins at **Step 001**. Subsequently, any **Reset** rising edge acts to jump to **Step 001** and load the filter or command associated with it, and any **Inc** or **Dec** rising edge will cause the sequence to move (circularly) to the next or previous step. If that step is a filter, it will be immediately loaded; if that step is a command, it will take effect per the descriptions below:

Halt: When a **Halt Command** is loaded, the sequencer enters the **Sequence Halt** state. In this state, subsequent **Inc** or **Dec** rising edges are ignored. Only a **Reset** rising edge (or the loading of a new sequence) will return the Sequencer to the normal state. A **Reset** rising edge also acts to jump to **Step 001**.

Pause: When a **Pause Command** is loaded, the sequencer enters the **Sequence Pause** state. In this state, subsequent **Inc** or **Dec** rising edges are ignored until receipt of a **Reset** rising edge, which will return it to the normal state. At that point, the **Pause** has been satisfied, and subsequent **Inc** or **Dec** signals act normally, and any **Reset** rising edge acts to jump to **Step 001**.

Bumper: When the sequencer is adjacent to a step containing a **Bumper Command**, the sequencer remains in a normal state, but ignores any **Inc** or **Dec** signals that would advance it to the **Bumper** step. Essentially, the sequence sticks at the step adjacent to the **Bumper** step until an **Inc** or **Dec** rising edge moves it away from the **Bumper** step, or until a **Reset** rising edge returns it to **Step 001**.

 **NOTE:** Since sequences can progress circularly, it's possible to encounter **commands** from either side.



Fade Time Scale Commands

The **Fade Time Scale** commands let you scale all of the subsequent filter transition times from 1/32 to 8x

the values set in the individual filters. For example, if the filters in your sequence all have the default fade in and fade out times of .25 second, you can program them to have fade in and out times of from .008 second to 2 seconds.

NOTE: Whenever a time scaling is in effect, the scaling factor is displayed in the Main Display, directly under the sequence step number.



A TIP: Multiple **Fade Time Scale** commands can be present in a sequence, each changing the scaling as they are encountered, so you can change the fade time as often as you like within a single sequence.

Reset, Dec, and Inc Inputs

If the Sequencer is **Off**, these inputs are ignored. If the Sequencer is on (i.e., any sequence except #000 is loaded), each of these inputs responds to a rising edge as follows:

Reset: If the Sequencer is in the **normal** or **Halt** state, it immediately jumps to **Step 001** of the current sequence, loading the associated filter or command.

If the sequence is in the **Pause** state, the sequencer will exit that state and return to the normal state, taking no other action until it receives another **Dec, Inc** or **Reset**.

Inc: If the sequencer is in the normal state, it immediately attempts to advance to the next higher (circular) step. If that step is a **Bumper**, it does not advance, but stays at the current step. Otherwise, it succeeds in advancing to the next step. If that step is a **Halt** or **Pause** Command, it enters the corresponding state. If that step is a valid filter, that filter is immediately loaded. If that step is an **Empty Filter***, a **Null Filter** will be loaded.

If the sequence is in the **Pause** or **Halt** state, the sequencer will take no action.

Dec: If the sequencer is in the normal state, it immediately attempts to decrement to the next lower (circular) step. If that step is a **Bumper**, it does not decrement, but stays at the current step. Otherwise, it succeeds in decrementing to the previous step. If that step is a **Halt** or **Pause** Command, it enters the corresponding state. If that step is a valid filter, that filter is immediately loaded. If that step is an **Empty Filter***, a **Null Filter** will be loaded.

If the Sequence is in the **Pause** or **Halt** state, the sequencer will take no action.

While it is not possible to program an empty filter into a sequence, it would be possible to program an existing filter into a sequence and subsequently erase that filter. In that case, the sequence step the erased filter previously occupied would be named "-- empty--" and would contain the **Null Filter (i.e., a filter that passes the audio with no processing). If you find yourself in that situation, it'd probably be wise to delete that step or assign an actual exiting filter to that step.*

Other Stuff to Know About Sequences

- > In addition to being off because you've selected **Sequence OFF**, the sequencer is also off when you are in the **Edit Filter** menu (so it won't be changing filters on you while you're trying to program one) and while a filter is being saved. If the sequencer is Off due to editing or saving a filter, once those modes are exited, the sequencer will resume its previous state.
- > Logically, all sequences loop at their end. Any step can be any entry (i.e., any **filter** or **command**) with the recognition that some entries or combinations make little functional sense or can even create completely dysfunctional sequences. Specifically, placing a **Halt** at **Step 001** will result in a sequence that can never progress beyond Step 001 (except through the use of the encoder).
- > Special case: A **Bumper** placed at **Step 001** acts as a (satisfied) **Pause** (i.e., an **Inc** or **Dec** will move to adjacent steps).



Save Sequence

Saving Sequences (including naming them) functions exactly like saving Filters as described in **Chapter 7**. Rather than

duplicate all that here, refer to that chapter and, in your mind, replace "Filter" with "Sequence."

10. Utilities



The **Utilities** menu is where you'll find Morpheus's various housekeeping and maintenance functions.

To access the **Utilities** menu, press and hold the **Edit Filter** button. Turn the encoder to scroll through the available function list. Click the encoder to choose the desired function.



The menu is dismissed by pressing the **Edit Filter** button again.

While in any **Utility** function, filtering is disabled; no signal passes from the audio inputs to the audio outputs. When a Utility function is exited, Morpheus resumes passing signal with the previously loaded filter. During any Utility function, sequencer inputs are ignored.

Here are the available **Utility** functions:



Save User Data
This function lets you save all your filters and sequences to an audio .wav file for backup or transfer purposes.

To save your data to a .wav file:

1. Connect Morpheus's **Left Output** to the input of your recording device.
NOTE: *The recording device must record uncompressed WAV data. Do not use an MP3 recorder.*
2. Select **Utilities > Save User Data** on your Morpheus.



3. Upon selecting Save User Data, Morpheus will begin sending a test tone for the purpose of setting your record level. Using this tone, set the record level on your recording device to about -6dBFS.
4. Start recording on your recording device.
5. Click the encoder on your Morpheus to send the data.



Once transfer is complete, stop recording on your recording device and click the encoder to return to the **Utility** menu.



To load your saved data:

1. Connect the output from your playback device to your Morpheus's **Full Level Frequency** input. We've found that a regular Eurorack patch cord works fine. (See the **Hints for Playing Back WAV Files** section below for hints for successfully playing the files into your Morpheus.) Set the Frequency Knob to its center position (0V).

 **IMPORTANT!** *Make sure there is no input into the attenuverted **Freq CV Input** (not even a patch cord).*

2. Select **Utilities > Load User Data** on your Morpheus.
3. Click the encoder as instructed.
4. Start playback of the .wav file. You should see a progress indicator in the display.



5. If an error is detected during reception or on completion of reception, an error message will be displayed and you can try again or press the **Edit Filter** button to exit.



Load User Data

This function let's you play a previously recorded (using the **Save User Data** function) backup into your Morpheus to load that data into your module's memory.

 **IMPORTANT!** *This function will also overwrite (i.e., delete) all of the filters and sequences in your module. So **be careful**. We highly recommend using the **Verify User Data** function described below to confirm that your file is good before actually loading it.*

 **NOTE:** *If you are accessing the .wav file from the internet (as opposed to having recorded it yourself), perhaps because you are loading filters that someone else developed and shared online, see the **Hints for Playing Back WAV Files** section below for advice on successful playback.*



Once transfer is complete, click the encoder to return to the **Utility** menu.



Verify User Data

This function lets you play a previously recorded backup (using the **Save User Data** function) into your Morpheus to

ensure that it is intact and being played back at sufficient level.

This does **not** actually load the data into your Morpheus. Its purpose is to confirm that the backup file is valid, so that you can avoid loading an invalid file and deleting your existing data.

 **NOTE:** *If you are accessing the .wav file from the internet (as opposed to having recorded it yourself), perhaps because you are loading filters that someone else developed and shared online, see the **Hints for Playing Back WAV Files** section below for advice on successful playback.*

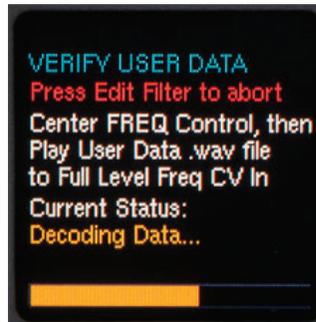
To verify your saved data:

1. Connect the output from your playback device to your Morpheus's **Full Level Frequency** input. We've found that a regular Eurorack patch cord works fine. (See the **Hints for Playing Back WAV Files** section below for hints for successfully playing the files into your Morpheus.)

Set the Frequency Knob to its center position (0V).

 **IMPORTANT:** *Make sure there is no input into the attenuverted **Freq CV Input** (not even a patch cord)*

2. Select **Utilities > Verify User Data** on your Morpheus.
3. Click the encoder as instructed.
4. Start playback of the .wav file. You should see a progress indicator in the display.



5. If an error is detected during reception or on completion of reception, an error message will be displayed and you can try again (try playing back at a hotter level) or press the **Edit Filter** button to exit.
6. If you don't receive an error, you can proceed to load the data into your Morpheus using the **Load User Data** function described above.

Once the process is complete, click the encoder to return to the **Utility** menu.



Merge User Data

This function lets you read in a data file (filters and sequences) and copy any filter or sequence in that file

to your module, as long as its number is not already taken up with a saved filter or sequence already in your module.

So, if you have saved filters 303 and 306, and you load in a file that has filters 301–309, you'll end up with the following:

301 and 302 from the merge file

303: your existing filter

304 and 305 from the merge file

006: your existing filter

007, 008, and 009 from the merge file

 **NOTE:** *303 and 306 from the merge file will not be transferred.*

Sequences work the same, with the exception that it would be possible to exceed the 20,000 step limit. In that case, any sequences that exceeded the limit would not be transferred.

To merge your saved data:

1. Connect the output from your playback device to your Morpheus's **Full Level Frequency** input. We've found that a regular Eurorack patch cord works fine. (See the **Hints for Playing Back WAV Files** section below for hints for successfully playing the files into your Morpheus.)

Set the Frequency Knob to its center position (0V).

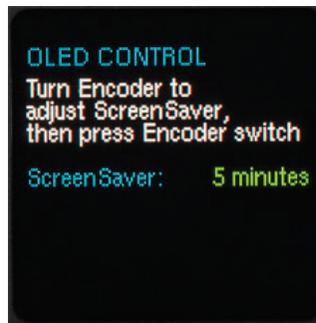
-  **IMPORTANT:** *Make sure there is no input into the attenuverted **Freq CV Input** (not even a patch cord).*
2. Select **Utilities > Merge User Data** on your Morpheus.
3. Click the encoder as instructed.

4. Start playback of the .wav file. You should see a progress indicator in the display.



5. If an error is detected during reception or on completion of reception, an error message will be displayed and you can try again (try playing back at a hotter level) or press the **Edit Filter** button to exit.

Once the process is complete, click the encoder to return to the **Utility** menu.



OLED Control

As mentioned back in **Chapter 6**, OLED displays have long lifetimes under normal use, but if you leave your system

on 24/7 (or just want to ensure the longest possible life for our display), you can adjust the brightness of the display (which is also useful for optimizing it for the ambient lighting level of your work environment) and, optionally, you can set a time after which the display enters a screensaver mode. Both of these can help extend the life of your display.

 **NOTE:** *Once the screen saver has appeared, any button press or a turn of the encoder will dismiss it and return to the regular display. Such encoder turns or button presses are not registered as control inputs.*

ANOTHER NOTE: The screen saver will not appear when you are executing a Utilities Menu function. However, it will appear if the Utilities Menu is displayed (but no function selected).

Here's how it works:

1. Select **Utilities > OLED Control** on your Morpheus.
2. Turn the encoder to select a brightness level of 1-11. You'll see the display change in brightness as you scroll through the values. The value number also changes color to indicate their effect on OLED life (Green=great, Yellow=okay, Red=beware if you leave your system on 24/7)
3. Click the encoder to move to the **ScreenSaver** setting.
4. Turn the encoder to select the time after which the screen saver will appear. Choices range from 2 minutes to 60 minutes and "Never." If you consistently leave your system on long periods of time, "Never" is probably not a good choice.

NOTE: The screen saver is a small version of Morpheus's frequency plot that moves randomly around the display. Note that this plot is actually functional, responding in real-time to manual adjustments and CV inputs.

Calibrate



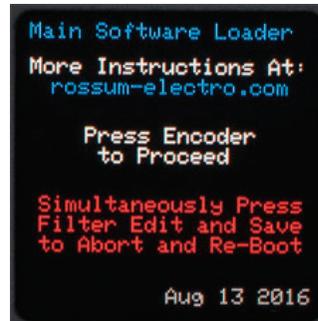
Your Morpheus is carefully calibrated at the factory. So, in normal circumstances, you shouldn't have a need to recalibrate it.

However, if your cabinet runs particularly hot or cold, or for various other reasons, you might wish to re-calibrate.

NOTE: You can tell if your module would benefit from recalibrating by bringing up #289 Null Filter (most, but not all filters will also do), leaving both Left and Right Input jacks unconnected, and checking the INPUT VU level. If more than one green bar shows, you might want to recalibrate. Fortunately, it's really easy."

Select **Utilities > Calibrate** on your Morpheus. The procedure is self-guiding. Simply follow the instructions on each screen.

When the encoder is pressed after the last step, the screen will briefly display "**New Calibration Data Saved**" then return to normal operation.



Load Software

This function lets you load updated operating software into your Morpheus. The process is pretty much identical to

the **Load User Data** process described above.

1. Connect the output from your playback device to your Morpheus's **Full Level Frequency** input.
2. Select **Utilities > Load Software** on your Morpheus.
3. Click the encoder as instructed.
4. Start playback of the .wav file. You should see a green percentage progress message in the display (see below). Again, see the **Hints for Playing Back WAV Files** section below if you're having any problems.

```
Main Software Loader
More Instructions At:
  rossum-electro.com
Play Morpheus Program
.wav File into FULL
LEVEL FREQ CV Input
Current Status:
Decoding Data - 05%
Errors:
None
```

```
Main Software Loader
More Instructions At:
  rossum-electro.com
Play Morpheus Program
.wav File into FULL
LEVEL FREQ CV Input
Current Status:
New Software Loaded
Press Encoder
to Proceed
```

- 5. If an error is detected during reception or on completion of reception, an error message will be displayed and you can try again or press the **Global/Pause/Utilities** button to exit.

Once transfer is complete, click the encoder to reboot your Morpheus and use your new software.

```
LOAD BOOT2 SOFTWARE
Press Edit Filter to abort
More Instructions at:
  www.rossum-electro.com
Press encoder to proceed
```

Load Boot Software

This function loads an updated version of the special software that's responsible for booting up your Morpheus.

```
LOAD BOOT2 SOFTWARE
Press Edit Filter to abort
Center FREQ Control, then
Play Morpheus Boot2 .wav
file to Full Level Freq CV In
Current Status:
Awaiting Audio...
VU █
```

Morpheus and load an appropriate Boot Software file.

```
LOAD CUBE DATA
Press Edit Filter to abort
More Instructions at:
  www.rossum-electro.com
Press encoder to proceed
Current Cube Revision:
Beta1611181000
```

The process is identical to the **Load Software** function above, except, of course, that you select **Utilities > Load Boot Software** on your

Load Cubes

This function loads an updated version of Morpheus's preconfigured filter cubes.

The process is also identical to the **Load Software** function above, except that this time, you select **Utilities > Load Cubes** on your Morpheus and load an appropriate Cubes file.

```
LOAD CUBE DATA
Press Edit Filter to abort
Center FREQ Control, then
Play Morpheus Cube .wav
file to Full Level Freq CV In
Current Status:
Awaiting Audio...
VU █
```

Manufacturing Test



This function provides a suite of tests to be used during manufacturing to ensure that everything on your Morpheus is working correctly. Unless something goes horribly wrong, there shouldn't be a reason that you ever need to worry about it.

However, like **Calibrate**, it's self-guiding, so if you're just curious, you're welcome to play with it, since it can't do any harm.

Hints for Playing Back WAV Files

The basic requirements for successful WAV file playback for software updates and data transfer is that the file should be played back at the **highest possible level without distortion**. As long as it doesn't distort, the hotter the better.

We've had good luck playing WAV files directly from a computer (but see the warnings below) as well as smartphones and tablets.

In theory, any device that will play a WAV file without distorting the data should work.

However, here are some caveats:

- > If you are steaming the file directly from the web, be sure that your data rate is sufficient to keep up. If necessary, wait until the file has been completely buffered before starting playback.
- > If you are playing the file from a computer or phone, quit Facebook, your email client, and any other software that produces audio. Any other audio injected into the stream will cause the transfer to fail.
- > If you're using a smartphone, temporarily placing it in Airplane Mode will prevent any incoming call or message notifications from interfering with playback.
- > We have found that **Safari** on the **Mac** plays the file in a way that often keeps it from being successfully recognized and decoded. If you are using **Safari**, we recommend downloading the WAV file to your computer and playing the file from the local copy using **Quicktime Player**.
- > In fact, if you are having **any** problem streaming the file, downloading the file locally and playing it from there is a good alternative.
- > If you do get an error message during a transfer (e.g., the level was too low, your computer generated extraneous audio, etc.), you can just correct the problem and try again. However, we've found that rather than just playing the file again from the beginning, it's usually advisable to close the file, reopen it, and then start playback.

11. Factory Cubes

Null Cube

C000 Null Cube

The Null Cube has a completely flat frequency response under all parameter settings. You can use it as a "Bypass" setting. The filter left and right gains are still effective.

Frequency: No Effect

Morph: No Effect

Transform: No Effect

Distortion: No Effect

Flangers

C001 LPFlange.4

Frequency: Starts with high end roll-off and deep, narrow notches around 60, 120, 230, 460 and 920 Hz and transforms into less deep, wider notches around 12, 14, 16, 18 and 19 kHz with no roll-off.

Morph: Controls brightness as well as sweeping notches upwards.

Transform: Results in a highpass effect, transitioning into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. Distortion adds interesting resonances near the notches.

C002 LPFlangBk.4

A series of deep notches spaced at octave intervals morphing to less severe, more closely clustered high frequency notches. An additional lowpass filter is at low Frequency CV, opening as the maximum Freq CV is reached.

Frequency: Modulate this to create multi-flanging effects.

Morph: Controls brightness as well as sweeping notches upwards.

Transform: Results in a highpass effect, transitioning into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. Distortion adds interesting resonances near the notches.

C003 Flange2.4

This flanger has a series of 6 notches placed at octaves, not linearly. With all CVs at minimum, the notches are around 56, 112, 225, 450, 900, and 1800 Hz.

Frequency: Moves all of the notches up in frequency to above 10 kHz, with decreasing depth. This means that the deepest flanging effect is obtained in the first 1/3 to 1/2 of the Frequency CV range. Note that deep notches can cut out the fundamental of a sound which might decrease the volume of the note.

Morph: Moves the notches upward slightly.

Transform: Results in a highpass effect, transitioning into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. Distortion adds subtle resonances near the notches.

C004 CubeFlanger

A flanging filter featuring deep notches tuned in octaves and a steep roll-off of high frequencies when all axes have no offset. High Transform CVs can produce some rather metallic-sounding overtones. Apart from flanging effects, this filter can be used in much the same way as a standard resonant synth filter.

Frequency: Tunes the filter notches.

Morph: Controls lowpass filter cutoff point.

Transform: Increases resonance and introduces some peaks.

Distortion: Increases resonance, sometimes dramatically, and distorts and drags the peaks.

C005 Flange3.4

The notches start at about 40Hz, and the higher ones are spaced at a ratio of 1.61 between notch frequencies. This spacing means that notches will not fall on top of all of the harmonics of a sound at once. Instead,

they should hit harmonics one at a time as they are swept in frequency. Traditional flangers have notches spaced linearly, not log spaced.

Frequency: Moves all of the notches up above 10 kHz, with the relative frequency spacing decreasing. The deepest flange effect will happen in the lower 1/3 to 1/5 of the morph parameter range.

Morph: Sets the initial tuning of the notches, moving all of the notches up from 40Hz to 375 Hz as the base frequency.

Transform: Results in a highpass effect, transitioning into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. Distortion adds pleasant resonances near the notches.

C006 Flange4.4

A highly resonant flanger/filter type. Sweeping the Frequency CV produces dramatic effects. The Morph CV can be used to tune the flanger; higher voltages produce more open sounds.

Frequency: Increase to raise the cutoff frequency and vary the gain of the various peaks and notches.

Morph: Tunes the filter.

Transform: Transitions into a null filter at maximum, with varying effects in between.

Distortion: In the default filter, Transform Controls Distortion. Distortion dramatically increases the primary resonance with sometimes wild results.

C007 Flange5

A complex flange possessing some vocal-sounding characteristics. Sweeping along the Morph or Frequency axes produce flanger-like effects.

Frequency: Tunes the notches.

Morph: Spreads the notches.

Transform: Increase this to move the filter toward a more flat curve.

Distortion: Provides harsh feedback-like effects.

C008 Flange6.4

Introduces both peaks and notches which start widely spaced and become more tightly distributed as Morph CV reaches maximum. The center frequencies for the various filter bands move towards higher ranges as the Morph or Frequency CVs are swept upward; the effect is not unlike a sweeping of multiple resonant band-pass filters.

Frequency: Moves all of the notches and peaks up in frequency.

Morph: Pulls the notches and peaks together. Transform: Results in a highpass effect, transitioning into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. Distortion accentuates the resonances, and can heavily distort them at high settings.

C009 Flange6R.4

This is a variation of cube C008, Flange 6.4. It is a bit more resonant-sounding, due in part to higher 'Q' settings. Sweeping the Morph CV can produce the syllable 'yi'.

Frequency: Sweeps filter frequency bands up and together when modulated in a positive direction.

Morph: Sweeps filter frequency together and somewhat upward when modulated in a positive direction.

Transform: Results in a highpass effect, transitioning into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. Distortion accentuates the resonances, and can heavily distort them at high settings.

C010 Flange7.4

A series of harmonically related notches is moved from the lower-midrange to the upper-midrange as the Morph CV is swept. The Frequency CV produces a broader flanging effect, bringing the notches to high frequency and then taking them away, producing a flat frequency response at maximum.

Frequency: Use this to sweep the notches or take them away.

Morph: Use this to tune the notches.

Transform: Results in a highpass effect, transitioning into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. Distortion accentuates resonances near the notches.

C011 BriteFlng.4

A series of notches, tuned in octaves, are swept upward and finally converge at 19 kHz as this filter is pushed up using the Frequency CV. A small bump at about 15kHz is introduced to maintain brightness when the Frequency CV is at maximum.

Frequency: Increasing this value sweeps the filter notches upward and together.

Morph: Increasing this raises the lowpass filter cutoff point.

Transform: Results in a highpass effect, transitioning into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. Distortion accentuates resonances near the notches and particularly the lowpass cutoff, sometimes to the extreme.

C012 Flng>Flng1

Frequency: Sweeps between two different flangers.

Morph: Track a note's fundamental frequency to maintain or modify the spectrum.

Transform: Provides volume and brightness control; the gain can be a bit high at higher CV values; use the Left and Right Gain parameters in the filter to control this if necessary.

Distortion: Accentuates a primary resonance, often dramatically, allowing feedback and frequency dragging effects at higher settings.

Comments: Frequency tracking enhances the depth of the flange. Try adding CV to Frequency for more "Fun".

C013 LP>Flng2

Morphs from a relatively benign lowpass frequency response into a flanger.

Frequency: Track note frequency to maintain spectrum or accentuate the lowpass and flange.

Morph: Reveals flat to flange filter frequency response.

Transform: Adds volume and changes the flange.

Distortion: Dramatically accentuates a primary resonance, quickly producing some major grunge. Keep it low for a clean sound.

Comments: Nice for introducing a subtle flange to a pure sound. Create natural effects increasing flange depth, volume and brightness.

C014 Flng>Flng3

Another cube that morphs between two different flangers.

Frequency: Sweeps the frequency for tracking or enhancing the flange.

Morph: Sweeps between the two different flangers.

Transform: Increases the depth of the flange. Distortion: Dramatically accentuates several resonances, producing a very rich result.

Comments: A gentler sweep than C012. Nice for introducing a subtle flange to a pure sound. Create natural effects increasing flange depth, volume and brightness. Distort it for lots of harmonic brilliance.

DPR: This filter seems a bit hot, maybe its default gain should be lowered.

C015 Flng>Flng4

Yet another cube that morphs between two different flangers.

Frequency: Sweeps the frequency for tracking or enhancing the flange.

Morph: Sweeps between the two different flangers.

Transform: When Morph or Frequency CV is high, reduces depth of flange effect. When both Frequency and Morph are low, sweeps the frequency upward before reducing the depth.

Distortion: Dramatically accentuates several resonances, at high settings merging into grunge.

C016 Flng>Flng5

And yet another cube that morphs between flangers. At low Morph and Frequency CV, the filter is simply lowpass.

Frequency: Sweeps the frequency for tracking or enhancing the flange.

Morph: Sweeps between the two different flangers.

Transform: Increases depth of flange, more bell-like. Also, decreases the notch and resonant frequencies with increasing CV.

Distortion: Accentuates several resonances, increasing the bell-like sounds until they overload.

Comments: Morphing sweeps gently, but Transform adds more depth and introduces a bell-like quality to the flange.

C017 Flng>Flng6

And another cube that morphs between flangers.

Frequency: Sweeps the frequency for tracking or enhancing the flange.

Morph: Sweeps between the two different flangers.

Transform: Provides more brightness and flange.

Distortion: Subtly accentuates several resonances.

Comments: A mellow, well-behaved flanger.

C018 Flng>FlngT

A gentle-touch flanger morph.

Frequency: Sweeps the frequency for tracking or enhancing the flange.

Morph: Sweeps between flangers.

Transform: Provides more brightness and flange, particularly at higher Frequency CVs.

Distortion: Dramatically accentuates a primary resonance. Produces some nice feedback-like effects.

Comments: Low Transform gives a soft chorus on morphing. Higher Transform gives exaggerated depth.

C019 Flng>FlngC

A rather different morphed flanger.

Frequency: Sweeps the notches and peaks, and controls brightness.

Morph: Sweeps from open to closed response when Transform CV is low and Frequency is low or mid-range.

Transform: Adds extra flange and has interesting effects on the other CVs.

Distortion: Accentuates several resonances, in a generally pleasant and useful manner.

C020 CO>FlngT

And another unusual morphed flanger.

Frequency: Raises frequency of peaks and notches.

Morph: Modestly adjusts the peaks and notches at low Transform CV, dramatically adjusts them at high Transform CV.

Transform: Increases brightness and depth of flange.

Distortion: Dramatically accentuates several resonances, at high settings merging into grunge.

Diphthong Filters

Implemented with parametric equalizer subsections, the resonances do not have the traditional overall low pass effect that a true vocal resonance would have. Instead, they are placed at the same frequency as the resonances would be found in a true vowel, but the response at high frequencies is essentially flat to allow high frequencies of the signals to get through the filter.

The Morph axis controls movement between vowels. Brightness and depth of effect is controlled by Transform. In certain filters, brightness is controlled by the Frequency CV. Each paravowel 'A' contains peaks at around 800, 1150, 2800, 3500 and 4950 Hz. Each paravowel 'E' contains peaks at around 400, 1600, 2700, 3300 and 4900 Hz. Each 'O' has peaks at around 450, 800, 2830, 3500 and 4950 Hz. Each 'U' has peaks at around 325, 700, 2530, 3500 and 4950 Hz.

C021 AEPaLPVow

This paravowel has a low pass filter to provide additional roll off, when desired. Otherwise, it behave as the other paravowels.

Frequency: Shifts all of the resonances up in frequency.

Morph: Controls movement between vowels. Try maximum Transform for additional brightness.

Transform: Controls volume and depth of effect.

Distortion: Harmonics will excite the resonances further, frequently distorting them.

C022 AEParaVowel

Frequency: Shifts all of the resonances up in frequency.

Morph: Controls movement between vowels.

Transform: Controls the amplitude of all of the resonances, with -5V providing the lowest resonance amplitude, and +5V providing the highest.

Distortion: Harmonics will excite the resonances further, frequently distorting them.

C023 AOLpParaVow

This paravowel has a low pass filter to provide additional roll off, when desired. Otherwise, it behaves as the other paravowels.

Frequency: Shifts all of the resonances up in frequency.

Morph: Controls movement between vowels. Try maximum Transform.

Transform: Controls the amplitude of all of the resonances.

Distortion: Harmonics will excite the resonances further, frequently distorting them.

C024 AOParaVowel

Frequency: Shifts all of the resonances up in frequency.

Morph: Controls movement between vowels. Try maximum Transform.

Transform: Controls the amplitude of all of the resonances.

Distortion: Harmonics will excite the resonances further, frequently distorting them.

C025 AUParaVow.4

Frequency: Shifts all of the resonances up in frequency.

Morph: Controls movement between vowels.

Transform: Spans a 90° twist on the Frequency and Morph parameters.

Distortion: In the default filter, Transform Controls Distortion. Harmonics will excite the resonances further, frequently distorting them.

C026 UOParaVow.4

Frequency: Shifts all of the resonances up in frequency.

Morph: Controls movement between vowels.

Transform: Spans a 90° twist on the Frequency and Morph parameters.

Distortion: In the default filter, Transform Controls Distortion. Harmonics will excite the resonances further, frequently distorting them.

C027 SftEOVowl.4

Frequency: Shifts all of the resonances up in frequency.

Morph: Controls movement between vowels.

Transform: Spans a 90° twist on the Frequency and Morph parameters.

Distortion: In the default filter, Transform Controls Distortion. Harmonics will excite the resonances further, frequently distorting them.

C028 SoftEOAE

This cube morphs among three vowels. Low Frequency and low Morph CVs, or high Frequency and high Morph CVs both produce an 'E.' Low Frequency and high Morph produces an 'O,' while high Frequency and low Morph produces an 'A.'

Frequency: Controls movement between vowels.

Morph: Controls movement between vowels.

Transform: Brightens the sound.

Distortion: Harmonics will excite the resonances further, frequently distorting them.

C029 Vocal Cube

Produces a variety of vocal sounds.

Frequency: Controls movement between vowels.

Morph: Brightness control.

Transform: Controls movement between vowels.

Distortion: Harmonics will excite the resonances further, frequently distorting them.

C030 C1-6Harms.4

Frequency: Controls the frequency of the notch and peaks.

Morph: Sweeps between a notch at 230 Hz to a series of closely spaced peaks from 80Hz to 530 Hz

Transform: Transitions into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. Distortion accentuates the resonances and results in some very nice effects.

C031 Voce.4

Frequency: Controls of brightness.

Morph: Controls movement between 'oo' and 'ee'.

Transform: Spans a 90° twist on the Frequency and Morph parameters.

Distortion: In the default filter, Transform Controls Distortion. Harmonics will excite the resonances further, frequently distorting them.

C032 ChoralComb.4

Frequency: Shifts the frequency upward with about a 2 octave range.

Morph: Sweeps between different frequency notches tuned for vocal formants.

Transform: Results in a highpass effect, transitioning into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. Distortion here results in quite a bit of gain, so frequently the Left/Right gain should be adjusted when used.

C033 Bassutoi.4

Frequency: Increases the frequency of the resonant peaks, and controls brightness.

Morph: Controls movement between 'yu' and 'ee'.

Transform: Spans a 90° twist on the Frequency and Morph parameters.

Distortion: In the default filter, Transform Controls Distortion. Harmonics will excite the resonances further, frequently distorting them.

C034 Be Ye.4

Designed to say 'Be Ye'.

Frequency: Sweeps the filter over about an octave.

Morph: Sweeps the vocal formants.

Transform: Transitions into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. Distortion accentuates the resonances and results in some very nice effects.

C035 Ee-Yi.4

Frequency: Sweeps the filter over about two octaves.

Morph: Controls movement between vowels 'e' and 'i'.

Transform: Transitions into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. Distortion accentuates the resonances and results in some very nice effects.

C036 Ii-Yi.4

Frequency: Sweeps the filter over about two octaves.

Morph: Controls movement between vowels.

Transform: Transitions into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. Distortion accentuates the resonances and results in some very nice effects.

C037 Uhrrah.4

Frequency: Sweeps the filter over about two octaves.

Morph: Roars like a lion.

Transform: Transitions into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. Distortion accentuates the resonances and results in some very nice effects.

C038 YeahYeah.4

Frequency: Sweeps the lowest peak upward, and brightens the sound.

Morph: Moves between 'ee' and 'ya' sounds.

Transform: Transitions into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. Distortion accentuates the resonances and results in some very nice effects.

C039 Vow>Vow1

Frequency: Shifts the frequency of the lower peaks, keeping the upper ones constant.

Morph: Sweeps between 'ah' and 'oh'.

Transform: Increases volume and depth of vowel effect.

Distortion: Dramatically increases the grabbing of resonances, giving feedback-like sounds.

C040 Vow>Vow2

Frequency: Shifts lower frequency notches, while resonances stay fixed.

Morph: Sweeps between 'ee' and 'oh'.

Transform: Provides volume and brightness control.

Distortion: Dramatically increases the grabbing of resonances, giving feedback-like sounds.

Comments: Morphing sweeps between vowels giving a slight 'E' effect.

C041 YahYahs.4

Frequency: Sweeps frequencies over two octaves higher for tracking and brightness control.

Morph: Sweeps between 'eeya' and 'aa'.

Transform: Transitions into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. Dramatically increases the grabbing of resonances, giving radical wild sounds.

C042 YoYo.4

Frequency: Sweeps frequencies over two octaves higher for tracking and brightness control.

Morph: Sweeps between 'ee' and 'oh' sounds.

Transform: Transitions into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. Dramatically increases the resonant peaks.

C043 VowelSpace

Dr. William Martens inspired this filter cube, which allows any vowel to be approximated with only two parameters.

Frequency: Sweeps the second formant from 500Hz up to 2500Hz.

Morph: Sweeps the first formant of the vowel from 300Hz up to 850Hz.

Transform: Changes the vowel "stress." Low stress means that all of the vowel frequencies collapse to a relaxed "schwa" sound. Maximum Transform produces the maximum excursion (stress) for all of the vowel frequencies.

Distortion: Dramatically increases the grabbing of resonances, giving feedback-like sounds.

Standard Filters

These filters are variations on traditional 2 and 4-pole synthesizer filters

C044 BrickWaLP.4

This filter features an extreme rolloff at the cutoff point, which moves from 100 Hz to 3 kHz. Use this filter to produce low-resonance filter sweeps, or to selectively filter out high frequencies in the source sound.

Frequency: Controls filter cutoff frequency.

Morph: Controls filter depth and provides gentler roll-off beginning \approx 3 kHz.

Transform: Transitions into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. Provides distortion, at the extreme emphasizing the fundamental and overtones of the input.

C045 BrickWaLP2

This filter has a sharp rolloff at the cutoff point, which moves from 60 Hz to 2.5 kHz, with a variable resonance.

Frequency: Controls filter cutoff frequency.

Morph: Controls filter resonance (Q).

Transform: Also controls filter cutoff frequency.

Distortion: At low resonances, produces a distorted waveform; at high resonances can pick off and grab harmonics and overtones.

C046 MdQ 2PoleLP

A single complex pole of this filter is swept from low to high by the Frequency CV. This filter produces nice, not-too-resonant sweep effects.

Frequency: Controls filter cutoff frequency.

Morph: Also controls filter cutoff frequency.

Transform: Controls resonance (Q).

Distortion: Will subtly add distortion of overtones at moderate levels, and pick out the overtones with more distortion at extreme levels.

C047 HiQ 2PoleLP

A more resonant version of filter C046 (MdQ 2PoleLP), with a single frequency band being swept about with the Frequency CV.

Frequency: Controls filter cutoff frequency.

Morph: Also controls filter cutoff frequency.

Transform: Controls resonance (Q).

Distortion: Will subtly add distortion of overtones at moderate levels, and pick out the overtones with more distortion at extreme levels.

C048 MdQ 4PoleLP

Similar to filters C046 (MdQ 2PoleLP) and C047 (HiQ 2PoleLP), in this filter two of the complex poles (tuned to the same frequency) are swept to create a steeper rolloff at the cutoff point, re-creating the classic 4 (real) pole lowpass filter effect. This filter features medium resonance which can be accentuated via the Transform CV.

Frequency: Controls filter cutoff frequency.

Morph: Also controls filter cutoff frequency.

Transform: Controls resonance (Q).

Distortion: Will subtly add distortion of overtones at low levels, and pick out the overtones at moderate levels, and grab and drag overtones almost like oscillations at extreme levels. Beware, if you extremely distort low frequencies, it may take tens of seconds (or more!) for the filter to ring down.

C049 HiQ 4PoleLP

Again, as with filter C049 (MdQ 4PoleLP), two complex poles tuned to the same frequency are swept to create a steeper rolloff at the filter cutoff point. This filter features high 'Q', which can be controlled via the Transform CV.

Frequency: Controls filter cutoff frequency.

Morph: Also controls filter cutoff frequency.

Transform: Controls resonance (Q).

Distortion: Will subtly add distortion of overtones at low levels, and pick out the overtones at moderate levels, and grab and drag overtones almost like oscillations at extreme levels. Beware, if you extremely distort low frequencies, it may take tens of seconds (or more!) for the filter to ring down.

C050 2 PoleLoQ.4

This is a 2-pole lowpass filter which can be swept from 70Hz to 19.5kHz. Modulating the Morph CV upward will increase filter resonance. A good choice for emulating certain kinds of analog filter effects.

Frequency: Controls filter cutoff frequency.

Morph: Controls resonance (Q).

Transform: Transitions into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. Provides distortion, at the extreme emphasizing the fundamental and overtones of the input.

C051 4PoleLoQ.4

A resonant low-pass filter emulation. Sweeping the Frequency CV creates the familiar filter sweep effect.

Frequency: Controls filter cutoff frequency.

Morph: Controls resonance (Q).

Transform: Transitions into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. Will subtly add distortion of overtones at low levels, and pick out the overtones at moderate levels, and grab and drag overtones almost like oscillations at extreme levels. Beware, if you extremely distort low frequencies, it may take tens of seconds (or more!) for the filter to ring down.

C052 4PoleMidQ.4

A 4-filter version of the classic 4-pole resonant filter found in most analog synthesizers.

Frequency: Controls filter cutoff frequency.

Morph: Controls resonance (Q).

Transform: Transitions into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. Will subtly add distortion of overtones at low levels, and pick out the overtones at moderate levels, and strongly grab and drag overtones almost like oscillations at extreme levels.

C053 2pole>4pole

This All Pole filter is modeled on traditional low pass filter. It has a soft resonance boost, and controllable cutoff slope.

Frequency: Opens up the filter making it brighter.

Morph: Adds a small amount of resonance (Q) to the filter.

Transform: Changes from a 2-pole filter (-12dB/oct.) to a 4-pole filter (-24dB/oct.).

Distortion: Will subtly add distortion of overtones at moderate levels, and pick out the overtones with more distortion at extreme levels.

C054 LowPassPlus

Frequency: Controls filter cutoff frequency.

Morph: Sweeps from octave peaks starting at 250 Hz to inharmonic, higher frequency peaks.

Transform: Brightens the response.

Distortion: Creates an interesting, aharmonic mild grunge at low levels, transitioning to peak grabbing at high levels.

C055 Low Past.4

Poles with fairly high 'Q' settings are grouped into the lower- to uppermidrange. Sweeping the Morph or Frequency CVs can produce some rather vocal-sounding effects.

Frequency: Use to tune the filter.

Morph: Use to sweep the frequencies of the pole.

Transform: Transitions into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. Adds distortion creating overtones at low levels, which then cause the high frequency peak to resonate. At extreme levels, it gets a bit out of hand, but maybe you like that sort of thing.

C056 APass.4

A lowpass filter with gentle rolloff above 500 Hz that can be morphed to flat. A good choice when more subtle filtering is desired.

Frequency: Controls filter cutoff frequency.

Morph: Gentle lowpass to flat response.

Transform: Transitions into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. Creates only very subtle distortions, which depend on the incoming waveshape.

C057 HPSweep.4

A highly resonant high-pass filter which generally rolls off frequencies steeply below ≈ 2.5 kHz. Lowest Frequency CV and highest Morph CV provides a relatively flat response (with a gentle cut to the lower frequencies), so the most subtle filtering is achieved with Morph high and Frequency low.

Frequency: Positive values move the filter higher in frequency.

Morph: Positive values move the filter toward a flatter curve.

Transform: Transitions into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. Creates nonlinearities that bring out the fundamental, but not in a particularly pleasing way.

C058 HiSwept1.4

A highly resonant filter with 'Q' increasing as the Morph or Frequency parameters are swept upward. At minimum Frequency CV, Morph has no effect, but as Frequency CV is increased, increasing Morph provides more resonance and brightness.

Frequency: Controls filter cutoff frequency.

Morph: No effect at minimum Frequency CV; adds resonance and brightness at higher Frequency CVs.

Transform: Spans a 90° twist on the Frequency and Morph parameters.

Distortion: In the default filter, Transform Controls Distortion. Adds distortion creating overtones at low levels, which then cause the frequency peak to resonate. At extreme levels, you can drag those resonances nicely around in frequency.

C059 HghsSwpt.4

A more open-sounding version of filter C058 (HiSwept1.4). Both the filter cutoff frequency and 'Q' have been increased, and Morph is now effective at low Frequency CVs.

Frequency: Controls filter cutoff frequency.

Morph: Adds resonance and brightness.

Transform: Spans a 90° twist on the Frequency and Morph parameters.

Distortion: In the default filter, Transform Controls Distortion. Adds distortion creating overtones at low levels, which then cause the frequency peak to resonate. At extreme levels, you can drag those resonances nicely around in frequency.

C060 HighAccent.4

The center frequencies remain constant throughout all permutations of this filter along the Morph and Frequency CVs; what changes are the 'Q' settings for the various poles and zeros. This allows you to accentuate various resonances (generally in the upper frequency ranges) of the source sound by manipulating the Morph and Frequency CVs.

Morph: Controls 'Q' of the various poles.

Frequency: Higher values produce brighter, thinner sounds.

Transform: Transitions into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. Creates an odd gravelly or growling distortion at high levels.

C061 HiPassSweep.4

A high-pass filter with the cutoff point moving from about 180 Hz to upwards of 2.5 kHz (with a sizable gain in resonance) as Frequency CV is increased.

Frequency: Higher settings increase cutoff frequency and 'Q'.

Morph: Controls filter depth/slope. A higher CV gives lower slope and less filtering.

Transform: Transitions into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. At low morph levels, the distortion is quite powerful. When the morph is higher, the distortion is sometimes less aggressive, but this depends on the frequency, amplitude and waveshape of the input. In many cases, the onset of extreme distortion is very sudden, sometimes causing the filter to pin to the positive or negative rail, effectively "cutting out" the sound until CVs or the signal change.

C062 DeepCombs.4

This filter can provide a tremendous variety of comb-filtering and filter sweep effects. Higher frequencies are sharply attenuated with low Frequency and Transform CVs, so be sure at least one of these is either set in the mid-to-high range, or that modulation is used to offset them. Modulating Morph from a slow LFO produces a nice sweep; the Frequency control is more subtle.

Frequency: Positive CVs move frequency notches towards higher values.

Morph: Positive CVs move notches towards lower frequencies.

Transform: Transitions into a null filter at maximum.

Distortion: In the default filter, Transform Controls Distortion. The distortion is well behaved, and barks quite effectively when the knob is between 2:00 and 3:00.

C063 One Peak

Morphs from a simple lowpass to a complex filter with multiple resonances. The strongest, most characteristic sounds come from turning both Morph and Transform to their maximum. When you do this, the Frequency control and CV input have the most striking effect. Try it with a harmonically rich source, such as an atonal FM tone.

Frequency: Controls the lowpass cutoff and peak frequencies.

Morph: Sweeps from a gentle lowpass rolloff through a slight peak at around 220Hz and roll-off after 650Hz to a series of even peaks around 220, 440, 880Hz, and a smaller odd series at 330, 555 and 770Hz.

Transform: Increases the effect of Morph. Try setting Transform to +5V for increased brightness over the Morph range.

C064 More Peaks

All three knobs in this filter are quite active. Try creating a rhythmic pattern by inputting CVs from three different envelopes clocked with different rhythms.

Frequency: Shifts the frequency of the filter.

Morph: Moves from a gentle cut-off lowpass response to a series of peaks around 220, 440, 880, 330, 1000 and 2000Hz. Most effective with Transform at max.

Transform: Intensifies peaks and controls volume.

C065 Rev Peaks

Frequency: Shifts the frequency of the filter.

Morph: Moves from gentle low pass to a series of peaks around 220, 440, 660, 880, 1100 and 1320. Best with Transform at max.

Transform: Produces higher gain peaks at same frequencies as the Morph axis for volume control and more dramatic effect.

C066 Notcher 2.4

Notches!

Frequency: Sweeping from -5V to +5V transitions from widely spaced notches to tightly spaced notches to a flat response. Sweeping over a narrow range with a

moderately fast LFO produces some nice phasing and rotating speaker effects.

Morph: Shifts the frequencies of the notches.

Transform: In the default filter, Transform Controls Distortion. With no distortion added, this filter does a pleasant job of notching. When Morph and Distortion are turned to max, dropping the Frequency value to the bottom can cause the distortion to become a lot more intense rather suddenly.

C067 Ntches2Oct.4

This filter is composed of a series of notches, tuned in octaves. Maximum shift is two octaves along either the Frequency or Morph axis, for a combined total of four octaves if both axes are modulated.

Frequency & Morph: Shifts the frequency of the notches.

Transform: In the default filter, Transform Controls Distortion.

C068 Odd>+

Odd, highly resonant harmonics whose shape is modified by Transform. A very aggressive preset, even though Distortion is not turned on. For clean sweeps, keep the Transform value very low.

Frequency: Shifts the harmonics' frequencies
Morph: Adjusts the position of the harmonics.

Transform: Provides volume and brightness and distortion control. Can get quite extreme.

C069 VarSlope.4

A low-pass filter in which the rolloff above the cutoff point (400Hz) becomes steeper as the value for Morph is increased. A good choice when more subtle filtering is desired. Distortion is switched on in the preset, but it only adds a tasty bit of coloration, nothing aggressive. Try using a digital oscillator waveform with some noticeable detuning, as the buzz of the detuning adds to the filter color.

Frequency: Controls the cutoff frequency.

Morph: Changes the slope of the rolloff.

Transform: In the default filter, Transform Controls Distortion.

Equalization Filters

Most of these filters are variations of traditional parametric EQ filters.

C070 BassEQ 1.4

Frequency: Controls frequency of bands. Opens filter completely at max.

Morph: Produces a deep notch around 196Hz, morphing to a slight bump around 132Hz and a dip around 2600Hz.

Transform: In the default filter, Transform Controls Distortion.

C071 B BOOST.4

Frequency: Provides gentle rise at 320Hz and 5kHz.

Morph: Boosts frequencies around 60Hz, sweeping to open response.

Transform: In the default filter, Transform Controls Distortion. Turn up to about +3V for tasty distortion as Frequency and Morph are varied.

C072 BssBOOST2.4

Frequency: Introduces a dip around 320Hz and a peak around 2059Hz. With axes offset, a bump at 60Hz and 1200Hz is introduced.

Morph: Boosts frequencies around 60Hz, sweeping to open response.

Transform: In the default filter, Transform Controls Distortion. At modest levels, produces nice warm distortion.

C073 BassDrumEQ

This is an EQ filter designed for bass drum-type sounds, based on a low pass EQ filter. The Transform tailors the filter to different types of bass drum sounds.

Frequency: Turn the Frequency to maxTunes to produce a narrow peak in the filter response, then tune the peak as desired using Morph.

Morph: Tunes the peak created by the Frequency control and adds low end boost.

Transform: Adds high end at the expense of low end.

C074 Snare LPEQ2

This is an EQ filter designed for snare-type sounds, based on a low pass EQ filter. There is a strong boost in the 320Hz to 640Hz range and some boost on the low end to give it some punch. Transform tailors the filter for different types of snare sounds.

Frequency: Controls brightness.

Morph: This moves the mid range bump down a bit.

Transform: This will smooth the boost (widens the 'Q').

C075 HiHatLPEQ

This is an EQ filter designed for hi hat-type sounds, based on a low pass EQ filter. There is a strong boost in the 5kHz to 18kHz range and some cut on the low end. Transform tailors the filter for different types of high-hat sounds.

Frequency: Shifts the frequencies of the bands.

Morph: Shifts the spacing of the bands.

Transform: More band shifting.

Complex Filters

Many of these filters have never existed for musical applications before!

C076 HP LP PZ

This Pole/ Zero filter models both low pass and high pass filters.

Frequency: Controls the cutoff frequency.

Morph: Controls the cutoff slope

Transform: Controls the transition from high pass to low pass.

C077 PZ Notch

This Pole/ Zero filter is a notch that ranges from 80Hz to 10kHz.

Frequency: Sets the notches' center frequency.

Morph: Interacts with the Transform control to modify the notches' shapes.

Transform: Interacts with the Morph control to modify the notches' shapes.

C078 Band-aid

This Pole/ Zero filter is a band pass that cuts both the high and low end of the audio.

Frequency: Controls amount of low cut.

Morph: Controls bandwidth.

Transform: Controls amount of high cut.

C079 4>2 LowQHiQ

This All Pole filter is modeled on traditional low pass filter types. It can emulate most familiar 2-4 pole analog filter sounds.

Frequency: Controls cutoff frequency.

Morph: Changes from a 4-pole filter (-24dB/oct.) to a 2-pole filter (-12dB/oct.)

Transform: This adds resonance ('Q') to the filter.

C080 Wah4Vib.4

Frequency: Controls low pass cutoff frequency.

Morph: Controls resonant peak.

Transform: In the default filter, Transform Controls Distortion.

C081 Wa Wa.4

Multiple resonant peaks flatten, then invert to become notches as the value of Morph is increased. Increasing the value of Transform can have the effect of sweeping the peaks lower in frequency, inverting the peaks, or both, depending on the settings for Morph and Frequency.

Frequency: Controls the frequency of the peaks or notches.

Morph: Transitions from peaks to notches.

Transform: In the default filter, Transform Controls Distortion.

C082 BrassRez.4

Trumpet mute effect.

Frequency: Modulates between a similarly shaped second set of resonances.

Morph: Increasing Morph results in a less muted, more open response.

Transform: In the default filter, Transform Controls Distortion.

C083 Clr>Oboe

Morph between the resonant frequencies characteristic of clarinets and oboes.

Frequency: Shifts the frequencies of the resonances.

Morph: Morphs between clarinet and oboe resonances

Transform: Modifies the height of the resonant peaks.

C084 O>Muter

This filter lets you morph between various types and amounts of resonance typical of instrument mutes.

Frequency: Shifts the frequencies of the resonances.

Morph: Controls the amount of muting.

Transform: Modifies the character of the muting.

C085 PZ Syn Horn

This filter models the harmonic content of a synthesized horn sound, thus will lend a synth horn sound to other audio.

Frequency: Controls the frequency of the resonances

Morph: Controls brightness.

Transform: This makes a modest change in brightness (fine tuning).

C086 HP Brass

Generally, each vertex of this cube provides either a steep rolloff of low frequencies or a sharp boost of high frequencies. Note that with Transform set to max, the polarity of the sweep along the Morph axis is reversed. This filter can be a good choice when you need a sharp accentuation of high-frequency material.

Frequency: Controls the highpass cutoff frequency

Morph: Sweeps the highpass filter, with direction dependent on setting of Transform.

Transform: Sweeps the highpass filter, with direction dependent on the Morph value.

C087 BrassyBlast

This filter provides several responses similar to that of a lowpass filter, but with the addition of a gentle bump in the midrange to upper-midrange. Useful for brass-type filter sweep effects.

Frequency: Controls the cutoff frequency.

Morph: Adds a resonant bump at about 200Hz, which flattens out as the value is moved upward.

Transform: Interacts with Frequency and Morph to subtly modify the frequency response.

C088 Brass Swell

Similar to a lowpass filter, but multiple resonant peaks give this one a bit of avocal, phase-shifter-like quality.

Frequency: Controls the cutoff frequency.

Morph: Modifies the cutoff slope.

Transform: Higher values add midrange "beef" and resonance.

C089 BrsSwell2.4

Another lowpass filter with low resonance designed for brass-type filtersweeps. This time with the ability to add some warm distortion.

Frequency: Moves the cutoff frequency higher, and adds a gentle bump in the upper-midrange.

Morph: Adds a bit of resonance at the cutoff point, which becomes flatter as Morph is increased.

Transform: In the default filter, Transform Controls Distortion.

C090 LoVelTrum

A series of tightly spaced peaks is swept upward by each of the filter transforms, with the brightest sounds obtained at maximum settings for Morph, Frequency, and Transform. In addition, Transform increases the resonance.

Morph & Frequency: Sweeps the peaks.

Transform: Controls the height of the peaks.

C091 Chiffin.4

Use with noise as an input to create a chiff sounds.

Frequency: Controls the frequency of the notches.

Morph: Sweeps between low frequency notches.

Transform: In the default filter, Transform Controls Distortion.

C092 ShakuFilter

Frequency: Controls the frequency of the resonances.

Morph: Sweeps between peaks around 400Hz, 1600Hz, 2700Hz and 3150Hz with roll-off after 10kHz to a mostly flat response with a slight bump at 1900Hz.

Transform: Controls tone and depth.

C093 Cym

Designed to make interesting cymbal sounds. Both Morph and Frequency manipulate frequency sweeps.

Frequency: Controls the frequency of the resonances.

Morph: Controls the frequency of the resonances.

Transform: Controls peak heights.

C094 VelMarim

Designed to make dynamic marimba-like sounds using percussive mallet-like timbres. But good for all sorts of other things as well.

Frequency: Controls the spacing of small, closely-spaced peaks.

Morph: Controls a wide resonant peak.

Transform: Controls peak spacing and low frequency content.

C095 EZ Vibez.4

This is a 2-pole low-pass filter, sweeping from a gentle roll-off at 65Hz to reveal a wide open response.

Frequency: Sweeps from lowpass to open response.

Morph: Controls cutoff frequency

Transform: In the default filter, Transform Controls Distortion.

C096 Piano 01

In the original Morpheus, this cube was designed to make possible a set of Piano presets that sound like they were recorded with the sustain pedal down. However, it provides some amazing morphing peaks that can be used for wildly dynamic effects with any harmonically rich input.

Frequency: Peaks move around!

Morph: Interacts with Transform to control height and location of peaks.

Transform: Interacts with Morph to control height and location of peaks.

C097 Piano 2.4

This cube functions much like a lowpass filter with a low 'Q' setting. Although this filter is designed to work well for adding expressiveness to piano-type sounds, it can also be useful in many instances when a filter with a gentle slope is required. A little distortion also adds some rich character.

Frequency: Controls cutoff frequency.

Morph: Controls cutoff frequency.

Transform: In the default filter, Transform Controls Distortion.

C098 EZ Rhodez4

A lowpass filter, with cutoff frequency ranging from about 200Hz to about 5kHz. Add a little distortion for character.

Frequency: Controls cutoff frequency.

Morph: Controls cutoff frequency.

Transform: In the default filter, Transform Controls Distortion.

C099 MoogVocodr.4

Designed to simulate the classic vocoder filter response. Add distortion for some extreme effects.

Frequency: Sweeps all peaks

Morph: Sweeps high peaks.

Transform: In the default filter, Transform Controls Distortion.

C100 MoogVocSwp

Similar to "MoogVocodr.4", but brighter. Can create a variety of interesting responses by modulating the values of each axis.

Frequency: Sweeps lower peaks.

Morph: Sweeps upper peaks

Transform: Interacts with Morph to affect height and frequencies of peaks.

C101 StrngThing4

A series of widely spaced notches produces this filter, which can sound somewhat like a phase shifter when Morphed — especially if the value for Frequency is set fairly high. With Morph and Frequency set high, the curve is essentially flat, with a gentle bump approaching 20 kHz, so this filter might be a good choice for adding a subtle sparkle to some sounds.

Frequency: Controls notch frequency and depth of notches.

Morph: Controls high-frequency response

Transform: In the default filter, Transform Controls Distortion.

C102 StrSweep.4

Set Frequency towards max and gently modulate the Morph parameter in its upper ranges for an effect that will accentuate bowing-type sounds in string-like patches.

Frequency: Positive modulation increases brightness.

Morph: Creates a high frequency resonant peak.

Transform: In the default filter, Transform Controls Distortion.

C103 BassXpress

This cube provides increased bass, and a sharp notch.

Frequency: Controls the frequency of the notch.

Morph: Controls the depth of the notch.

Transform: Controls the lowpass filter cutoff slope.

C104 Qbase.4

Frequency: Sweeps frequency of peaks.

Morph: Transitions from a bright nasal response to an accentuated low-frequency boost.

Transform: In the default filter, Transform Controls Distortion.

C105 AcGtrRs.4

This filter is designed to emulate some of the resonant characteristics of an acoustic guitar body. With Morph and Frequency set to minimum, the body is extremely resonant, as if a large acoustic guitar were close-miked near the sound hole. Vary the value of Morph to vary the 'mic position.' Frequency controls brightness and 'pick position'.

Frequency: Controls low and high frequency responses.

Morph: Controls filter formant notch depth and position.

Transform: In the default filter, Transform Controls Distortion.

C 106 Tube Sust.4

Use this filter with broad-band audio input to produce sounds characteristic of distorted guitars. The fullest sounds are achieved with Morph set to max, and Frequency set to min. Add Distortion for extreme effects.

Frequency: Controls the lower-midrange.

Morph: Increasing Morph increases both bass and midrange.

Transform: In the default filter, Transform Controls Distortion.

C107 GtrSkwk

Originally designed to create the sound of a guitar "string squeak," this cube offers interesting effects with high frequency inputs.

Frequency: Controls cutoff frequency.

Morph: Controls cutoff slope and interacts with the Transform to control the character of the "squeak."

Transform: Controls the transition from no squeak to maximum squeak.

C108 GuitXpress

Increasing the Morph value places a notch in the frequency spectrum, the tuning of which can be controlled via the Frequency and Transform parameters. In addition, increasing the value for Frequency and/or Transform raises the cutoff point of the lowpass filter. This filter can be used to add a measure of expressiveness, particularly to acoustic instrument simulations.

Frequency: Tunes the notch and controls filter cutoff point.

Morph: Increases the depth of the filter notch.

Transform: Boosts high frequency response.

C109 G MajTrans.4

This filter features a series of peaks tuned to the intervals found in a major triad. Modulating Morph over its range moves the 'chord' from first to second inversion; the Frequency parameter can be used to tune the chord over a range of several octaves. The effect is perhaps easiest to hear applied to a noise source.

Frequency: Shifts the frequency of the chord.

Morph: Moves the 'chord' of resonant peaks from 1st to 2nd inversion.

Transform: In the default filter, Transform Controls Distortion.

C110 Tam

Designed to make interesting, dynamic tambourine-like sounds.

Frequency: Controls brightness.

Morph: Sweeps resonant peaks.

Transform: Controls brightness.

C 111 HOTwell.4

This cube works well with bell-like sounds, but also offers interesting multi-peak resonances with interaction between Frequency and Morph values.

Frequency: Transitions between a roughly lowpass response to a resonant bandpass to more widely spaced gentle peaks.

Morph: Sweeps the frequency range and modifies the position of the peaks.

Transform: In the default filter, Transform Controls Distortion.

C112 Bell Wah A

Morphing can pull bell-like sounds out of richly harmonic audio. Transform adds more dissonance.

Frequency: Controls the frequency of resonant peaks.

Morph: Controls the intensity of the resonant effect.

Transform: Controls the relationship of the resonant frequencies to add dissonance.

C113 Bell Wah B

Bell Wah B functions similarly to Bell Wah A above but uses different dissonant partials.

Frequency: Controls the frequency of resonant peaks.

Morph: Controls the intensity of the resonant effect.

Transform: Controls the relationship of the resonant frequencies to add dissonance.

C114 0>Bell-

Another cube that produces bell-like effects. Morphing sweeps resonances downwards away from harmonic values.

Frequency: Controls the frequency of resonant peaks.

Morph: Controls the intensity of the resonant effect.

Transform: Increases the bell-like effect, makes brighter, louder.

C115 0>Bell+

Similar to 0>Bell- above, but Morphing sweeps peaks to a different dissonant relationship.

Frequency: Controls the frequency of resonant peaks.

Morph: Controls the intensity of the resonant effect.

Transform: Increases the bell-like effect, makes brighter, louder.

C116 Bel>Crs>Bel

Another variation of bell-like timbres. Low values of Transform reveal a hint of bell-like quality. Higher Transform values create a more bell-like and dissonant sound.

Frequency: Controls the overall frequency of the resonant peaks.

Morph: Controls the relationship of the various peaks' frequencies.

Transform: Increases bell-like effect. Makes the sound brighter and louder.

C117 Chrs>Flng1

Morphs between chorus and flanging effects.

Frequency: Controls the frequency of peaks and/or notches

Morph: Sweeps flat->chorus->flange effects.

Transform: Sweeping from min to max boosts highs and attenuates lows.

C118 Chrs>Fng2

A variation of Chrs>Fng1 above, but with peaks and notches at different frequencies.

Frequency: Controls the frequency of peaks and/or notches

Morph: Sweeps flat->chorus->flange effects.

Transform: Sweeping from min to max boosts highs and attenuates lows.

C119 Ev/OdNtch.4

Produces notches tuned to the harmonic series. When adjusted to match the frequency of a harmonic input, Morph can transition between placing the notches on the even or odd harmonics.

Frequency: Controls the frequency of the notches.

Morph: Sweeps from notches around 200, 400, 800Hz, etc with gentle overall lowpass filtering to notches around 300, 600, 1200, 2400Hz, etc. effecting a warm to bright transition.

Transform: In the default filter, Transform Controls Distortion.

C120 Odd/EvnNtch

Similar to Ev/OdNtch.4 above, but in this case the notches are placed at octave intervals and Transform can control the depth of the notches.

Frequency: Controls the overall frequency of the notches .

Morph: Shifts the notches between adjacent series of octaves.

Transform: Controls the depth of the notches.

C121 NotchPeaks.4

This cube is useful for open formant shaping without too much filtering. It has moderately sharp resonance peaks which tend to overdrive when the Distortion/Transform amount exceeds +2.5V. Moderate amount of distortion adds a nice hollow ringing.

Frequency: Controls overall frequency of notches.

Morph: Sweeps from nasal to bright; vowel shifts from 'oh' to 'ee'.

Transform: In the default filter, Transform Controls Distortion.

C122 LoudBoost.4

This cube is generally a loudness booster. With full level Eurorack signals, this filter can overdrive quickly and cut drastically, so it's recommended to insert an attenuator to find the right level before the signal begins clipping. When applying Distortion, settings above the +2.5V level introduce clipping harmonics. Decreasing the filter patch's gain settings can minimize this effect, but the attenuator is an easier solution.

Frequency: Thickens the spectral plot.

Morph: Morphs from thin and high to richer and deeper to a yet a different timbre resonance; adds energy.

Transform: In the default filter, Transform Controls Distortion.

C123 Swingshift

Good for making cat meow sounds! This cube has the characteristics of a lowpass, with enhanced resonance peaks that add formant overtones. This cube is particularly useful if you need something different from a regular lowpass filter sweep. Modulating the Transform control enhances the resonant peak going from dark at -5.0V to a brighter tone at +5.0V setting.

Frequency: Modulates from low-frequency cut-off to a series of peaks around 349Hz, 494Hz, 698Hz, 988Hz etc.

Morph: Adjusts the cutoff frequency and/or resonant peak frequency.

Transform: Adds depth, volume.

C124 500up.4

Poles and zeros alternate, spaced at 500Hz intervals. Increasing Morph boosts the peaks slightly, and greatly deepens the notches, producing an effect similar to band-pass filtering. This effect is further accentuated by increasing the Frequency value, as well

as tuning the entire filter higher. This cube will also add a significant amount of gain to incoming signals. Either adjusting the internal gain settings or attenuating a Eurorack oscillator signal is highly recommended.

Frequency: Controls the frequency of the filter

Morph: Increases depth of notches.

Transform: In the default filter, Transform Controls Distortion.

C125C1Harmonic

This cube has the general characteristics of a lowpass filter. Morph adds a series of harmonic peaks separated by an octave. The harmonic series makes this patch useful in musical applications by sending quantized 1V/Oct voltages to the Full Level CV input.

Frequency: Controls Filter Center Frequency.

Morph: Controls resonance peak levels.

Transform: At -5.0V there is a slight emphasis around the filter center frequency. At +5.0V, the response in the sideband range is boosted and more emphasis is heard around the peaks.

C126 Odd>Even

This cube is useful for musical shifting of harmonics. Odd harmonics are replaced by even harmonics and can give an impression of raising one octave. This cube will increase the signal gain with Transform values greater than -2.5V that will quickly lead to overdriving signals especially when the Frequency is tuned to the fundamental of an incoming signal. Adjust the Transform to control the distortion, or attenuate the incoming signal from Eurorack oscillators.

Frequency: Shifts the overall frequencies of the peaks.

Morph: Changes from odds to even harmonics.

Transform: Controls brightness and volume.

C127 0>Shp1

Imposes a vowel like shape on a pure sound with a fairly drastic cut of higher harmonics through Morph modulation. This can be useful for transitioning between different sounds.

Frequency: Controls center frequency of filter.

Morph: Modulates from flat to resonant filter peaks.

Transform: Controls resonance characteristics.

C128 0>Shp2

Vowel like transform similar to 0>Shp1, but with steeper high frequency cuts. The resonant peaks of this cube do not affect signal gain as much and are less prone to overdrive and distortion.

Frequency: Controls center frequency of filter.

Morph: Changes from flat to resonant peaks.

Transform: Controls brightness and volume.

C129 0>Shp3

Like the previous 0>Shp cubes, this cube also provides a system that transitions from a lowpass to a complex resonant filter. Transform increases the resonance peaks which can lead to distortion when an oscillator source is in the frequency range of the cutoff frequency. Modulating the Morph parameter with a sequencer can create interesting vocoder like effects.

Frequency: Controls center frequency of filter.

Morph: Transitions from simple lowpass to resonant peaks.

Transform: Controls brightness and volume.

C130 Shp>Shp1

This cube is useful when you want a steep lowpass filter with the ability to transition into a formant filter. Modulating the Transform parameter with an envelope can create vowel shaping tones which are sonically more dynamic than static formants.

Frequency: Controls the center frequency of the filter system.

Morph: Controls the structure of the resonant peaks. At the -5.0V setting, the series of peaks are set every half octave from 66Hz. Increasing the control spreads the peaks to every octave beginning at 66Hz.

Transform: At -5.0V settings the cube provides the maximum resonant peak levels. This decreases as you adjust the control up to +5.0V, where the resonant peaks disappear.

C131 Lpeq Vel

This filtercube is quite a chameleon. It can transform from low pass to a sharp notch to a high pass to a sharp resonant peak high pass filter, depending on the combination of Morph and Transform settings. It's quite useful for taking a complex oscillator with rich harmonic overtones or noise sources that you want to transform with high pass sweeps. The resonant peak can be quite loud, so it's recommended that you attenuate the input signals.

Frequency: Controls the center frequency of the cube.

Morph: Changes the response from highpass to highpass with resonant peak to lowpass with modest resonant peaks.

Transform: Controls the height of the resonant peaks.

C132 PeakSweep.4

This is another complex multimode cube. A number of lowpass, highpass and bandpass type effects can be produced. It works particularly well to produce a variety of mute effects.

Frequency: Increase for thinner, brighter and more resonant

Morph: In combination with Frequency, effects range from lowpass with low 'Q' to highpass with high 'Q'.

Transform: In the default filter, Transform Controls Distortion.

C133 PowerSweeps

Alternating resonant peaks and notches, spaced at approximately half-octave intervals can be used to produce a number of flanging and vocal effects. The direction of Morph depends on the Frequency setting.

Frequency: Controls overall frequency; determines polarity of Morph.

Morph: Modulating Morph sweeps the peaks/notches up and/or down.

Transform: Affects the spacing and extent of the peaks and notches.

C134 TSweep.4

Increasing the Morph parameter creates a grouping of inharmonically related peaks, giving this filter something of a metallic quality, which can also produce voice-like sounds. Morph and Frequency offset the cutoff point of the lowpass filter. The resonant peaks moderately increase the gain, making this cube useful with the full level outputs of Eurorack oscillators. Distortion setting above +2.5V will overdrive signals.

Frequency: Controls overall frequency.

Morph: Controls the position and extent of resonant peaks.

Transform: In the default filter, Transform Controls Distortion.

C135 SweepHiQ1.4

This cube is two overlapping resonant filter systems. One system of two peaks is tuned with the Frequency parameter. The group of all six peaks (including the first system) is modulated with the Morph parameter. Attenuating the input and increasing the Distortion parameter renders intense feedback-like ringing. Switching off the Distortion mode can extend the range of the filter peaks.

Frequency: Tunes and transforms resonant peaks around 120Hz and 340Hz to narrowly spaced peaks at 1500Hz to 15kHz.

Morph: Sweeps from peaks around 150Hz, 430Hz, 870Hz, 1500Hz, 3000Hz and 7000Hz to peaks an octave higher.

Transform: In the default filter, Transform Controls Distortion.

C136 V>FcQuad.4

This cube is a highly resonant lowpass filter with an extremely steep slope. It's designed for modulation of filter cut-off where 1V/Oct CV from a keyboard or sequencer value is tracked by the Full Range CV input and an envelope modulates the Morph parameter. This creates a keyboard/sequencer tracked lowpass gate.

Frequency: Tracks 1V/Oct for use with a sequencer or keyboard.

Morph: Adjusts the cutoff frequency.

Transform: In the default filter, Transform Controls Distortion.

C137 Nexus.4

By default, Transform is assigned to Distortion amount. Setting Xform Controls Dist'n to Off allows you to use the Transform control to extend the passband range, which is useful for more gentle filtering.

Frequency: Controls the cutoff frequency of the filter. Frequency also gradually increases the amount of resonance at the cutoff frequency.

Morph: Moves from a very steep lowpass to higher frequency, gentler slope response.

Transform: In the default filter, Transform Controls Distortion.

C138 Krators.4

The series of resonant peaks forms the shape of craters in the frequency response curve. The peak shape signals into "throaty" or hollow tones. The frequency control is fairly limited in range, which makes it useful for gentle dynamic changes in brightness. Morph control over resonant peaks can range from gentle to extreme, so it's recommended to attenuate incoming signals.

Frequency: Controls brightness.

Morph: Provides resonant peaks at low-frequencies, morphing from lower to higher frequency.

Transform: In the default filter, Transform Controls Distortion.

C139 Harmonix.4

Use a quantized 1V/Oct sequence to modulate the Frequency at the Full Level input to create melodic overtones of a Sawtooth or a Square Wave drone passing through this cube. Morph changes the response in a musically pleasing manner that sweeps from low to high frequency emphasis.

Frequency: Controls the overall frequencies of the peaks and notches. Calibrated for 1V/Oct tracking at the Full Level input.

Morph: Morphs between complex responses sweeping mid frequency resonances while leaving the upper and lower boundaries untouched.

Transform: In the default filter, Transform Controls Distortion.

C140 GreenWorld.4

This cube was originally designed for shaping piano-like tones. The Morph parameter will track a 1V/Oct pitch voltage while the Frequency will follow an envelope signal that shapes the dynamics.

Frequency: Modulate to create dynamics.

Morph: Controls frequency, with 1V/Oct tracking at the Full Level input.

Transform: In the default filter, Transform Controls Distortion.

C141 Comb/Swap.4

This cube creates a useful series of harmonic resonant peaks that track 1V/Oct tuning. Chain or mult a Keyboard or Sequencer CV into the Full Level input and the source oscillator. Distortion is assigned by default on the Transform control. Disable distortion and use the Transform parameter to modulate the strength of the comb filtering effect.

Frequency: Controls brightness and tracks 1V/Oct at the Full Level input.

Morph: Controls a series of notches moving from around 160Hz to 10kHz.

Transform: In the default filter, Transform Controls Distortion. Use the Transform parameter to modulate the strength of the comb filtering effect.

C142 Comb/HP.4

The combination of a comb filter and a high pass filter provides interesting harmonic highpass sweeps. The Frequency parameter is the primary cutoff control, but when used in conjunction with a sequencer or keyboard, 1V/Oct signals should be patched into the Morph CV input. Envelope signals should modulate the Frequency input.

Frequency: Sweeps between a series of low frequency notches to a highpass response.

Morph: 1V/Oct Tracking and brightness control.

Transform: In the default filter, Transform Controls Distortion.

C143 Swirly

This cube consists of a series of notch filters that can follow 1V/Octave sequencer or keyboard CVs. This is useful if you wish the harmonic character to move with the pitch of an oscillator. Routing an LFO to the Morph CV input renders the "Swirly" effect in the patch title as the notch filter separation is modulated.

Frequency: Controls Center Frequency and tracks 1V/Octave at the Full Level input.

Morph: Modulates the structure of the notches.

Transform: Alters the timbre of the effect and adds gain.

C144 Cavatate.4

Emphasizes frequencies from around 160Hz to 2kHz with a fairly heavy broadband gain boost. Morph alters the response to a highpass filter. Applying heavy distortion results in some interesting clipping artifacts.

Frequency: Narrow center frequency control.

Morph: Transitions from a wide bandpass to a modified high pass response.

Transform: In the default filter, Transform Controls Distortion.

C145 GentleRez.4

A series of unevenly spaced resonant peaks converge to a single peak as Morph is increased. Frequency provides a somewhat muted sound (with several gentle bumps in the mid-frequency range), moving toward a flat response. Sweeping this cube produces some very smooth wa-wa effects. Using this filter with the brass-like waves can produce sounds suggestive of French Horns.

Frequency: Alters the center frequency of filter peaks.

Morph: Controls the frequency of the primary resonant peak as well as adding high frequency peaks.

Transform: In the default filter, Transform Controls Distortion.

C146 Bendup/Swap

This complex filter features several series of tuned resonant peaks and notches which can seem to bend up or down in pitch depending on the settings for the various Morph, Frequency, and Transform parameters. The overall character is a low pass filter, however peak tunings stay relatively fixed while the Transform parameter opens and closes the upper range of the frequency spectrum.

Frequency: Controls the frequencies of the peaks within a limited range.

Morph: Low values make upward filter sweeps appear to bend pitch up. High values make pitch bend appear to go down.

Transform: Higher values increase both lower and higher frequencies.

C147 Bendup

This is similar to cube C146, except that the bend is always in an upward direction (if the Morph axis is swept in a positive direction). 1V/Octave patched to the Full Level input can be used to tune the filter over a nearly 2-octave range. Transform is used to set the cutoff point of the lowpass filter; higher values raise the cutoff point.

Frequency: Tunes the filter.

Morph: Sweeps harmonic peaks.

Transform: Increase for a brighter effect.

C148 Skweezit

This filter features a complex series of peaks and notches. Varying the Morph parameter varies the 'Q' settings for most of the peaks and notches, while sweeping the frequency and Q of the first pole. This is an interesting substitute for a typical four-pole low pass; the low frequency range tunings are round, but the higher frequency range is more aggressive than a typical resonant low pass.

Frequency: Controls the cutoff frequency

Morph: Morphs from a gentle lowpass to one high peak at the cutoff frequency and multiple lower peaks at higher frequencies.

Transform: Controls the height of the resonant peaks.

C149 Lo/High.4

A scattering of poles and zeros with fairly high resonances produce this very resonant filter. Sweeping the Frequency axis produces quite pronounced wa-wa effects in which multiple resonances are clearly audible.

Morph and Frequency can be used to tune the filter, although with Frequency set to max, the filter is essentially flat. Inputting 1V/Oct sequence or keyboard CVs into the Full Level input provides useful musical results.

Frequency: Positive values raise pole/zero frequencies and decrease 'Q', eventually resulting in a flat response.

Morph: Shifts the frequencies and shapes of the peaks.

Transform: In the default filter, Transform Controls Distortion.

C150 SubtleMove.4

Morphing this filter to reverse the polarity of a series of more-or-less evenly spaced peaks and notches produces an effect more subdued than some other types of filter sweeps. Modulating the Morph parameter can be useful when developing responsive plucked-string instrument sounds. A subtle LFO sweep of the Morph parameter renders some interesting harmonic shifting resonance patterns, especially when a generous amount of distortion is applied.

Frequency: Controls the frequencies of the peaks/notches.

Morph: Transitions between peaks and notches.

Transform: In the default filter, Transform Controls Distortion.

C151 BuzzyPad.4

This filter has the general characteristics of a lowpass filter with slight resonance. It produces a bump around 65Hz and a rolloff above 250Hz at low Morph values. Increasing the Morph value pushes the bump up to about 2kHz, and the cutoff of the lowpass filter up to 20kHz. The effect of sweeping the Morph axis is similar to that of a classic 2-pole lowpass filter with medium resonance.

Frequency: Controls the cutoff frequency.

Morph: Controls the cutoff frequency.

Transform: In the default filter, Transform Controls Distortion.

C152 Bw5kHz+6.4

This is a gentle lowpass filter with a resonant peak independently controlled by Morph. The sonic result of modulating Morph is quite dramatic.

Frequency: Controls the cutoff frequency.

Morph: Controls the frequency of the resonant peak.

Transform: In the default filter, Transform Controls Distortion.

C153 Bw65Hz/2k.4

This filter is similar to C167 SynthWow4, but in addition to sweeping the bandwidth of a single peak along the Morph and Frequency axes, the peak itself is swept. The range of the frequency sweep is one octave along either axis, although much greater ranges of change are achieved when both the Morph and Frequency values are combined.

Effects range from gentle, analog-style filter sweeps (with the Frequency parameter set low), to more 'digital' sounding effects in which high-pitched, whistling harmonics are produced.

Frequency: Controls the frequency of the resonant peak.

Morph: Controls the shape and resonance of the peak.

Transform: In the default filter, Transform Controls Distortion.

C154 Bb80Hzbw1.4

This is a gentle lowpass filter with a subtle lower midrange bump. Morph increases the gain of this bump and modulates its center frequency.

Frequency: Controls the frequency of the filter.

Morph: Controls the width and frequency of the midrange bump.

Transform: In the default filter, Transform Controls Distortion.

C155 HighsTwist.4

The frequencies of the poles and zeros in this cube remain constant as Morph or Frequency are modulated, but the 'Q' values are modulated in a variety of ways.

The filter is closest to flat (with some emphasis in the high frequency range and a small bump at about 200Hz) when Morph and Frequency are both set to -5V. Modulating either or both of these parameters upward emphasizes more of the highs, with increased values for Frequency, rolling off the lows as well.

High distortion settings with this cube leads to some interesting overdrive artifacts when sweeping the Morph parameter.

Frequency: Modulate upward for thinner, brighter sounds.

Morph: Controls the 'Q' of the resonant peaks.

Transform: In the default filter, Transform Controls Distortion.

C156 Cubix

Morphing this cube produces a non-resonant lowpass filter sweep, while pushing the Frequency parameter in a positive direction moves the filter towards a more flat response, with a bit of subtle emphasis in the higher frequencies.

Frequency: Use to control 1V/Oct response or to set overall filter frequency.

Morph: Produces lowpass filter effects.

Transform: Controls very subtle response changes.

C157 HarmSweep.4

This cube is similar to the C146 Bendup/Swap filter, but with more pronounced resonance. With Frequency set to 0, pushing Morph higher produces a downward sweep of a series of very resonant harmonics. Set Frequency to max, however, and the sweep reverses.

Other effects can be achieved by experimenting with the interaction between these two parameters. Because of its metallic overtones, this filter can make a good choice for simulating certain percussion instruments, such as steel drums and kalimbas when used in conjunction with envelopes that modulate oscillator pitch.

Frequency: Causes a downward sweep of harmonic intervals.

Morph: Reverses Morph sweep.

Transform: In the default filter, Transform Controls Distortion.

C158 EvenCuts.4

This cube produces a series of peaks and notches in the frequency spectrum (based on the even harmonic series), which turn into small bumps when morphed. At lower center frequency values, the low frequency gain can be quite drastic.

Disable Distortion to restore the Transform control which allows for extended tuning of the harmonic series.

Frequency: Controls the frequency of the notches/peaks.

Morph: Controls the depth of the notches/height of the peaks.

Transform: In the default filter, Transform Controls Distortion.

C159 OddCuts.4

Like C158 above, this cube produces a series of notches in the frequency spectrum, but this time based on the odd harmonic series, which turn into a series of notches and moderately resonant peaks when morphed. At lower center frequency values, the low frequency gain can be quite drastic, and when used with distortion, the filter will overdrive very quickly.

Frequency: Controls the frequency of the notches/peaks.

Morph: Controls the depth of the notches/height of the peaks.

Transform: In the default filter, Transform Controls Distortion.

C160 PWMtrans.4

This cube produces a series of harmonically related notches, which become peaks as the Morph value is increased — the effect can be similar to pulse width modulation when fed with a simple sawtooth or square wave.

Frequency: Controls the frequencies of the peaks/notches.

Morph: Controls depth of the peaks/notches.

Transform: In the default filter, Transform Controls Distortion.

C161 HiEndQ.4

This filter behaves much like a resonant low-pass filter that becomes more resonant as the cutoff frequency is raised.

Frequency: Controls the cutoff frequency and high-end resonance.

Morph: Controls the cutoff frequency.

Transform: In the default filter, Transform Controls Distortion.

C162 BroadRes.4

Sweep this cube for for resonant effects. Can be used for a "waterdrop" effect on percussion. The behavior of the Frequency control renders better results with an inverted modulation source that decreases the value from a high initial Frequency setting.

Frequency: Sweeps from flat (at max value) to a wide series of peaks and notches.

Morph: Turns peaks into notches.

Transform: In the default filter, Transform Controls Distortion.

C163 ResoHose.4

This cube introduces a series of peaks spaced at octave intervals, in the range of 95Hz to 1.5kHz, and a single notch at 47Hz. This can be useful in simulating resonant ringing overtones. Increasing the Morph raises the peaks and lowers the notch.

Frequency: Controls the frequency of the resonant peaks and notch and transforms their shapes.

Morph: Controls the height of the peaks and depth of the notch.

Transform: In the default filter, Transform Controls Distortion.

C164 HeeghCube

This cube produces an extremely subtle series of peaks above 4kHz. Morph increases the gain and bandwidth of the peaks, slightly, and Frequency can be used to subtly offset the response of the peaks. Increasing the value of Transform increases the gain of the peaks without affecting bandwidth.

Because this is such a subtle filter and affects very high frequencies, it can be useful for creating shifts to drum and percussion transients, especially with a random voltage source modulating the Frequency CV input or the Transform CV input.

Frequency: Controls the frequency of the resonant peaks.

Morph: Controls gain and bandwidth of peaks.

Transform: Controls gain of peaks.

C165 NoizCube

This filter introduces some subtle peaks into the high frequency range, along with a single peak which can be swept. The effect is very subtle, except with complex oscillator sources or noise.

Routing a 1V/Octave control voltage into the Full Level input allows for interesting key tracking results that add a little emphasis to otherwise static waveforms. Use the Transform control to tune the filter to taste.

Frequency: Sets lower boundary range of the swept resonant peak.

Morph: Sweeps a single frequency.

Transform: Tunes the sweep, bandwidth, and 'Q'.

C166 VelocityTilt

For most of the frequency range, this is a simple non-resonant lowpass filter. As the Frequency value increases, the filter becomes more resonant based on the values of the Morph and Transform Controls.

While this cube is originally designed to work with MIDI velocity messages to create accent dynamics, if you have a sequencer that sends accent dynamics voltages (like an Audio Damage ADM06 Sequencer), the accent signals can modulate the Frequency CV to simulate velocity scaled filtering and dynamics.

Frequency: Controls the low-pass cutoff frequency.

Morph: Controls the response emphasis of the resonant peak.

Transform: Controls the intensity of the resonant peak.

C167 Syn Wow.4

This cube provides a resonant low-pass filter with a morphing second resonant peak. Both Morph and Frequency control cutoff frequency and alter the resonant characteristic of the secondary peak.

Frequency: Controls filter cutoff frequency.

Morph: Controls cutoff frequency and alters resonance.

Transform: In the default filter, Transform Controls Distortion.

C168 CombSweep.4

This is a comb filter effect. Morph alters the spacing of the three upper and three lower resonant peak groups. Increasing the Distortion imparts interesting feedback-type effects.

The comb filtering can have nice musical emphasis on harmonics. Modulating the Full Level input with a 1V/Oct control voltage that also controls oscillator pitch renders interesting overtones.

Frequency: Controls the frequency of the resonant peaks.

Morph: Adjusts the spacing of the resonant peaks.

Transform: In the default filter, Transform Controls Distortion.

C169 Diffuser.4

Morphing this filter upward sweeps a resonant peak up in frequency and increases low frequency response. The Frequency parameter can be used to tune the peak. Distortion will overdrive full level signals when the Transform setting is above +2.5V and Morph is around 0V (resonant bandpass range); either attenuate the input signal or decrease the internal gain and distortion settings to compensate.

Frequency: Very subtle and limited modulation of frequency response when the filter response is in lowpass modes.

Morph: Alters the response from a gentle lowpass filter to a resonant bandpass filter to a resonant lowpass filter.

Transform: In the default filter, Transform Controls Distortion.

C170 MdlySweep4

This is basically a lowpass filter with two slight resonance peaks. The secondary peak doesn't become noticeable until the Frequency value is greater than -2V. Morphing this filter alters the response of the resonant peaks and shifts their frequency.

Frequency: Controls cutoff frequency and resonant peak separation.

Morph: Shifts frequency response range.

Transform: In the default filter, Transform Controls Distortion.

C171 StrongShimr

This cube produces several deep notches in the frequency spectrum, which can be tuned or swept according to the settings and modulations of the Morph, Frequency, and Transform parameters. It has certain multi-mode filter characteristics but with an extra resonant peak that can be manipulated using Transform.

Routing slow LFOs or smoothed random voltages to all three parameters to filter a basic oscillator waveform renders interesting animated drones.

Frequency: Raising this value raises the frequency of the notches.

Morph: Raising this value lowers the frequency of the notches.

Transform: Raising this value producing a strong high resonant peak.

C172 Acc.Vel-1

Modulate frequency to create velocity response effects. Set Morph to establish starting point.

NOTE: *This cube will distort very easily with full-level signals. Patch the input through an attenuator, VCA, or mixer to be able to set an appropriate level without distortion.*

Frequency: Controls the cutoff frequency and slope.

Morph: As value is increased, increases high-frequency response and decreases low-frequency response

Transform: Controls volume and high-frequency response.

C173 Acc.Vel-2

This is a variation of "Acc.Vel-1" above, except somewhat brighter on bottom and mellower on top.

NOTE: *This cube will distort very easily with full-level signals. Patch the input through an attenuator, VCA, or mixer to be able to set an appropriate level without distortion.*

Frequency: With Morph at "0," controls the cutoff frequency and slope.

Morph: As value is increased, increases high-frequency response and decreases low-frequency response

Transform: Controls volume and low-frequency response.

C174 Vel2-Wind

Another velocity response cube. Good for wind instrument-type patches, as more Morph gives a "hollower" soft sound. Modulate frequency to create the velocity response effect. Set Morph to establish the starting point.

Frequency: With Morph at "0," controls the cutoff frequency and resonant peaks.

Morph: As value is increased, increases high-frequency peaks and decreases low-frequency response

Transform: Controls volume and high-frequency response.

C175 Harmo

In this cube, resonant peaks are spaced in a manner that renders interesting harmonics. Routing a quantized 1V/Oct signal to the Full Level input to control the main tuning scales the output resonance in a musical manner. Routing envelopes to the Morph and Transform CVs can create interesting tuned percussion tones.

Frequency: Controls the overall frequency.

Morph: Changes from comb-filter with lowpass response to smooth lowpass.

Transform: Controls the intensity of resonant peaks along with high-frequency response.

C176 Start>EndA

This filter is similar to C175 Harmo, but darker and smoother. As described in the C175 Comments, envelope and quantized V/Oct sequences are also a good way to create harmonically modulated percussion riffs.

Frequency: Controls overall frequency.

Morph: Complex peak at 80Hz to a very gentle lowpass response.

Transform: Alters the response from a lowpass to a resonant bandpass filter.

C177 Start>EndB

This cube is similar to C176 Start>EndA, but has more of a peak/high pass response. While it can be transformed to low pass, this changes to a series of resonant peaks in the lower part of the spectrum. The resonant peaks are tuned in a way that provides a dissonant response.

Frequency: Controls overall frequency.

Morph: Transitions between flat response and gentle lowpass.

Transform: Controls high-end peak.

C178 MovingPick1

This filter is designed to simulate the frequency response of acoustic and electric guitars when plucking closer or further from the bridge of the guitar. Use a pulse wave as a source and route a transient curve from function generator (like a Control Forge) or envelope generator to modulate the Morph CV.

Frequency: Controls the overall frequency

Morph: Controls the "pick position."

Transform: Controls volume and high end.

C179 MovingPick2

This is variation on C178 MovingPick1 which also simulates different guitar picking, but with a wider passband range for fuller tones. Morph controls the response of the location of the pick as it moves closer to neck, further from bridge.

See the C178 MovingPick1 comments for a suggested setup.

Frequency: Controls the overall frequency

Morph: Controls the "pick position."

Transform: Controls volume and high end.

C180 Mph+Trns1

This cube is primarily a formant filter that can simulate vocal vowel shapes. The algorithm has a fairly fixed response range and the Frequency control only applies subtle changes, but adjusting the Morph and Transform parameters will fine tune the formant response.

The resonant peaks do apply quite a bit of gain to incoming signals. Either attenuate the incoming signals or adjust the internal gain settings to find the right balance to prevent overdrive effects.

Frequency: Modulates the formant response.

Morph: Makes vowel like changes.

Transform: Controls brightness, volume, and subtle vowel characteristics in combination with Morph.

C181 O>Odds

Morphs from near flat to peaks at odd harmonics. Transform morphs from lowpass to flatter with peaks.

Frequency: Controls peaks.

Morph: Controls frequencies of peaks.

Transform: Controls brightness and volume.

C182 Comb Voices

Center frequencies of the poles and zeros in this filter can move in opposite directions as the filter is modulated along any of its axes, producing an amazing variety of possible curves. Sweeping the Morph axis produces some lovely phase-shifter/flanger-type effects, especially with the value for Transform set fairly high.

Frequency: Controls the overall frequencies of the notches.

Morph: Controls the spacing of the notches. Use this to animate the comb-filtering effect.

Transform: Controls high-frequency cutoff.

C183 Odd-Ev Hrm

A series of peaks and notches based on the odd and even harmonic series. Sweeping the Morph axis produces some lovely comb filtering effects, which can be either subtle or dramatic depending on other settings (especially that of Transform).

Frequency: Controls the overall frequencies of the peaks and notches.

Morph: Use this to sweep the peaks/notches.

Transform: Controls resonance of individual peaks.

C184 OddHrm+rez

This cube, based on the odd harmonic series, provides a number of comb-filtering effects. Use Morph to control filter 'Q', and Frequency and Transform to tune the filter.

Frequency: Controls the overall frequencies of peaks.

Morph: Increasing this parameter pushes the filter towards a flat curve.

Transform: Controls resonance of individual peaks. Higher values add a high-frequency bump.

C185 EvnHrm+rez

This cube is nearly identical to the OddHrm+rez filter above, but it's based on the even harmonic series. The overall effect is quite similar, though somewhat less 'hollow' sound at certain settings.

Frequency: Controls the overall frequencies of peaks.

Morph: Increasing this parameter pushes the filter towards a flat curve.

Transform: Controls resonance of individual peaks. Higher values add a high-frequency bump.

C186 MellowPeaks

This cube provides two or three mildly resonant peaks which can be swept through the frequency spectrum in a number of ways, depending on the settings of the various parameters. With lower settings of Frequency, the filter takes on a distinctly vocal quality on most source material.

Frequency: Positive values move the poles upward in frequency.

Morph: Positive values generally move the poles upward in frequency.

Transform: Transitions between a lowpass filter response and a flatter response with a marked boost in the high frequencies.

C187 AHmBnd.4

Morph will sweep a cluster of highly resonant peaks, producing a pitch-bend like effect. The effect is generally most pronounced with Frequency set to a fairly low value.

Frequency: Controls the overall frequencies of the peaks.

Morph: Sweeping produces 'pitch-bend' effect.

Transform: In the default filter, Transform Controls Distortion.

C188 Vintage

Provides basic lowpass filtering, plus a series of notches which can be swept via morphing. The most dramatic resonant sweeps are produced with Frequency set to minimum and Transform set to maximum, producing the classic analog filter sweep sound.

Frequency: Controls the presence of the notches.

Morph: Controls the cutoff frequency of the lowpass filtering.

Transform: Controls the cutoff frequency of the lowpass filtering.

C189 MildQPole

Frequency: Controls the cutoff frequency of the lowpass filtering.

Morph: Provides subtle control of the cutoff frequency.

Transform: Controls the filter slope and amount of resonance.

C190 Bonk>CO

A series of highly resonant peaks alternating with notches are spaced at intervals of about an octave. The Morph parameter is used to control 'Q' — modulating the Morph upward causes the curve to flatten out. Frequency can be used to shift the peaks/notches; higher values move the peaks/notches into higher frequency ranges. Transform also tunes the filter, but higher values cause the notches to move down in frequency, slightly. The overall effect of the filter can be very vocal, depending on the source material.

NOTE: *Will distort with some full level inputs. Patch in through attenuator or VCA to control input level.*

Frequency: Controls the overall frequencies of the peaks and notches.

Morph: Controls resonance. -5V for max. +5V for flat.

Transform: Subtly controls frequency of the peaks and notches. Higher values also boost the highs a bit.

C191 Speaker

Groups of unevenly spaced bumps and dips in the frequency spectrum are used to simulate a number of speaker cabinet responses. Use Morph, Frequency, and Transform to vary the tuning and depth of the bumps and dips to simulate different speaker cabinet types.

All Axes: Vary center frequency and amount of boost/cut for the various filter bands.

C192 Expander

Frequency and Transform provide a range of fairly broad-band boosts and cuts at various frequencies, with higher values generally providing thinner, brighter sounds. These can be used to add a measure of expressiveness to melodic source material — route 'pitch CV to Frequency, for example, and whatever CV is providing "velocity" control Transform. Increasing the value for Morph has the effect of flattening the curve, providing you with a filter depth control.

Frequency: Morphs between various configurations of peaks.

Morph: Transitions from high peaks to gentle lowpass at max.

Transform: Transitions from generally flat to highpass with peaks at max.

C193 Separator

This cube features three inharmonically related resonant peaks, which can be swept via the Morph parameter, producing a metallic set of overtones. Applied to noise, this can sound like whistling wind; applied to pitched sounds, it can produce anything from a hollow, metallic resonances to accentuated high-frequency attack transients.

Frequency: Controls the overall frequencies of the peaks.

Morph: Adjusts the spacing of the peaks.

Transform: Controls high frequency response.

C194 MildPolSwap

Basically, a variable cut-off low pass filter.

Frequency: Controls cutoff frequency and slope.

Morph: Subtly adjusts cutoff frequency.

Transform: Increases cutoff frequency and steepens slope.

Distortions

Jump Back! Transform is used to control the distortion filters.

C195 PoleCross.4

Crossing peaks produces certain "hot" or "sweet" spots where frequencies correlate. Adjust distortion with Transform.

Frequency: Controls the overall frequencies of the peaks.

Morph: Crosses filter peaks to create hot (distortion) or sweet spots.

Transform: In the default filter, Transform Controls Distortion.

C196 ApDistB6.4

Mad clipping. Reducing the Gain parameter in the filter will not only reduce the volume level, it will also reduce the amount of distortion effect.

Frequency: Controls the clipped frequencies.

Morph: Also controls the clipped frequencies.

Transform: In the default filter, Transform Controls Distortion.

C197 Dave'sRave

A whole bunch of closely spaced peaks and notches.

Frequency: Controls the overall frequencies of the peaks and notches.

Morph: Controls the locations of the peaks and notches.

Transform: Controls the heights and depths of the peaks and notches.

Vari-Pole Filters

This group of lowpass filters all have a variable slope. Variable slope filters are very rare in synthesizers (except, of course, in the Rossum **Evolution** Variable Character Ladder Filter module), but the effect of the variable slope occurs in natural sounds. The number of poles relates to the maximum steepness of the filter.

C198 Poles 1-7

Frequency: Controls cutoff frequency; range is from approx 20Hz-20kHz.

Morph: Low values produce 1 pole filter; high values produce 7 pole version.

Transform: Higher values increase resonance.

C199 2 Poles

A two pole lowpass filter with independent control of each pole's resonance.

Frequency: Controls cutoff frequency; range is from approx 20Hz-20kHz.

Morph: Higher values increase resonance for a single pole.

Transform: Higher values increase resonance for both poles.

C200 4 Poles A

A useful filter for bass sounds. Set Morph and Frequency to +5V and Transform to -5V for flat response.

Frequency: Controls cutoff frequency; range is from approx 20Hz - 320Hz.

Morph: Controls cutoff frequency; range is from approx 320Hz-20kHz.

Transform: Higher values increase resonance.

C201 4 Poles B

Another 4 pole lowpass filter.

Frequency: Controls cutoff frequency; range is from approx 20Hz-20kHz.

Morph: Higher values flatten response.

Transform: Controls slope. Higher values provide mild resonance.

C202 4 Poles C

And another 4 pole lowpass filter with variable slope.

Frequency: Controls cutoff frequency; range is from approx 20Hz-20kHz.

Morph: Controls filter slope.

Transform: Higher values increase resonance.

C203 6 Poles

A 6 pole lowpass filter with variable slope.

Frequency: Controls cutoff frequency; range is from approx 20Hz-20kHz.

Morph: Higher values produce a flatter curve.

Transform: Higher values increase filter slope and resonance.

C204 Multipole

Frequency: Controls cutoff frequency in higher ranges.

Morph: Controls cutoff frequency in lower ranges.

Transform: Higher values increase slope and resonance and re-order some poles. At max, peaks tuned to octaves can be swept along the Morph axis.

Tracking Filters

These filters range from lowpass to resonant peaking filters. The Frequency parameter allows the filter to "track" specific harmonics as you play up and down the keyboard (if you're using a keyboard) or following a sequencer's CV patched into the Full Level input.

C205 Tracker

Simple lowpass filter.

Frequency: Controls cutoff frequency; range is from approx 20Hz-20kHz.

Morph: Higher values increase resonance.

Transform: Higher values increase multi-band resonance.

C206 Tracker 2

A highly resonant lowpass filter. Transform controls the amount of resonance.

Frequency: Controls the frequency of the resonant peak.

Morph: Controls the frequency of the resonant peak.

Transform: Higher values increase the gain of the peak.

C207 Tracker 3

Basically a lowpass filter with peaks tuned to a suspended chord that can be swept along the Morph axis.

Frequency: Controls lowpass slope.

Morph: Tunes the frequency of the "chord." For most accurate tracking, set CV attenuverter to max.

Transform: Higher values produce a flatter response.

C208 Tracker5ths

Like Tracker 3 above, but with the peaks tuned to 5ths.

Frequency: Controls the overall frequencies of the peaks.

Morph: Increases filter peak gains.

Transform: Transitions from lowpass to flat.

C209 InFifths.4

Similar to C 208 Tracker5ths, but with Transform set to add some tasty distortion.

Frequency: Controls the overall frequencies of the peaks.

Morph: Starts with the fundamental, and the 5th and their multiples from 65Hz through 16.64kHz attenuated by 18dB. Results in the fundamental, 5th and their multiples from 65Hz through 16.64kHz boosted by 18dB.

Transform: In the default filter, Transform Controls Distortion.

C210 HarmTracker

Lots of harmonically related peaks in this one.

Frequency: Controls the overall frequencies of the peaks.

Morph: Increases the gain of the peaks.

Transform: Shifts balance from lower peaks to upper.

Parametric Tracking Filters

These filters are set up with various combinations of peaks and notches. The Frequency parameter controls functions such as bandwidth, amount and cutoff frequency.

C211 1BndPrmtrcA

Frequency: Controls frequency; range is from approx 20Hz-20kHz.

Morph: Higher values increase bandwidth.

Transform: Values below 0 produce decrease lows; above produces a peak. Set Transform to 0 for closest to flat response.

C212 1BndPrmtrcB

Similar to C211 with more extreme peak/notch.

Frequency: Controls frequency; range is from approx 80Hz-18kHz.

Morph: Values below 0 produce a notch; above produces a peak.

Transform: Higher values increase bandwidth of peak or notch.

C213 1BndPrmtrcC

Identical to C212 1BndPrmtrcB, except that Frequency can be used to control amount of boost or cut, in addition to frequency.

Frequency: Controls boost/cut and frequency; range is from approx 80Hz-18kHz.

Morph: Values below 0 produce notches; above produce peaks.

Transform: Higher values increase bandwidth of peak or notch.

C214 1BndPrmtrcD

Very similar to C212 1BndPrmtrcB, but with sharper boosts and cuts.

Frequency: Controls frequency; range is from approx 80Hz-18kHz.

Morph: Values below 0 produce a notch; above produces a peak.

Transform: Higher values increase bandwidth of peak or notch.

C215 MultiMetricA

A series of adjustable peaks and notches tuned to octaves.

Frequency: Controls the overall frequencies of the peaks and notches; range is from approx 40Hz-20kHz.

Morph: Values below 0 produce notches, above produce peaks.

Transform: Higher values increase bandwidth.

C216 MultiMetricB

A series of adjustable peaks and notches tuned to even harmonics.

Frequency: Controls the overall frequencies of the peaks and notches; range is from approx 80Hz-18kHz.

Morph: Values below 0 produce notches, above produce peaks.

Transform: Higher values increase bandwidth.

C217 MultiMetricC

A series of adjustable peaks and notches tuned to odd harmonics.

Frequency: Controls the overall frequencies of the peaks and notches; range is from approx 80Hz-18kHz.

Morph: Values below 0 produce notches, above produce peaks.

Transform: Higher values increase bandwidth.

C218 Omni Metric

Use frequency to control whether filter produces peaks or notches (higher values produce peaks), and use Morph to tune them (higher values move them lower in frequency). Increasing Transform flattens response.

Frequency: Transitions from notches to peaks.

Morph: Controls the overall frequencies of the peaks or notches

Transform: Controls overall peak/notch height/depth.

Harmonic Shifters

These filters are designed to alter the normal harmonic relationships of instruments by radically shifting the resonant frequency bands using the Morph parameter. Frequency allows the filter to "track" specific harmonics in response to 1v/Oct VCs patched into the Full Level input.

C219 HrmncPeaks

Harmonics can be tuned using Frequency; Morph simply controls which harmonics produce peaks. Note that if Transform and Frequency are both set to -5V, little sound will be heard.

Frequency: Controls the overall frequencies of the harmonics.

Morph: At -5V, even harmonics produce peaks. At =5V, odd harmonics produce peaks.

Transform: Controls lowpass filtering; higher values raise cutoff frequency.

C220 HrmncPeaks2

Similar to C219, but with harmonics at different frequencies

Frequency: Controls the overall frequencies of the harmonics.

Morph: At -5V, even harmonics produce peaks. At =5V, odd harmonics produce peaks.

Transform: Controls lowpass filtering; higher values raise cutoff frequency.

C221 InHarMetric

The peaks and notches in this filter are spaced evenly, though not necessarily harmonically, through approximately a four-octave range.

Frequency: Controls the overall frequencies of the harmonics.

Morph: Controls the shape and width of the peaks or notches.

Transform: Controls polarity; low values produce peaks, high values produce notches.

C222 HarmShifter

A combination of peaks and notches.

Frequency: Controls the overall frequencies of the peaks and notches.

Morph: Shifts emphasis from lower harmonics to the higher harmonics.

Transform: Controls the shape and width of the peaks and notches.

C223 HarmShiftr2

Frequency: Controls the overall frequencies of the harmonics.

Morph: Shifts emphasis from lower harmonics to higher.

Transform: At -5V, harmonics produce peaks. At +5V, harmonics produce notches. 0V produces a flat response.

C224 HarmShiftr3

Harmonically related filter bands can be moved around by adjusting Frequency. Higher values for Transform increase overall filter effect.

Frequency: Controls the overall frequencies of the harmonics. Higher values slightly reduce lows.

Morph: Controls the frequencies of the harmonics.

Transform: Increases depth of peaks and notches.

C225 Phaser

Frequency: Controls polarity of the peaks and notches; below 0V yields notches, above, peaks.

Morph: Spreads all the harmonics from a single frequency to multiple frequencies.

Transform: Controls filter bandwidth; higher values are wider bands.

C226 HrmncPhaser

Morph and Frequency interact to provide a wide variety of phasing effects.

Frequency: Controls the overall frequencies of the harmonics.

Morph: Controls the spread of the harmonics.

Transform: Notches if set below 0V, peaks if above.

C227 HrmncPhsr2

Peaks and notches cross one another to produce a variety of dramatic phase shifter-like sweeps.

Frequency: Higher values increase depth of peaks and notches (at -5V, filter is flat).

Morph: Increasing values move peaks lower, notches higher.

Transform: Adjusts individual peaks and notches and overall bandwidth.

C228 Wide Bands

With Transform set low, Morphing produces a series of widely spaced notches over several octaves. Higher Transform values result in widely spaced peaks.

Frequency: Controls the overall frequencies of the harmonics.

Morph: Increases depth of notches and peaks.

Transform: Transitions between notches and peaks.

C229 New Boost

An attempt to make a more versatile version of the popular C071 B Boost.4 filter. All three parameters interact in flexible ways. Try adjusting them all.

Frequency: Transitions from substantial bass boost to flatter response.

Morph: Transitions from substantial bass boost to flatter response.

Transform: Controls high frequencies, transitioning from a gentle lowpass rolloff to flat with a high frequency peak.

Vocal Formants

These cubes are designed to simulate human vocal resonances. In these cubes, all axes control the movement between vowels. Each filter allows a slightly different type of vowel shifting control.

C230 Vowel Space2

Imparts a different vowel color to the source at each corner of the cube. No simple shifting of formant frequencies is accomplished by any of the three filter controls. When Frequency and Transform are at -5V, Morph moves from 'oo' to 'oh', while when at +5V, Morph moves from 'ee' to 'ae.' Try all the combinations.

Frequency: Shifts from 'oo' 'er', 'ah', and 'oh' to 'uh', 'ee', 'ae', and 'eh', respectively.

Morph: Sweeps from 'oo', 'er', 'ee', and 'uh' to 'oh', 'ah', 'ae', and 'eh', respectively

Transform: Shifts from 'oo', 'oh', 'eh', and 'uh' to 'er', 'ah', 'ae', and 'ee.'

C231 Vowel Space3

Imparts one of four vowel colors to the source when Transform is at its maximum. Morph moves from 'oo' to 'ee' when Frequency is at its maximum, and moves from 'ah' to 'ae' when Frequency is at its minimum. As the level of Transform is reduced, all the vowel colors regress towards the neutral "schwa" sound. Controlling Transform with a CV gives a natural vocal expression corresponding to increasing "stress."

Frequency: Shifts from 'oo' and 'ah', to 'ee', and 'ae' respectively.

Morph: Sweeps from 'oo' and 'ee', to 'ah', and 'ae', respectively.

Transform: Shifts from the neutral schwa to the above distinct vowel colors.

C232 Oh Shaper

Based on the formants for the vowel 'O'. Sweep Frequency for some interesting vocalizations.

Frequency: Controls the overall frequencies of the harmonics. Sweep for vocalizations.

Morph: Higher values increase bandwidth of peaks and notches.

Transform: Low values produce notches, high values produce peaks.

C233 Ah Shaper

Like C032, but based on the formants for the vowel 'ah'. Sweep Frequency for some interesting vocalizations.

Frequency: Controls the overall frequencies of the harmonics. Sweep for vocalizations.

Morph: Higher values increase bandwidth of peaks and notches.

Transform: Low values produce notches, high values produce small peaks.

C234 Oo Shaper

Based on the formants for the vowel 'Oo'. Sweep Frequency for some interesting vocalizations.

Frequency: Controls the overall frequencies of the harmonics. Sweep for vocalizations.

Morph: Higher values increase bandwidth of peaks and notches.

Transform: Low values produce notches, high values produce small peaks.

Instrument Formant Filters

These filters are to simulate the resonant characteristics of various types of instruments. The Frequency parameter sometimes allows the filter to track specific harmonics, although this may not normally occur on real acoustic instruments. The subcategories of instrument formant filters are in the following order: Keyboards, Strings, Plucked, Wind, Brass, Percussion.

C235 FrmntShaper

Filter bands are based on formants.

Frequency: Controls gain and frequency of peaks and notches.

Morph: Controls bandwidth of peaks and notches.

Transform: Controls high frequency response.

C236 Piano LP.4

Designed to work a little better than a simple low pass for enhancing piano-like velocity response.

Frequency: Controls the overall frequencies of the peaks. Tracks a 1V/Oct CV at the Full Level input.

Morph: Controls the height and width of the subtle peaks at resonant frequencies.

Transform: In the default filter, Transform Controls Distortion.

C237 PianoSndBrd

Originally designed for use with a Grand Piano multisample, the filters in this cube create a variety of resonances designed to imitate the resonances of both the piano soundboard, the surrounding wood, and various mic placements. Provides fat, bass-heavy resonances, somewhat like miking a piano from the bottom.

Frequency: Adjusts the overall frequencies of the resonances.

Morph and Transform: Control the frequencies and gain on various resonances.

Max. Morph, Min. Transform: Pronounced midrange resonances, as though the soundboard was close-miked near its center without any direct string sound being picked up.

Min. Morph, Max. Transform: Lots of mid and high frequency energy, as though the soundboard was being mic'd by a contact pickup. Exhibits a pronounced electronic sound.

Max. Morph, Max. Transform: Almost pure piano sound, with only a bit of high boost starting at about 8kHz. This is the closest to the sound of the raw sample.

C238 Strike Cube

Designed for use with an Envelope or Control Forge patched to Morph to give struck or plucked tones, but there are complex interactions between all three parameters.

Frequency: Controls overall lowpass cutoff frequency

Morph: Controls resonant bumps hear the cutoff frequency and, at max, some increase in bass response.

Transform: Controls cutoff frequency, adding a high resonant peak at max.

C239 Clav Curves

A series of resonances designed to produce a clavinet-type sound.

Frequency: Controls the overall frequencies and heights/depths of the peaks and notches. Tracks a 1V/Oct CV at the Full Level input.

Morph: Controls the frequencies and gains of the individual peaks and notches.

Transform: Higher values produce brighter sounds.

C240 Symphony

A flanging cube which also gives the option of simple CV control of brightness and volume.

Frequency: Controls the cutoff frequency for lowpass filtering or the frequency region for flanging peaks and notches.

Morph: At -5V, sets cube to straight lowpass filtering. At +5V, sets cube for maximum flanging.

Transform: Controls overall volume control along with control of high frequencies.

C241 String Cube

Controls high frequency response through CV to Transform, but with the added possibility of emphasising the 2nd harmonic (first overtone) with Morph parameter, à la strings.

Frequency: Maintains harmonic filter tracking with pitch CV patched to Full Level input. Increasing the value opens up the filter to a flat response with a bump at a high frequency range.

Morph: Controls timbre change; picks out first overtone. -5V value gives a low pass filter with a bump at ~500Hz, increasing the value moves the bypass to lower frequency ranges;

Transform: Determines brightness and volume. Higher values give an almost flat response filter with a bump after ~2kHz.

C242 Swell Cube

An good cube for making swell-like pads controlled by CV. Ideal for string or or choirs-like sounds. Morph controls a balanced increase in brightness and volume and Transform offers a choice of timbres (vaguely aah to ooh).

Frequency: Maintains harmonic filter tracking with pitch CV patched to Full Level input. -5V value gives a nice low pass with a bump at around 2kHz;

Morph: Controls swell effect. A mixture of brightness and volume.

Transform: Controls timbre choice. (aah <> oohish on choir-like instruments.)

C243 Quartet.4

A variable slope lowpass filter, frequency allows control of resonance steepness around 2kHz.

Frequency: Controls filter slope and resonance.

Morph: Widens bump around 1.6kHz while reducing steepness of lowpass slope.

Transform: In the default filter, Transform Controls Distortion.

C244 Mellotron.4

Originally designed for use with strings, voices, flutes, and synth pads, this filter attenuates certain lows and low mids while boosting upper midrange frequencies to give that unnatural, tweaked Mellotron sound.

Frequency: Controls resonance frequency and steepness at higher frequency ranges after 2kHz.

Morph: Controls frequencies of peaks and notches. +5V results in flat response.

Transform: In the default filter, Transform Controls Distortion.

C245 Cello

Designed for bowed string-type sounds. Try using CV to drive Morph and/or Transform axes.

Frequency: Maintains harmonic filter tracking with pitch CV patched to Full Level input. Frequency value of +5V opens up the filter to an almost flat response with a dip at around 10kHz.

Morph: Lower values result in peaks around 100Hz, increasing the value moves the peaks closer to 8kHz.

Transform: Increase for additional brightness.

C246 Key Squeak

A gentle, warm-toned low pass.

Frequency: At low values, contains a fairly mild low pass slope with slight peaks around 400, 1200, 4000, 5200, 8800Hz opening to a flat response with slight peaks at 360, 1280, 4400, 5120 and 8620Hz.

Morph: Controls the cut-off frequency, making it possible to dial down the filter to almost nothing;

Transform: Higher values reduce filtering effect.

C247 Pluck.4

Designed for plucked string-type sounds.

Frequency: Low Pass with steep slope and two bumps at around 120Hz and 600Hz which opens to a flat response at higher values.

Morph: Controls the resonance frequency;

Transform: In the default filter, Transform Controls Distortion.

C248 Pick It

Designed for acoustic guitar-like sounds. Assign a CV to Morph to control pick placement. Assign a CV to Transform for dynamics, and a pitch CV patched to Full Level Frequency input to maintain harmonic filter tracking.

Frequency: Maintains harmonic filter tracking with pitch CV patched to Full Level input. Lower Frequency values with higher Morph values result in a metallic bell-like effect.

Morph: Controls resonance.

Transform: Controls lowpass slope. Higher values open the filter and provide a high-frequency bump.

C249 El Pick It

Like C248, but designed for electric guitar-type sounds. Assign a CV to Morph to control pick placement. Assign a CV to Transform for dynamics, and a pitch CV patched to Full Level Frequency input to maintain harmonic filter tracking.

Frequency: Maintains harmonic filter tracking with pitch CV patched to Full Level input. Higher values open up the filter from a lowpass to a more of a flat response.

Morph: Controls resonance.

Transform: Controls lowpass slope. Higher values open the filter and provide a high-frequency bump.

C250 ElGuit Cube

Designed like the Breath Control cubes to give a complete cutoff of sound in the base position. Transform gives a bright response for loud playing. Ideal for constructing brass envelopes with Control Forge.

Frequency: Moves between no sound to a flat response. Increasing the value opens up the filter from a very gentle low pass with a very low cutoff frequency to an almost flat response.

Morph: Adjusts cutoff frequency.

Transform: Controls filter slope. Provides a mild resonant bump at high settings.

C251 ElGuit Pick

Designed for electric guitar-type sounds (although will work with anything), this cube mimics the effect of pick position on timbre. Frequency is used to maintain harmonic filter tracking with pitch CV patched to Full Level input.

Minimum Morph, Min. Transform: Represents the pick position very close to the bridge with the bridge position pickup used. Timbre is sharp and trebly, with very little body in the tone.

Maximum Morph, Min. Transform: Represents the pick position far up the neck (over the fretboard). Timbre is both bassy and trebly, but there is very little body in the overall tone; sounds as though neck position pickup is being used.

Minimum Morph, Max. Transform: Represents the pick position midway between the bridge and the neck. Tone is more even and has more body; sounds as though bridge position pickup is being used.

Maximum Morph, Max. Transform: Represents the pick position nearer the base of the neck. Tone has body, but also has some high-end "singing." Determines neck position pickup used.

C252 Breather 1

An easy to adjust cube suitable for using breath control (or equivalent CV source) for the simulation of wind and brass instruments. Full effort blow gives more brightness and volume, soft playing gives mellower, quieter sound with optional timbre change with CV.

Frequency: Controls slight increase in upper register brightness and maintains some harmonic filter tracking. Frequency at -5V results in lowpass response with a large peak at around 20Hz.

Morph: Controls brightness and volume representing effort of "blow." Increasing values open up the filter to a flat response.

Transform: Changes the timbre with soft playing. Increasing values boost bass.

C253 Breather 2

Like C252 with more exaggerated volume change, less timbre change with CV. Full effort blow gives more brightness and volume, soft playing gives mellower, quieter sound.

Frequency: Determines brightness and volume representing effort of "blow." At 0V, provides a resonant peak at 300Hz that can distort with too hot an input.

Morph: Provides slight increase in upper register brightness, maintains some harmonic filter tracking. Changing the morph value also moves the resonance peak.

Transform: Determines change in timbre density on mid-power "blowing."

C254 WindNoise 1

Allows simple tuning and tracking of white noise suitable for mixing/layering with wind instrument-type sounds or just creating interesting noise-based effects.

Frequency: Controls the overall frequencies of the resonant peaks.

Morph: Controls brightness and volume.

Transform: Controls the spacing of the resonant peaks.

C255 WindNoise 2

Like C254 WindNoise 1, but with a broader, less harmonic effect. Again, as the name implies, designed for use with white noise.

Frequency: Controls the overall frequencies of the resonant peaks.

Morph: Controls brightness and volume.

Transform: Controls the spacing of the resonant peaks.

C256 Blow Cube

Another cube designed for breath-style control. Transform controls the volume and brightness and Morph controls the timbral character at all "breath" levels.

Frequency: Controls the overall frequencies of the resonant peaks.

Morph: Controls timbre change. Low values produce peaks and notches. Higher values result in smooth lowpass filtering.

Transform: Controls brightness and volume.

C257 Overblow

Designed to simulate overblown woodwind-type effects. Morph and Transform at maximum results in a flat response. Frequency and Transform at minimum results in no signal passed.

Frequency: Controls the overall frequencies of the resonant peaks.

Morph: Controls timbre change. Low values produce peaks and notches. Higher values result in smooth lowpass filtering.

Transform: Controls brightness and volume. At minimum,

C258 Wind Filter

Frequency: Moves the cutoff frequency in high frequency range.

Morph: At -5V, has a lowpass response with modest notches at \approx 3,5,6,9 and 12kHz and a peak at 1kHz. At =5V, has a flatter response with notches at \approx 200, 300, 550, 800 and 870Hz and peak at 1kHz.

Transform: Controls filter slope and high-frequency peak.

C259 FlutBreth.4

Use with noise to create the sound of breath passing over the mouthpiece of a flute. Good for creating flute-like sounds. Crank in some distortion for overblown effects.

Frequency: Controls the overall frequencies of the resonant peaks.

Morph: Peaks at around 100Hz and 1200Hz with a notch at around 700Hz transform into flat response at higher values.

Transform: In the default filter, Transform Controls Distortion.

C260 VClarinet.4

Designed to turn any sound into a clarinet, or at least simulate its breath response.

Frequency: Maintains harmonic filter tracking with pitch CV patched to Full Level input.

Morph: Patch "breath" (i.e., expression) CV to Morph to control heights and widths of resonances.

Transform: In the default filter, Transform Controls Distortion.

C261 New Mute.4

Another option for simulating the harmonic effects of brass mutes.

Frequency: Controls the overall frequencies of the resonant peaks and notches. Low values result in a highpass response with peaks at around 300Hz, 1kHz and 5kHz.

Morph: Higher values flatten filter response.

Transform: In the default filter, Transform Controls Distortion.

C262 Trempeto.4

With sawtooth input, useful for trumpet-like sounds. With other inputs, it's a lowpass with modest bumps at the cutoff frequency.

Frequency: High values move the cutoff frequency to a flat response with a bump in the higher frequency range.

Morph: With Frequency at -5V, Morph at -5V, results in a lowpass with bump at around 50Hz and cutoff before 1000Hz. At +5V, filter is flat.

Transform: In the default filter, Transform Controls Distortion.

C263 SfBrzando.4

Manipulate Frequency and Morph to produce sudden volume change effects.

Frequency: Frequency at -5V results in peaks from 20Hz until around 100Hz and again from 500Hz to 1kHz. Frequency at +5V results in a flat response.

Morph: Starts with a 12dB overall boost except for a dip at ≈ 140 Hz. At higher values, dip is reduced and boost increased after dip until flattening at 5kHz.

Transform: In the default filter, Transform Controls Distortion.

C264 UduFilter.4

Originally designed to enhance the velocity response of percussion sounds (especially the Udu). Can be used to create expressive volume effects for any percussive patch.

Frequency: Contains a single peak at 240Hz with mild roll-off of higher frequencies at low Morph offsets, becoming flatter with higher Frequency values.

Morph: Adjusts the frequency of the single peak.

Transform: In the default filter, Transform Controls Distortion.

C265 Hip Kick

A variable slope lowpass filter good for adding dynamics to bass drum-type sounds.

Frequency: Controls cutoff frequency.

Morph: Adjusts the slope of the lowpass response.

Transform: Controls a slight bump at the cutoff frequency.

C266 Cymbal Cube

Useful for simulating the response of a cymbal-type sound to changes in drumstick location.

Frequency: Controls the overall frequencies and spacing of the resonant peaks.

Morph: Modifies the peaks and notches to simulate the position of a drumstick on a cymbal.

Transform: Controls the height and depth of the peaks and notches to adjust the timbre of the cymbal.

C267 ChimeFlange

A cube for producing various bell and Gamelan-type sounds with dense, inharmonic inputs.

Frequency & Morph: Provide two different sets of peaks and notches which both raise in frequency as values are increased.

Transform: Controls peak and notch height and depth. Maximum value results in a flat response.

Miscellaneous Filters

A potpourri of unique filters that don't fit in any other category.

C268 CableRing.4

Originally designed to be used with a sampled grand piano, the Morph parameter results in a resonant sweep that ultimately goes high enough above the piano's main frequency range that the body of the piano tone comes back through; the cube simply adds a glass-like shimmer to the overall sound; a very resonant, ringing filter. Try putting Morph at maximum (resulting in a flat response) and assigning negative CV to it.

Frequency: Controls peak and notch height and depth.

Morph: Sweeps the resonant peaks. Increasing the value to +5V results in a flat response.

Transform: In the default filter, Transform Controls Distortion.

C269 TensionWire

Frequency: Controls peak and notch height, depth and position. Increasing the value widens the peaking range.

Morph: Moves peaks and accentuates lower frequencies as its value increases.

Transform: Modifies peak and notch shapes and flattens response as value increases.

C270 Auto Clang

Morphing this one puts a couple of very pronounced (and harmonically unrelated) peaks and a notch (or vice-versa, depending on setting for Transform) into the mix. Good for adding extra overtones to bell patches, but works with a variety of sounds.

Frequency: Controls the overall frequencies of the resonant peaks.

Morph: Controls resonant effect. Increasing morph value changes flat response to peaking.

Transform: Controls polarity of the peaks and notches.

C271 Dragon Claw

Useful for making adjustable horn mutes. Also works well with electric bass-type sounds.

Frequency: Tracks one set of unevenly-spaced notches from medium to medium high frequencies. Frequency at -5V results in a high pass with a bump around 100Hz and everything after 1kHz;

Morph: Controls another, lower set of unevenly-spaced notches to higher frequency notches.

Transform: Reduces overall effect of filter as amount is increased. +5V results in a flat response.

C272 Spectra

This filter can produce some fairly metallic sounds when Morph is set high and can result in distortion. Use a CV to control Morph for clangorous effects. Some interesting digital chiffs can be produced as well.

Frequency: Controls the overall frequencies of the resonant peaks. Increasing the value changes from low pass to a flat response peaking at high frequencies.

Morph: Relatively wide notches become narrow peaks as amount is increased.

Transform: Higher values increase bandwidth.

C273 RippleSheet

A subtle cube that allows control of a sound's overall spectrum.

Frequency: Transitions from lowpass to near flat.

Morph: Accentuates higher frequencies as values increase.

Transform: Attenuates lows and mids. Provides "velocity" response with transient CVs.

C274 Clear Water

A flat response cube with a little bit of increase in high frequency brightness. Provides a high frequency sheen to any sound.

Frequency: Shifts the balance of accentuated frequencies

Morph: Modulates high frequency boosts.

Transform: Flattens response at high values.

C275 Invisible

A flat response cube with subtle mid-range peaks.

Frequency: Controls the overall frequencies of the resonant peaks.

Morph: As Morph increases, boosts around 70Hz and 269Hz and cuts at 167Hz, 560Hz, and 810Hz reverse polarity; peaks become notches, and vice versa.

Transform: Flattens the response at high values.

C276 Wine Glass

Modulate Morph to get a finger rubbing a wineglass effect with a relatively pure input.

Frequency: Modifies height and depth of peaks and notches.

Morph: Moves positions and gains of peaks and notches.

Transform: Flattens the overall response, leaving only a high-frequency peak.

C277 SnakeCros.4

Very gentle lowpass affecting only frequencies above 1kHz. Morph adds subtle peaks and notches to slope.

Frequency: Controls the cutoff frequency.

Morph: Affects cutoff frequency and at higher values, adds subtle peaks and notches.

Transform: In the default filter, Transform Controls Distortion.

C278 Analog.4

Similar to C277 SnakeCros.4 but with a little bit more resonance.

Frequency: Controls cutoff frequency and slope. Adds a high peak at max.

Morph: With frequency at -5V, Morph -5V provides a lowpass response rolling off at 2.5kHz with a single peak at 44Hz. At +5V, provides a near-flat response with an 11.5kHz boost.

Transform: In the default filter, Transform Controls Distortion.

C279 Skrtch Cube

Like C241 String Cube, a good bright response from CV to Transform, In this cube, Morph offers a choice of "soft play" effects. With -5V, soft play is very mellow as normally expected. At +5V, soft play is scratchy and bright, like fingernails on a guitar string or drum.

Frequency: Controls timbre change, from mellow to scratchy.

Morph: Adjusts frequency of peaks when Frequency is at +5V.

Transform: Determines brightness and volume. At +5V, response is near flat with a high boost.

C280 KitchenSink

All sorts of stuff going on. Modulate everything. Everything interacts.

Frequency: Boosts, cuts, and adds peaks.

Morph: Boosts, cuts, adds, and shifts the frequencies of peaks.

Transform: Controls polarity and gains of peaks and notches.

12. Specifications

FILTER CUBES

289

FILTERS

1000

FILTER SEQUENCES

200

SEQUENCE STEPS

20,000 Dynamically Allocated

INPUTS

AUDIO L/R

2x 3.5mm mono socket
100k Ω Input Impedance

FULL LEVEL FREQUENCY CV

1x 3.5mm mono socket
100k Ω Input Impedance

ATTENUVERTED FREQUENCY CV

1x 3.5mm mono socket
100k Ω Input Impedance

ATTENUVERTED MORPH CV

1x 3.5mm mono socket
100k Ω Input Impedance

ATTENUVERTED TRANSFORM CV

1x 3.5mm mono socket
100k Ω Input Impedance

FILTER SEQUENCER DEC

1x 3.5mm mono socket
100k Ω Input Impedance
1.6V threshold

FILTER SEQUENCER INC

1x 3.5mm mono socket
100k Ω Input Impedance
1.6V threshold

FILTER SEQUENCER RESET

1x 3.5mm mono socket
100k Ω Input Impedance
1.6V threshold

OUTPUTS

AUDIO L/R

2x 3.5mm mono socket
1k Ω Impedance

POWER REQUIREMENTS

+/-12V (+/- 5%) via 16-pin, Doepfer-style connector

CURRENT DRAW

135mA +12V, 25mA -12V (maximum)

DIMENSIONS

18HP (W); Panel to power connector (with connector plugged in) 25mm (D)

SUPPLIED ACCESSORIES

1x 16-pin, Doepfer-style cable
4x M3 screws
4x M2.5 screws
4x Nylon washers
1x Quickstart Guide

13. From Dave's Lab: Circuit Protection

Eurorack suffers from the problem of power connector reversal. When 10 pin connectors are used, mis-insertion results in a swap of +12V and -12 V, and protection is easily accomplished using various techniques such as series diodes.

But more systems are providing the +5V supply and thus use the full 16 pin connector. When this is reversed, a diode-protected module is still safe, but the six connected ground pins in the module will short together the system's +5V and +12V supplies, potentially damaging the power supply and any modules that use +5V.

To prevent this, Rossum Electro-Music modules deviate from the standard Eurorack power connector by leaving power connector pins 9 and 10 open, rather than connecting them to ground. When plugged in backwards, this leaves the system +12V supply disconnected. Since ground is still supplied by four pins as well the chassis and any patch cords connected to the module, the dropping of these two pins has no measurable effect on circuit performance, but it means that if a Rossum Electro module is accidentally plugged in backwards, no stress is placed on the +5V supply or modules that use it.

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