Spectrum Intelligent Filter
User Guide

Welcome

Thank you for purchasing the Spectrum Intelligent Filter. The Source Audio Spectrum Intelligent Filter is the most powerful stereo filter effect pedal ever created. Building on almost 15 years of filter pedal technology and know-how, Spectrum is the culmination of Source Audio's top envelope sounds and their best thinking on how to deliver those sounds to any rig. The pedal not only features envelope filter effects inspired by the most iconic and sought-after effects pedals on the market, it also includes the option of octave tones and distortion, making Spectrum a cleverly integrated, all-in-one jam/funk machine. Whether you want to easily plug and play with its six carefully crafted factory sounds, browse the ever-growing Neuro library for additional sounds created by Source Audio and other Spectrum owners, or use the Neuro's deep sound editing tools to create your own presets, this filter pedal will satisfy the needs of any bass or guitar player.

The pedal comes in a compact and durable brushed aluminum housing with stereo inputs and outputs, a three-position toggle switch, a simple four-knob control surface, and full MIDI functionality via its USB port.

The Quick Start guide will help you with the basics. For more in-depth information about the Spectrum Intelligent Filter move on to the following sections, starting with Connections. Enjoy!

-   The Source Audio Team

Overview

Six Onboard Presets: Choose from six different onboard envelope filter effects. Vintage sounds include effects inspired by the iconic Mu-Tron© and Lovetone Meatball© pedals, as well as contemporary envelopes with thumping octave-down effects and buzzing synth-like tones.

Simple 4-Knob Control Panel: Adjust 8 different parameters with 4 knobs. Primary controls include Input Level, Modulation Depth, Frequency Starting Point, and Envelope Speed. Alternate controls (accessible by pressing the ALT button) include Envelope Sensitivity, Wet/Dry Mix, Resonance, and Output Volume.

Deep Effects Editing Capabilities: Use the Neuro Desktop Editor (free download for Mac and Windows) or the Neuro Mobile App (free for iOS and Android) to create, store, and share highly customized filter effects.

Growing Published Presets Library: Quickly test and download sounds from the ever-expanding collection of published User Presets created by Source Audio and the rest of the Spectrum Filter/Neuro Editor Community.

128 MIDI Accessible Factory Presets – The addition of a third party MIDI controller with USB host provides access to any of the pedal's 128 preset slots. Presets are also accessible with MIDI Continuous Controller (CC) messages when combined with the Neruo Hub.

25 Different Filters: Choose from a huge collection of filters including several types of low-pass, band pass, multi-pole, and phaser effects.

Dual Filter Effects: Run two different envelope filters simultaneously, each with its own envelope response and filter type.

11 Styles of Envelope Follower: Choose from 11 different types of envelope follower with adjustable attack/decay as well as ADSR triggering envelopes.

14 Different LFO Wave Shapes: Use LFO (Low Frequency Oscillators) to control filter modulation. Choose from eight different LFO wave shapes, including sine, square, sample and hold, saw tooth, and more.

13 Types of Distortion: Choose anything from a subtle drive effect to extremely fuzzy Foldback effects.

Three Modes of Operation – Use the pedal in Standard Mode for a classic stompbox experience or turn on one of the two Preset Modes and save all the knob positions.

Stereo Inputs and Outputs: Use the Neuro Editor's panning controls to route each Voice to any location in a full stereo spread. Dual inputs also allow for sidechain envelope control.

Compact Design – The durable, anodized aluminum housing has a small footprint and sturdy hardware. Dimensions: L: 4.5 in./11.4cm x W: 2.75 in./7cm x H: 2 in./5.1cm (including knobs).

Universal Bypass^{TM} – Select either analog buffered or relay based True Bypass.

MIDI Control – Connect the Spectrum to the Neuro Hub and access up to 128 presets with MIDI Program Change (PC) messages. Control many of the pedal's parameters with MIDI Continuous Controller (CC) messages or assign LFO modulation speed with MIDI Clock.

USB Port - Class compliant USB-MIDI allows the Spectrum to work as a plug-and-play device with recording software running on Mac and Windows. The USB port offers connectivity to the Neuro Desktop Editor providing access to deep editing possibilities and pedal firmware updates.

External Expression and Tap Tempo Control — Use the Control Input jack with the Source Audio Dual Expression Pedal (expression control to multiple parameters) or Tap Switch (adjust LFO rates on the fly).

Quick Start

Power

To power the unit, connect the included 9V DC power supply to the jack labeled **DC 9V** on the back panel. When running a 3rd party power supply, the Spectrum requires an isolated 9V DC power source with a minimum of 165mA and a center-negative plug.

Warning: Using a non-Source Audio supply, especially an unregulated supply, could damage the unit. Please be very cautious when using 3rd-party power supplies.

Guitar/Audio Connections

Using standard ¼" mono cables, connect your guitar, bass, or other instrument to the INPUT 1 jack and your amp (or the next audio device in the signal chain) to the OUTPUT 1 jack. When running a stereo rig, also use Input and Output 2.

Once the power and audio connections have been made, the Spectrum is ready to play.

Brief Knob, Footswitch, and Button Descriptions

Please note that all of the knobs control two different parameters. To access the alternate parameters (SENSE, MIX, RES, and VOL – printed with white graphics), press the **ALT (Alternate Function)** button located on top of the pedal. Upon pressing the ALT button the ALT LED (small LED on the top face of the pedal) will begin to blink indicating the accessibility of the Alternate knob parameters. The secondary parameters will remain accessible while adjustments are being made

then automatically switch back to the primary parameters five seconds after the last knob adjustment.

INPUT/SENS Knob: A dual function knob that adjusts the level of INPUT signal going to the processor, and also the SENSITIVITY of the envelope filter.

DEPTH/MIX Knob: A dual function knob that adjusts the modulation depth of the filter and the wet/dry MIX.

FREQ/RES Knob: A dual function knob that adjust the frequency starting point of the filter's modulation as well as the resonance of the filter.

SPEED/VOL Knob: A dual function knob that adjusts the rate of the envelope's attack and decay as well as the overall output level.

Effect Selector Toggle Switch: Use the Spectrum's three-position toggle switch and two preset banks to easily access six different presets.

Footswitch: Enables or bypasses the effect. Also, pressing and holding the footswitch from the bypassed state toggles between the first and second preset banks.

ALT (Alternate Function) Button: The small black button located on the topside of the pedal next to the CONTROL INPUT jack. Pressing the ALT button temporarily puts the pedal into Alternate Control Mode (indicated by the blinking top center LED). Alternate Control Mode switches from the Primary to Secondary function of the knobs. Also moving the center toggle switch will switch between the Green and Red Preset Banks (go to the Preset Banks section for more info).

Contents

Connections

Input Side Connections

Input 1

This is the primary input for guitar, bass, or other instruments. It can also accept line-level inputs of up to +6.54 dBV / 8.76 dBu. Connect it to your instrument or other audio source using a mono (TS) ¼" cable.

Input 2

Input 2 acts as either a second audio input, the data connection for the Neuro Mobile App, or an input for both audio and Neuro Data simultaneously.

Input 2 as an Audio Input

The tip contact on Input 2 acts as a secondary input for guitar, bass, or other instruments. It is only active when the Spectrum is configured with a signal routing option that uses stereo inputs. Connect it to your instrument (or the previous effect in the signal chain) using a mono (TS) ¼" cable. By default, the Spectrum will auto-detect the routing mode. Other routing options are available using the Neuro Mobile App or Desktop Editor. For more information about stereo routing, refer to the I/O Routing Options section.

Input 2 as a Neuro App Data Input

The ring contact on Input 2 acts as a data connection for the Neuro App. Connect it to your mobile device using a stereo (TRS) ¼" cable. It can also accept simultaneous audio and daisy-chained Neuro data from another Neuro-compatible pedal in the chain, provided that a TRS cable is used. The audio signal (if applicable) will be on the tip contact of the plug, and the Neuro App data will be on the ring contact.

Input 2 accepts data from the Neuro Mobile App. Data from the Neuro Hub comes through the CONTROL INPUT port.

Output Side Connections

Output 1

This is the primary mono Output. Connect this Output to your amplifier, recording interface, or the next device in your effects signal chain using a mono (TS) ¼" cable.

Output 2

Acts as either an audio output, the daisy-chain data connection for the Neuro App, or both audio and Neuro Data simultaneously.

Output 2 as an Audio Output

The tip contact on Output 2 acts as the secondary audio output. It carries an audio signal when the Spectrum is configured with a signal routing that uses stereo outputs. Connect it to your amplifier, recording interface, or the next device in your effects signal chain using a mono (TS) ¼" cable.

Output 2 as a Neuro App Data Daisy-Chain Output

The ring contact on Output 2 acts as a data connection for the Neuro App, passing data from the Spectrum to the next Source Audio effect in your signal chain. You can daisy-chain the Neuro App data regardless of whether Output 2 is configured to output audio or not. Connect Output 2 to the next pedal's Neuro App Data input (Input 2) using a stereo (TRS) ¼" cable. The audio signal (if applicable) will be on the tip contact of the plug, and the Neuro App data will be on the ring contact. See the Daisy-Chaining Neuro Communication section for more info.

Power and Control Connections

DC 9V (Power)

Connect to the included 9 Volt DC power supply. The power supply must be regulated at 9 Volts (direct current), able to source at least 165 mA (milliamps) of current, and the plug should have a tip-negative, sleeve-positive polarity (the center tip is ground and the sleeve is power).

USB

Connect your computer (Mac or Windows) to the Spectrum's USB port (denoted by the ⚡️ icon) using a standard mini USB cable. The USB port handles communication between the pedal and the Neuro Desktop Editor or a digital audio workstation (DAW). The Spectrum will also respond to MIDI messages from an external MIDI Controller with USB host support. The Spectrum is a class compliant USB device, meaning that Mac and Windows computers will recognize it automatically. For more information about the Spectrum's USB capabilities, refer to the USB section of the User's Guide.

CONTROL INPUT Port

The 3.5 mm CONTROL INPUT Port connects to external control devices such as the Source Audio External Tap Switch, Dual Expression Pedal, Neuro Hub, and Hot Hand 3 Motion Controller. For more information, refer to the External Control and Neuro Hub sections of the User Guide.

Controls

Control LED ⟶

ALT Button ⟵

INPUT/SENSE
Knob ⟶

DEPTH/MIX
Knob ⟵

Preset Selector
Toggle ⟶

FREQ/RES
Knob ⟶

SPEED/VOL
Knob ⟵

Engage/Bypass
LED ⟶

Engage/Bypass
Footswitch ⟵

INPUT/SENSE Knob

A dual function knob that adjusts the level of the INPUT signal going to the processor as well as the SENSITIVITY of the envelope filter.

- **INPUT (the Primary (Default) Parameter)**: Adjusts the volume level of the input signal. Given the reactive nature of the Spectrum's envelope followers and the varying output levels of different instruments and their passive or active pickups, it is important to set the level of input signal. For hotter, active pickups it is probably best to turn the INPUT knob down. For traditional passive pickups it will help to turn the INPUT level up. To set your Spectrum to the best possible Input level follow the INPUT CALIBRATION PROCESS below.
  - o   INPUT CALIBRATION PROCESS
    1. Turn the INPUT knob all the way down.
    2. Continuously pluck your instrument at your average plucking velocity.
    3. Slowly turn up the INPUT knob up until the center LED starts flashing red. This flashing indicates that you have reached the optimum INPUT level. Leave the knob where it is – the process is complete.
- **SENSITIVITY (the Alternate Parameter):** Adjusts how reactive the envelope filter is to the incoming signal. If you like to play hard, but still want a smoother, more relaxed envelope

filter, you should turn down the SENSITIVITY. For a sharper response to lighter playing, turn up the SENSITIVITY.

DEPTH/MIX Knob

A dual function knob that adjusts the modulation DEPTH of the filter and the wet/dry MIX.

- **DEPTH (the Primary (Default) Parameter)**: Adjusts the breadth of the filter modulation. Increasing this knob widens the movement of the filter over the frequency spectrum making the filter effect more prominent.
- **MIX (the Alternate Parameter)**: Adjusts the balance between the natural dry tone of the instrument and affected wet signal. A 50/50 mix of wet dry signal resides at roughly 12 o'clock on the knob.

FREQ/RES Knob

A dual function knob that adjusts the FREQUENCY starting point of the filter modulation as well as the RESONANCE of the filter.

- **FREQ (Primary)**: Adjusts the frequency starting point of the filter modulation. Moving this knob to the left will move the filter over lower frequencies and create a darker sound, moving the knob to the right places the filter over higher frequencies and create a brighter sound.
- **RES (Alternate):** Adjusts the resonance (also referred to as "Q") of the filter. Increasing the Resonance knob essentially boosts the height (or "level") of the frequency peaks and deepens the notches in the frequency cuts.

SPEED/VOL Knob

A dual function knob that adjusts the SPEED of the envelope attack and decay, as well as the overall VOLUME level.

- **SPEED (Primary)**: Adjusts the SPEED of the Attack and/or Decay of the envelope follower. In most cases turn this knob to the right for a quick, snappy envelope filter sound and to the left for a slower, more sweeping sound. When using and LFO (available in the Neuro Editor) the SPEED knob adjusts the speed of the filter's LFO modulation.
- **VOLUME (Alternate)** Adjusts the master VOLUME/Output of the pedal. Unity gain usually resides at around the 12 o'clock knob position.

Effect Toggle Switch

Use the Spectrum's three-position toggle switch and two preset banks to easily access six different presets.

- **First Preset Bank (Indicated by the green center LED):** By default the center toggle switch selects between three presets (TRON, DUMPLING, THRUST) stored in the first bank of presets.
- **Second Preset Bank (Indicated by the red center LED):** Pressing the ALT button on the topside of the pedal initiates a blinking pattern from the small LED on the pedal's face, indicating that the second preset bank is accessible with the toggle switch. Upon moving the toggle switch the center LED will turn red indicating the current preset is drawn from the second bank. Follow the same process to switch back to the green bank.

ALT (Alternate) Button

The small black button located on the topside of the pedal next to the CONTROL INPUT jack. Pressing the ALT button temporarily puts the pedal into Alternate Control Mode (indicated by the blinking ALT Function LED). Alternate Control Mode switches from the Primary to Alternate function of each knob. Moving the center toggle switch while the pedal is in Alternate Control Mode will change the Preset Bank.

Engage / Bypass LED

The Engage / Bypass LED above the footswitch indicates if the effect is active (lit) or bypassed (not lit). The color of this LED indicates whether the current preset is stored in the first bank (green LED) or the second bank (Red LED).

The Engage / Bypass LED also plays a role when calibrating the INPUT level. Go to the INPUT/SENSE Knob section of this manual for instructions on calibrating the INPUT level.

Alternate Function LED

The small LED located between the INPUT and DEPTH knobs is the Alternate (ALT) Parameter LED. Pressing the ALT button puts the Spectrum into Alternate Parameter and Bank Switching mode, indicated by the blinking LED. If a period of 6 seconds passes without moving any knobs or the toggle switch, the Alternate Parameter LED will stop blinking and the knobs will return to their primary parameter.

The Alternate Function LED also indicates (when lit solid/not blinking) that external control mode (expression, hot hand, or MIDI) is active.

Footswitch

Enables or bypasses the effect. The footswitch is also used to toggle between the first (green LED) and second (red LED) Preset Banks. Go to the Accessing the Green and Red Preset Banks section of this manual for more info on changing Preset Banks.

The Spectrum Filters

Out of the box the Spectrum offers six expertly crafted filter effects. Select each filter with the three-position Effect Toggle Switch. See the Accessing the Green and Red Preset Banks section for instructions on changing between preset banks.

- **Tron (Green Bank – Left Postion)**: Inspired by the timeless filter tones of Jerry Garcia, Bootsy Collins, and Stevie Wonder, the Tron filter is our take on the coveted Mu-Tron III© of 1972. It uses a lower resonance low-pass filter, and dynamically responsive envelope.
- **Dumpling (Green Bank – Center Position):** Another nod to an envelope filter trailblazer, *Dumpling* is inspired by the Lovetone Meatball© of the mid 90's. These higher resonance, low-pass filter sounds can be heard on recordings by The Edge, Kirk Hammett, Mike Gordon, and Ed O'Brien. It works especially well with bass guitar.
- **Thrust (Green Bank – Right Position):** Fatten up your sound with this Thrust! It includes emulation the monophonic analog tones of the OC-2, when paired with a *Notch, Low-Pass, Peak* filter, modulated by a quickly attacking and decaying envelope.

- **Punch (Red Bank – Left Position):** This punchy band-pass filter option is perfect for slap bass, staccato finger style funk, and plucky guitar solos. Cut through the mix with thick tone and quick response via the *Fast Attack* envelope.
- **Vocal Synth (Red Bank – Center Position):** Dry signal mixed with gated fuzz and a monophonic octave down go through the *3-Stage Phaser* filter for a growly, vocally synth. With detailed dynamic sensitivity, playing feels just as immediate and responsive as when playing clean. Mix in polyphonic passages for wobbly and unpredictable sound effects.
- **Octave Lead (Red Bank – Right Position):** Our thickest default Spectrum sound lends itself well to lead lines and solos. Dry signal is mixed with an monophonic octave down and octave up, and then run through our *Peak, Notch, Low-Pass* filter controlled by the *Wide Range* envelope.

Accessing the Green and Red Preset Banks

The Spectrum can store up to six presets (2 banks of 3 presets) accessible without a MIDI controller or the Neuro Editor.

- **Green Preset Bank (Indicated by the green center LED):** By default the center toggle switch selects between three presets (TRON, DUMPLING, THRUST) stored in the first (green) bank of presets.
- **Red Preset Bank (Indicated by the red center LED):** Pressing the ALT button on the topside of the pedal initiates a blinking pattern from the Alternate Function LED on the pedal's face, indicating that the second preset bank is accessible with the toggle switch. Upon moving the toggle switch the center LED will turn red indicating the current preset is drawn from the second bank. Follow the same process to switch back to the green bank.
  Also, pressing and holding the footswitch from the bypassed state will toggle between the first (Green) and second (Red) preset banks. Note: if "Quick Bank Switch Using Footswitch" has been selected from the Neuro Editor's "Spectrum Intelligent Filter Hardware Options," it is also possible to change preset banks with the footswitch while the pedal is still engaged.

Three Different Preset Modes

Connecting the Spectrum to the Neuro Desktop or Neuro Mobile App (See the Neuro Section for more info) allows you to select between three different Preset Modes: Preset (default mode), Control, and WYSIWYG ("What You See Is What You Get"). To select which mode your Spectrum operates under, go the Spectrum's *Hardware Options* Menu (the gear icon in the Connection section) and use the *Preset Mode* menu. Each mode is universal and applies to all six presets available in the green and red preset banks.

Preset (Default) Mode

Preset Mode engages a pre-programmed preset. So upon the initial engagement of a preset the knob parameters will instantly jump to their saved values, regardless of the physical position of the knobs. Upon making a knob adjustment, the center LED will start to blink, indicating that edits have been

made. After making an adjustment you can save the new settings by pressing and holding the footswitch until the center LED stops blinking (around five seconds).

Control Mode

In Control Mode each preset engages with a pre-programmed preset, meaning the physical positions of the knobs do not affect the sound of the preset. It is, however, possible to reach down and make knob adjustments on the fly. If, after making a knob adjustment, the pedal is bypassed then reengaged without moving the toggle switch, the sound will continue to reflect the new knob positions. If the toggle switch is moved (regardless of whether the effect is engaged or engaged), the pedal will revert to the parameter settings of the saved preset.

WYSIWYG (What You See Is What You Get) Mode

In WYSIWYG Mode the Spectrum functions much like a traditional effects pedal. It is a "What You See Is What You Get" experience, meaning that the current physical positions of the knobs will indicate the settings of the primary knob functions. Note: If you move the toggle switch to a new position all the primary knob parameters will maintain the settings of the physical knob positions, but the Alternate knob functions will revert to their default settings.

Universal Bypass ™

Most effect pedals offer either true bypass or buffered bypass. The Spectrum contains two separate circuits for bypass mode, allowing you to choose the method you prefer. The true bypass path uses signal relays, which are electromechanical switches. This provides an ultra-low resistance path from the input jacks to the output jacks, which is effectively the same as a single wire. The buffered bypass path uses extremely low noise buffers, which provide very low output impedance and are effective for driving long cables or long chains of effects following the Spectrum's audio output.

Out of the box, the Spectrum operates in true bypass mode. To select a different bypass mode, open the Spectrum's Hardware Options menu in the Neuro Mobile App or Desktop Editor, then select an option from the "Hardware Bypass Mode" pull down menu.

We recommend using the bypass method best suited for your signal chain. Ideally, the first pedal in a signal chain is a buffered input followed by true bypass in the rest of the signal chain.

Both bypass methods have pros and cons associated with them. Buffered bypass provides consistent input impedance so that if the source is susceptible to variations in input impedance (similar to a guitar pickup), there won't be a noticeable change in tone. True bypass has the benefit of providing a dedicated hardwired bypass signal path. The Spectrum features small-signal relays for true bypass switching that offer reduced pops and clicks compared to the traditional true bypass switching method using a mechanical switch.

External Control

The CONTROL INPUT port opens a variety of external control options, allowing for direct control over many of the Spectrum's parameters. It is an input for the, Source Audio Tap Switch, Source Audio Dual Expression Pedal, or a data port for the Neuro Hub.

The Source Audio Tap Switch

The Source Audio Tap Switch connects directly to the CONTROL INPUT with a 1/8" TRRS cable. The Tap Switch can be used for a variety of tasks.

- **Tap Tempo**: Manually tap in the rate of the LFO. Use the *Beat Division* pull-down menu in the *LFO 1 & 2* block of the Neuro Editor to select the rhythmic subdivision of the tap tempo. The beat division options are Whole, Half, *Quarter, Eighth, Triplet, and Sixteenth* notes.

Expression Pedals

The Spectrum's effects parameters can be controlled directly by a Source Audio Dual Expression Pedal or the Hot Hand 3 Wireless Controller connected with a 1/8" TRRS cable to the CONTROL INPUT port.

Source Audio's expression pedals are configured as follows: the tip connection is power, the first ring is the X-axis expression signal, the second ring is the Y-axis expression signal, and the sleeve connection is ground.

Ground   Power

Y Exp   X Exp
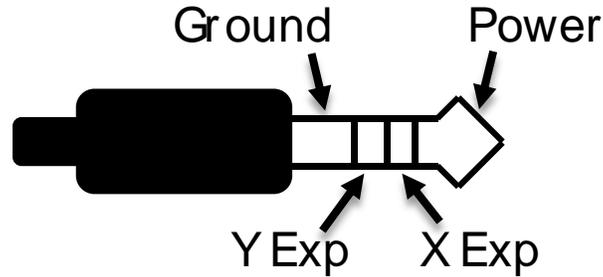
Although the CONTROL INPUT port expects a 4-contact TRRS plug, it is still possible to use a 3rd party expression pedal with a 3-contact TRS plug (Note: you should make sure the expression pedal's TRS configuration is the same as the graphic below). Use a 3-contact 1/4" to 1/8" (3.5mm) TRS plug converter - the expression pedal's output will be connected to the Spectrum's X-axis. For proper operation, the configuration steps in the next section must be followed when using any expression pedal, whether from a third party or from Source Audio.

Ground   Power
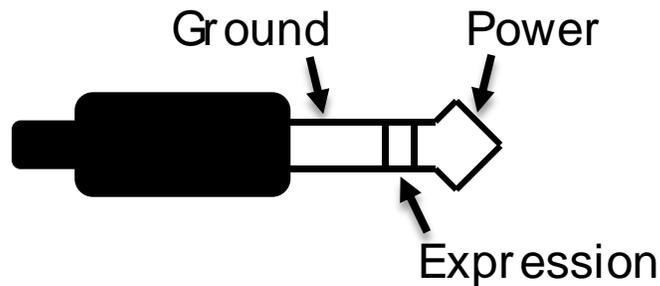
Expression

Expression pedals with TS (Tip Sleeve) plugs will not work correctly with the Spectrum.

The resistance/impedance of the expression pedal does not matter. The Spectrum will automatically adjust itself to the range of the expression pedal when it is configured.

Configuring the Expression Pedal

Use the Spectrum's Neuro Sound Editor to assign expression control to up to three parameters. Expression editing is accomplished in the External Control block of the Neuro Sound Editor. For more info on assigning expression control to the Spectrum go to the External Control section of this manual.

Hot Hand 3 Universal Wireless Controller

The Hot Hand 3 Wireless Effects Controller connects directly to the Spectrum's Control Input with a 1/8" TRRS cable and can be used to control up to three parameters. Hot Hand 3 works similarly to an expression pedal, but rather than rocking an expression treadle to move parameters, Hot Hand moves parameters with hand motions via its wireless ring. Visit the Hot Hand 3 Page on the Source Audio website for more details on HH. The Hot Hand has two axes of expression: X and Y. These signals are carried on the two rings of the TRRS cable that comes from the Hot Hand receiver.
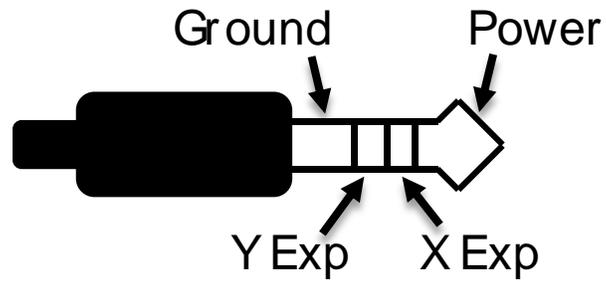
Configuring the Hot Hand

Use the Spectrum's Neuro Sound Editor to assign Hot Hand control to up to three parameters. Hot Hand expression editing is accomplished in the External Control block of the Neuro Sound Editor. For more info on assigning expression control to the Spectrum go to the External Control section of this manual.

Neuro Mobile App & Neuro Desktop Editor

The Spectrum Intelligent Filter was designed to be a simple plug-and-play effects pedal. Straight out of the box it offers six great sounding guitar/bass envelope filter effects. In addition, connecting the Spectrum to the Neuro Mobile App or Neuro Desktop Editor opens a vast library of presets created by the Source Audio team and the ever-growing community of Spectrum users. The Neuro Editor also offers a super-powerful Sound Editor for creating, saving, and sharing your own custom Presets.

Browse, Burn, and Play!!

It's just that easy. If you don't have time to dive into the Sound Editor, but you want a quick listen to the vast landscape of sounds the Spectrum has to offer, simply jump to the Cloud and check out all the available User Presets. When you find something you love, simply hit the BURN button and upload that Preset directly to your Spectrum – it will be waiting for you at the next gig. For more info on Burning Presets to your Spectrum go to the Cloud section of this manual.

The Neuro Desktop Editor

The Neuro Desktop Editor is an excellent tool for accessing, creating, and organizing Presets for your Spectrum Intelligent Filter. The Desktop offers an expanded collection of deep editing parameters, and an advanced cataloging system for naming and storing Spectrum presets. The Desktop is also a tool for installing the latest updates to your Spectrum firmware.

Downloading and Connecting the Neuro Desktop Editor

The Neuro Desktop Editor is a free download for Mac and Windows PCs. To download the Neuro Desktop, go to the Source Audio Downloads page. In the Software tab click and download the appropriate file. The latest firmware versions for the entire line of One Series pedals, including the Spectrum Filter, are included with the Neuro download. If there is trouble installing the software, select System Preferences // Security and Privacy // Open Anyways.

After the downloading process, open the Neuro Desktop Editor and connect your Spectrum with a USB Type A male to mini Type B male data cable (Warning: don't use a charger cable). Connect the

cable from the mini USB port on the pedal to the USB port on your computer. Once you've made the connection a blue box will appear in the Connections field of the Neuro interface indicating that the Spectrum is ready for editing.

If your pedal is in need of a firmware update, the Firmware Update icon (the arrow icon) will be framed in yellow. Upon clicking the arrow icon, you will be instructed on the updating procedure. (**Note:** It is important disconnect all other Source Audio pedals and turn off MIDI software during the firmware updating process.)

Neuro Desktop Editor User Interface

The Neuro Desktop's user interface features three primary sections: Connections, Preset Editor, and Presets.

Connections

The Connections section is located on the left side of the Neuro Desktop Editor. This field displays all connected One Series pedals. Each connected pedal offers the three options listed below:
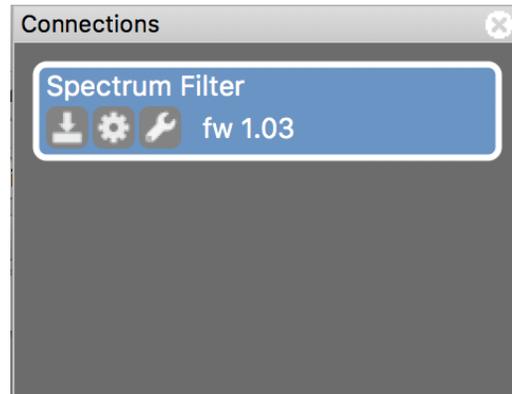
- **Firmware Updates (Arrow Icon)**: Click to download any recent firmware updates to the connected pedal. If an update is available this icon will be framed in yellow. Upon clicking the icon, the software will provide instructions on how to proceed.

- **Hardware Option (Gear Icon)**: Opens the Hardware Options window. Each Source Audio pedal has its own set of global hardware settings. The attached pedal will retain all hardware option edits until either the option is de-selected, or a Factory Reset is performed.

- **Sound Editor (Wrench Icon)**: Opens the Spectrum's Sound Editor, revealing a deep set of editing controls for creating custom presets.

Hardware Options

Clicking the gear icon in the Spectrum's Connections window opens the Hardware Options menu (see the graphic below). Use the Hardware Options window to choose your pedal's global hardware settings.
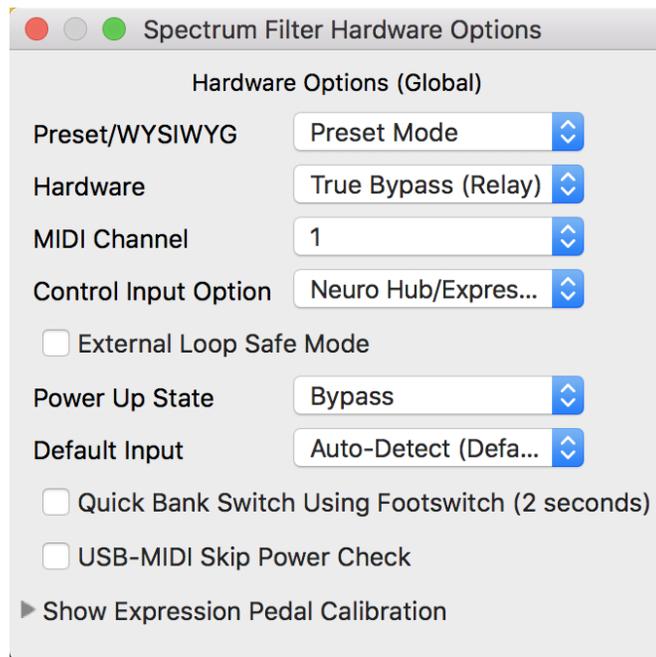
The Spectrum's Hardware Options include the following:

- **Preset/WYSIWYG**: There are three different Preset Modes available in the Spectrum: Preset (default), Control, and WYSIWIY ("What You See Is What You Get"). Use this dropdown menu to select the Preset Mode. For more info on the functionality of each mode, go to the Three Different Preset Modes section.
- **Hardware**: Selects between two Hardware Bypass Modes: True Bypass or Active Analog (Buffered) Bypass.
- **MIDI Channel**: Selects the pedal's MIDI channel (1 through 16).
- **Control Input Option**: Selects the function of the external device connected to the CONTROL INPUT port. Options include:
  - **Neuro Hub/Expression Pedal**: Enables compatibility with the Neuro Hub (which provides full MIDI functionality) or an external Expression Pedal (see details in the External Control section).
  - **Tap Tempo**: Connect the Source Audio Tap Tempo Switch to the Spectrum and sync its LFO rates with external tap tempo control.
- **External Loop Safe Mode:** Check this box when using the Pre-Processing External Loop routing option. It will prevent your effect from feeding back when engaged.
- **Power Up State:** Selects whether the Spectrum is Engaged or Bypassed during the initial power-up process.

- **Default Input:** Selects the default configuration of the Input jacks. There are four different options: Auto Detect (Default), Single Input 1, Dual Input 1 & 2, External Loop (Pre-Processing). Go to the Routing and Options section for details on all of the routing choices.
- **Quick Bank Switch Using Footswitch (2 Seconds)**: By default you can only use the footswitch to alternate between Preset Bank 1 (Green LED) and Preset Bank 2 (Red LED) from the disengaged state. Checking this box allows you to alternate Preset Banks quicker AND from the engaged state.
- **USB MIDI Skip Power Check:** The Spectrum can receive MIDI PC messages via the pedal's USB port. It requires MIDI DAW software or a MIDI host device with USB. The Spectrum should respond to most devices, but some don't generate enough power for the Spectrum to recognize them as a MIDI host (the MIDI Baby and qCONNECT from Disaster Area Designs are two examples). If your Spectrum is not responding to your MIDI host device, try checking this box.
- **Show Expression Pedal Calibration:** If necessary, open this control set to calibrate external expression pedals.

Preset Editor

Click the Sound Editor (wrench) icon in the Connections section to open the Spectrum's Sound Editor in the center tab. This is where all of the sound editing work takes place. The Sound Editor is broken into several sub-sections, each containing a unique variety of virtual knobs and dropdown menus. The following is a brief explanation of each Sound Editor sub-section.

Master Controls

The controls that populate the Master Controls section apply to all Voices in the Spectrum Editor.

- **Input 1 Gain 1 & Input 2 Gain**: Because the Spectrum's envelope followers respond differently depending on the level of signal going into the pedal and because the output levels of different instruments vary so greatly, it can be helpful to adjust the level of signal going into the effects processor. The two Input Gain controls make it possible to adjust the level from Inputs 1 & 2 independently.
- **Master Depth**: A master control for the modulation depth of Filter 1 and Filter 2. When running both filters simultaneously the Master Depth control adjust the depth of both filter to scale with their individual settings.
- **Mod Source (ENV / LFO)**: Adjusts the mixture of the modulation source. The modulation source refers to the mechanism that moves (a.k.a. "modulates") the filters. The Spectrum has two types of filter modulation: the envelope follower (ENV) moves the filter based on the

players pick attack, and the low frequency oscillator (LFO) modulates the filter back and forth at a steady rate set by the Speed control in the *LFO* section. Turning the knob all the way to the left provides 100% envelope follower control and turning the knob all the way to the right provides 100% LFO control. Setting the knob anywhere in between creates a mixture of both types of filter modulation.

- **Bass**: Boosts or cuts the low frequencies of the wet signal.
- **Treble**: Boosts or cuts the high frequencies of the wet signal.
- **Mix**: Sets the ratio between the wet and dry signal. Placing the knob at approximately 12 o'clock creates a 50/50 mixture of wet and dry signal.
- **LoRetain Frequency (WET):** Rather than a simple Mix control the LoRetain parameter allows you to split the frequency spectrum of your wet signal, meaning that the Spectrum effect applies only to the frequencies above a certain cut-off point and leaves the lower frequencies dry and unaffected. The LoRetain Frequency adjusts the point in the frequency spectrum where this split occurs. As we turn this knob from left to right the cut-off point moves to higher frequencies leaving more and more of your low frequency spectrum unaffected.
- **Output Volume**: Boosts or cuts the overall output level of both the wet and dry signals.
- **Output Balance:** Balances the level of the wet signals going to Output 1 (Left) and Output 2 (Right). Set the knob to 12 o'clock for an even stereo split to both Outputs. Turning the knob left shifts the balance to Output 1 and turning the knob right shifts the balance to Output 2.

Voice Controls

The Spectrum features two standard Voices. Each Voice can receive signal from either Mono Input 1, Mono Input 2, or Stereo Input Mix. Both Voice modules feature the same control set.

- **On**: Click the On buttons to engage or disengage each individual Voice. If the On button is green the Voice is engaged.
- **Source Pull-Down Menu**: Selects between Inputs 1 & 2 as the audio source.
- **Destination Pull-Down Menu:** Selects whether that Voice is directed to both the Distortion and Filter modules, only the Filter module, or bypasses both modules and goes directly to the Output Mixer.
- **Level Knob**: Sets the Output level of the corresponding Voice. Use each Voice's dedicated Level knobs as a mixer for the final preset.

- **Processor Pan Knob**: Directs each Voice's signal to either Processor 1 (the left side of the knob) or Processor 2 (the right side of the knob). All points between the extreme left and right knob positions route the signal to a mixture of both Processors.

Octave Controls

In addition to the two Standard Voices the Spectrum features two monophonic Octave Voices that can be added to the final mix. Each Octave Voice can be set either one octave up or up to two octaves down.

- **On**: Click the On buttons to engage or disengage each individual Voice. If the On button is green the Voice is engaged.
- **Source Pull-Down Menu**: Routes the dry signal through the Monophonic Pitch shifting module. The Monophonic Pitch Shifter applies octave effects to single note lines (a.k.a. "not chords"). Use the Interval pull-down menu to select an interval up or down three octaves.
- **Destination Pull-Down Menu:** Selects whether that Voice is directed to both the Distortion and Filter modules, only the Filter module, or bypasses both modules and goes directly to the Output Mixer.
- **Level Knob**: Sets the Output level of the corresponding Voice. Use each Voice's dedicated Level knobs as a mixer for the final preset.
- **Processor Pan Knob**: Directs each Voice's signal to either Processor 1 (the left side of the knob) or Processor 2 (the right side of the knob). All points between the extreme left and right knob positions route the signal to a mixture of both Processors.
- **Filtering Knob:** Adjusts a separate filter applied only to the Monophonic Pitch Shifting effect. Basically it works like a tone control for Monophonic Pitch Shifting effects.

Processor 1 & 2 Distortion

Adds distortion to any of the Standard or Octave Voices. The high harmonic content of added distortion will heavily accentuate the sound of the modulating filters. The Spectrum includes 13 types of distortion, anything from a subtle drive effect to extremely fuzzy Foldback effects.

Please note that it is only possible to run any or all of the four Voices through a single distortion type and that the Distortion module has only one set of master controls.

- **On Button**: Engages or disengages the Distortion module.
- **Voice Mix Monitors**: The four meters labeled Voice 1 through 4 monitor the Processor 1 & 2 ratio of each Voice through the *Distortion* block.
- **Distortion Type Dropdown Menu**: Choose from any of the Spectrum's 13 different distortion types.
- **Drive Knob**: Adjusts the amount of distortion.
- **Clean Mix Knob**: Adjusts the mix ration of clean to distorted signal. Setting the Clean Mix all the way to left offers a 100% clean mix, all the way to the right is a 100% distorted mix, and 12 o'clock on the knob offers a 50/50 clean/distorted mix.
- **Output Knob**: Adjusts the overall level of the output signal coming from the Distortion block.

Processor 1 & 2 Filters

The Filters play a crucial role in developing the character of your preset. Basically a filter boosts or cuts certain segments of a sound's frequency spectrum. Modulating these filters (a.k.a moving them up and down over the signal) creates an effect similar to many of the sounds we hear in the physical world (for example the sound of an instrument being struck or that of a human voice). The Spectrum has over 20 different Filters to choose from. At the bottom of this section you will find more detailed description of these processing blocks and the filter types.

Please note that unlike the Distortion Processor, both of the Filter Processors run independently, meaning that it is possible to run two filters simultaneously. The Filter types and parameter controls for Processors 1 and 2 will run independently of one another.

- **On Button**: Engages or disengages the Filter module.
- **Voice Mix Monitors:** The four meters labeled Voice 1 through 4 monitor the Processor 1 & 2 ratio of each Voice routed to the Filter.
- **Filter Type Dropdown Menu:** Choose from any of the Spectrum's 28 different filter types (see below for a detailed description of the filters and the response plots).
- **Invert Button:** Inverts the direction of the filter modulation. For example if a single low-pass filter is set to modulate its cut-off point from the lower frequencies to the higher frequencies, the Invert button will change the direction of the filter modulation and move it from the higher frequencies to the lower frequencies.
- **Depth Knob:** Adjusts the breadth of the filter modulation. As the Depth knob is increased, so does the frequency range over which the filter moves.
- **Frequency Knob:** Adjusts the starting point of the filter modulation. Turning the knob to the left causes the filter to modulate over lower frequencies and turning the knob to the right causes the filter to modulate over higher frequencies.
- **Q Knob:** Adjusts the intensity (also referred to as "resonance") of the filter. Increasing the Q knob essentially boosts the height (or "level") of the frequency peaks and deepens the notches in the frequency cuts.
- **Envelope/LFO Selector Dropdown Menu:** Selects whether Envelope/LFO 1 or Envelope/LFO 2 controls the filter modulation.
- **Pitch Tracking Drop Down**: Engaging the *Pitch Tracking* initiates a function where the Filter modulation and Pitch Tracking work in tandem, meaning that the filter will move its starting point in the frequency spectrum based on the note that is being played. There are three different pitch-to-filter frequency ratios: *1/3 Octave, 2/3 Octave*, and *1 Octave*. So for example, if you set your Pitch Tracking to *1/3 Octave* and play a low E then an E up one octave, the filter's frequency starting point will move up 1/3 of an octave with the higher E from where it was for the lower E. If you set the your Pitch Tracking to *1 Octave*, the frequency starting point will move up a full octave when moving from a low E to E at the next octave.

More details on the Filter Processors

Theory of operation: Internally, the Spectrum contains two independent processing blocks that perform the filtering operations. Each block has three sections, each capable of a variety of two-pole filters. These are then connected in series or parallel, with small mixers to sum as the case may be. This gives us a large variety of frequency response shapes. While the sound is, of course, determined from its frequency response, that doesn't mean it's easy to tell what something will sound like just from looking at the frequency response. Not even for us. The Frequency control for the filter moves the entire frequency response up and down in frequency, with all three filter sections moving together. When Modulation is applied, the three sections may move together or independently, with some moving up while others move down, or they may move in the same

direction, but a different amount. Unless independent motion is specified, you may assume the entire frequency response moves as a unit when modulated, without changing shape.
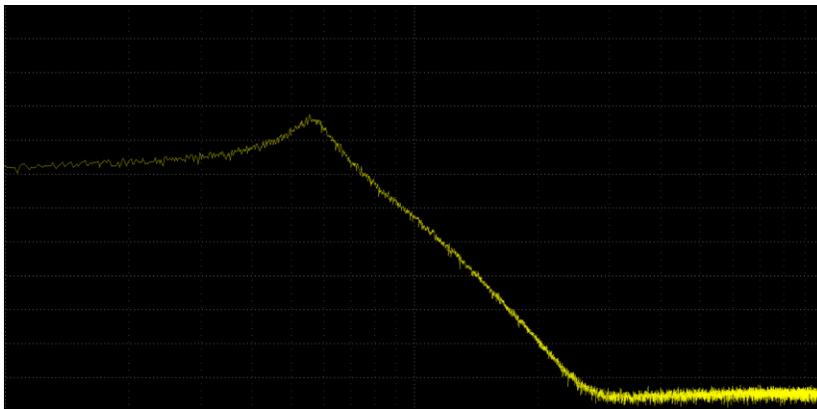
Note: It is possible to combine any of the filter types in parallel with the same envelope source. This makes essentially for endless filter types.
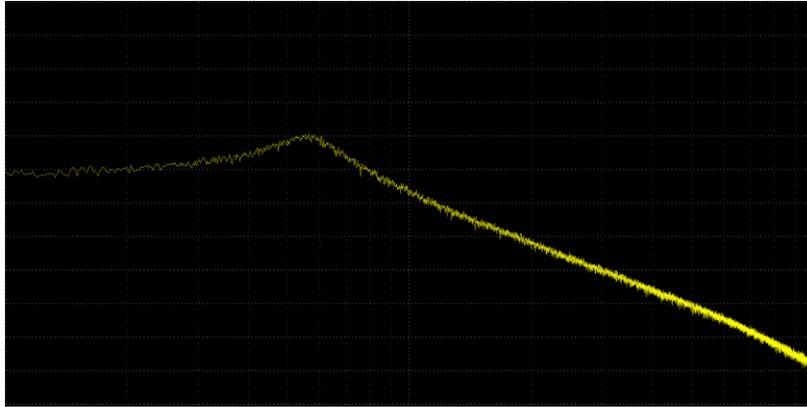
3 Pole Parallel Low Pass
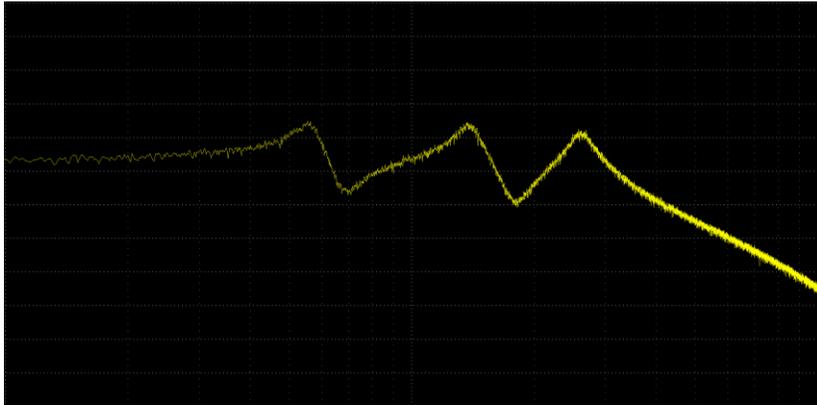
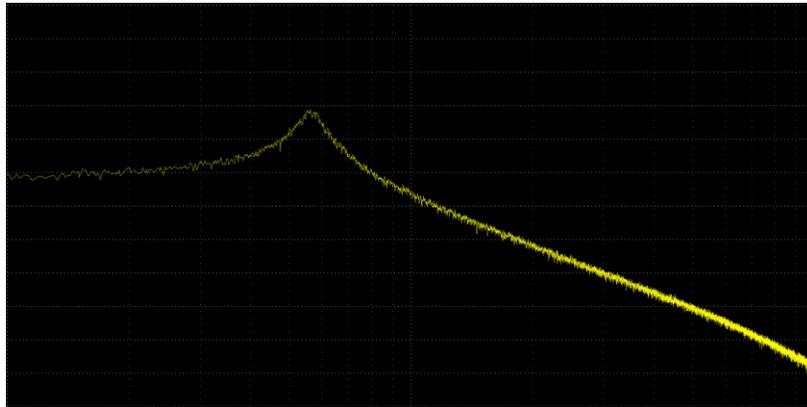**6 Pole Low Pass**

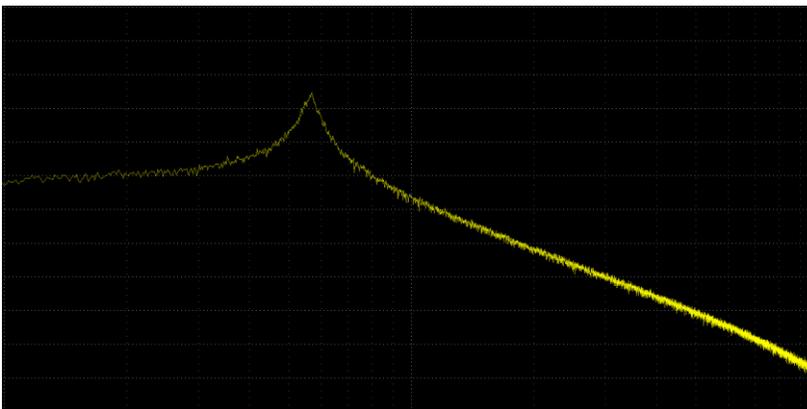Response drops at 36 dB/octave.

2 Pole Low Pass (Low Q)

A very classic filter shape. Above what is termed the cut-off frequency, the response drops, at 12 dB/octave. If the Q control is turned up at least some, there will be a resonant peak at the cut-off frequency. Higher Q's produce higher peaks.

2 Pole Low Mass (Mid Q)

2 Pole Low Pass (High Q)

Notch, Low Pass, Peak

A notch, a peak, and then a Low-Pass without any resonant peak. (The name implies they are in a different order, but that is an error.) The notch is fixed at wide, and ignores the Q control. Q controls the width of the peak. There will be a little phasery-ness to any response with a notch in it.
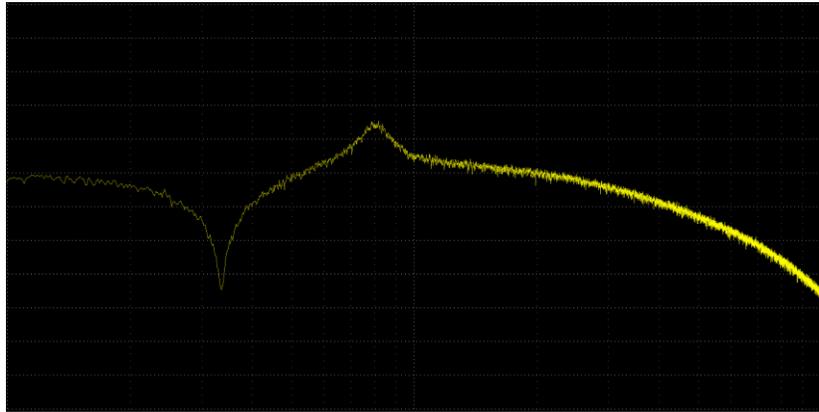
Notch, Notch, Low Pass

Two notches and then a Low-Pass.
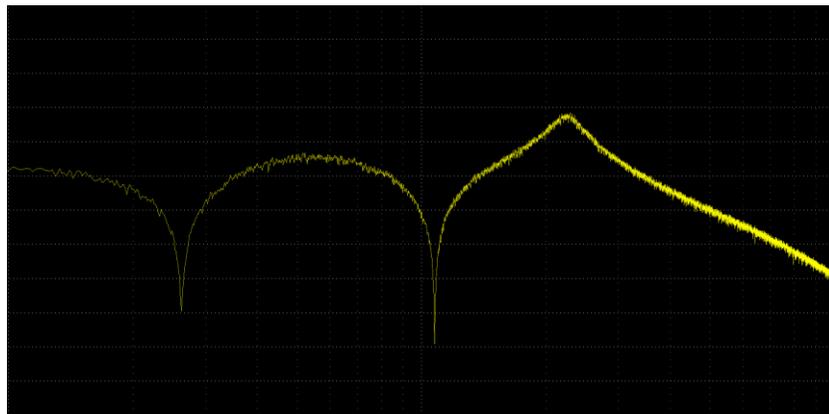
Peak, Notch, Low Pass

A peak, followed by a notch, and then a Low-Pass. If a peak is present in a filter, and if Q is set to the minimum, the peak becomes so wide that it tends to wash out any other structure, and will sound less interesting.
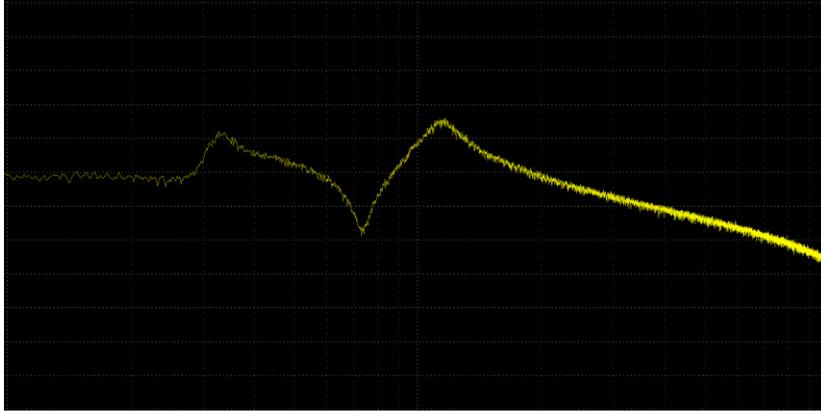
Low Pass, Peak, Peak

Two pole Low-Pass has two Band-Passes summed at higher frequencies. Independent motion.
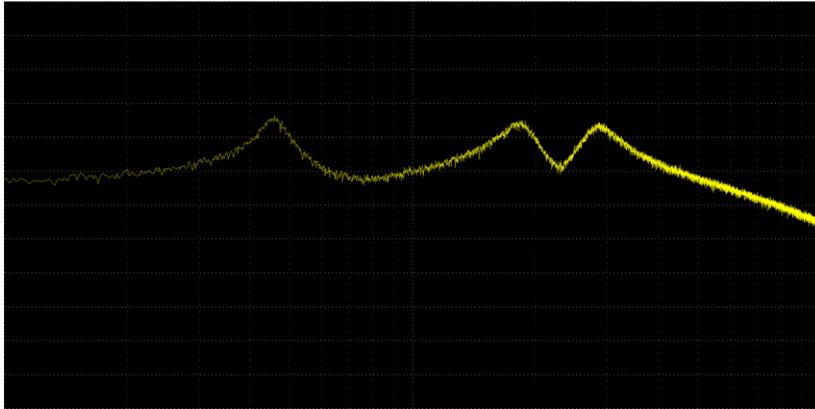
2 Parallel Low Pass
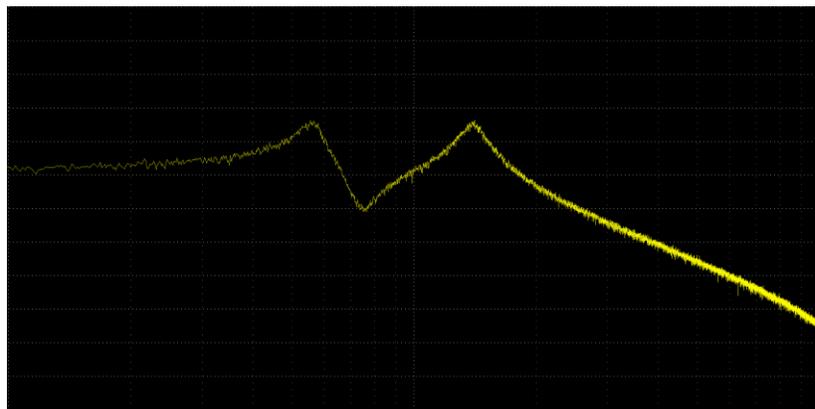
4 Pole Low Pass
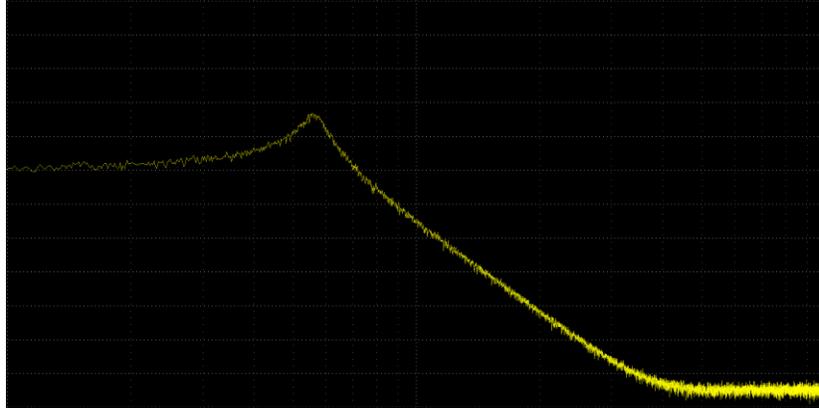
Low Pass, Peak

A Band-Pass is summed with a Low-Pass. The frequency of the Band-Pass is above the cut-off frequency of the Low-Pass. The Band-Pass and the Low-Pass filters move together.
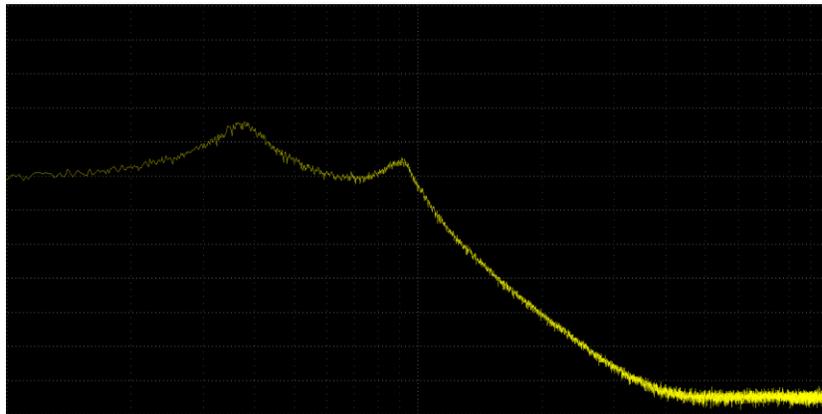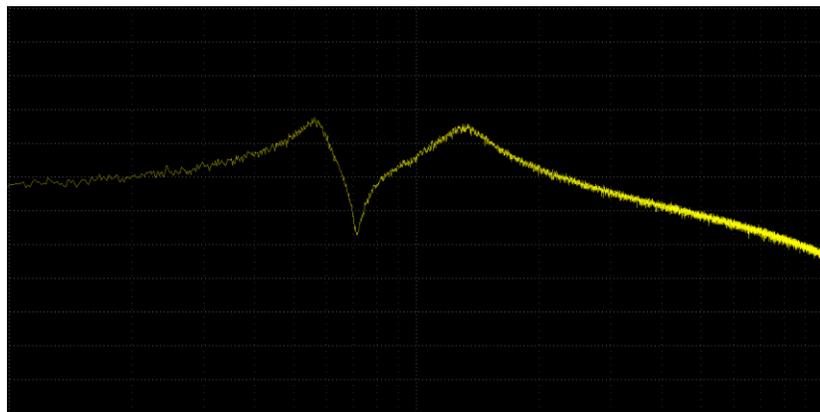

4 Pole Low Pass, Peak

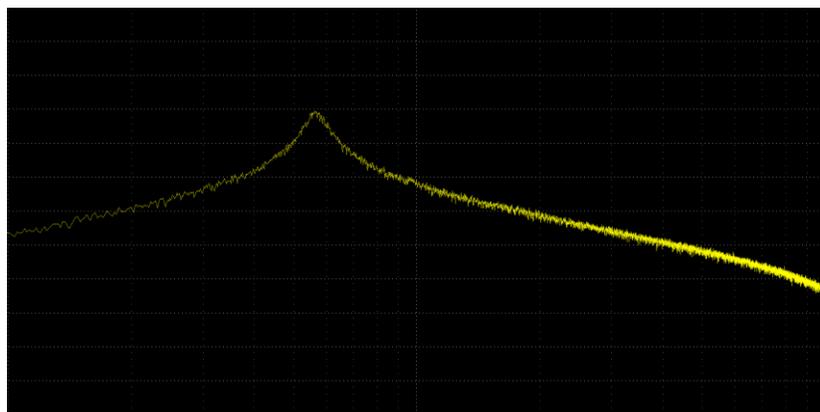Band-Pass summed with the 4 Pole Low-Pass. Independent motion.
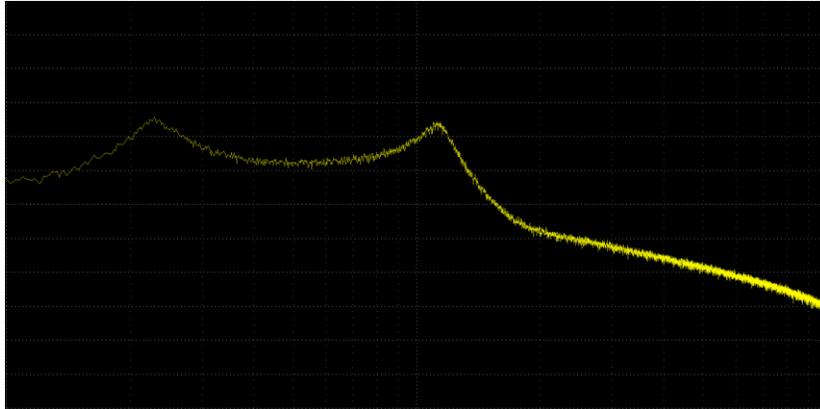
Peak, 4 Pole Low Pass

Another Band-Pass summed with 4 Pole Low-Pass, but here the Band-Pass frequency is below the cut-off frequency of the Low-Pass. Independent motion.

Band Pass

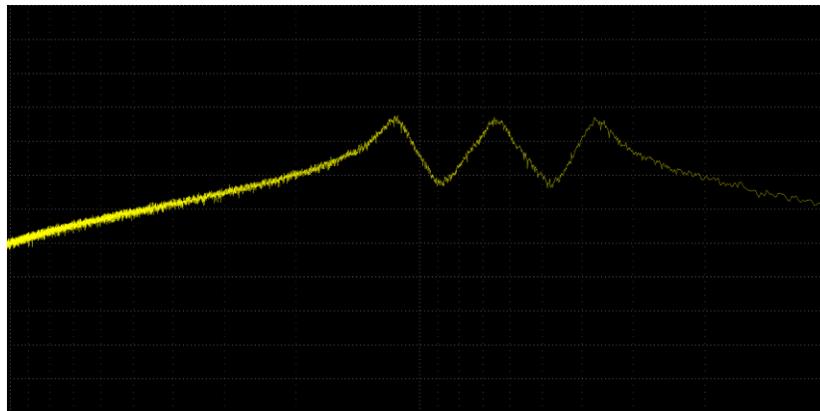Only a range of frequencies gets through. Higher Q's produce a narrower response.

Peak

The original input signal is summed with a Band-Pass. It looks something like a midrange control doing boost.
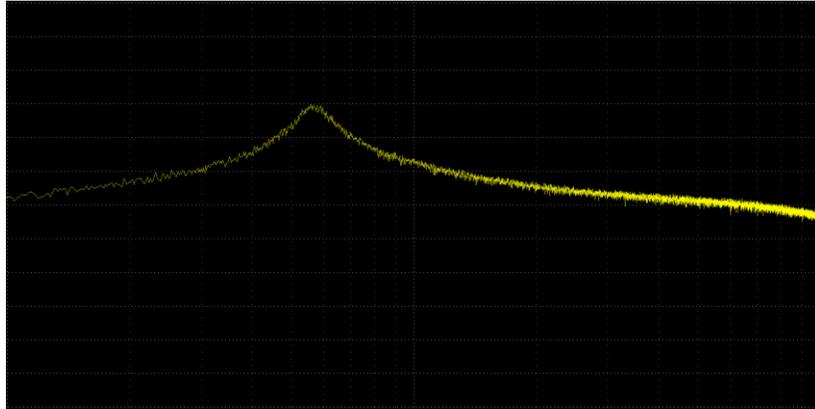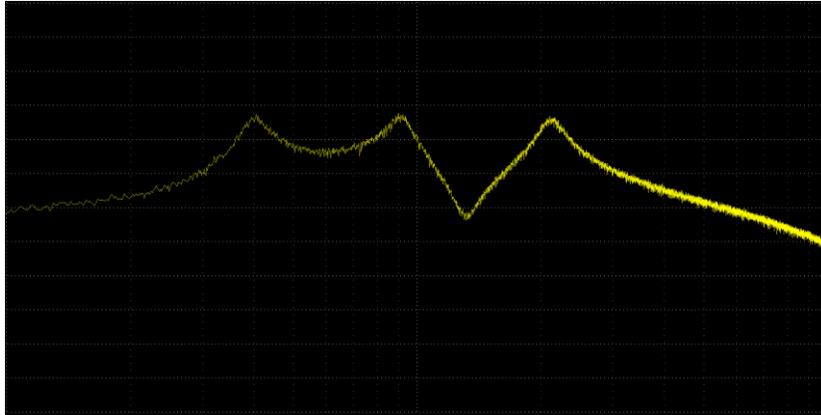

Triple Peak 1

Three Band-Passes summed. Independent motion. These triple Band-Passes can do some vocal sounding responses.
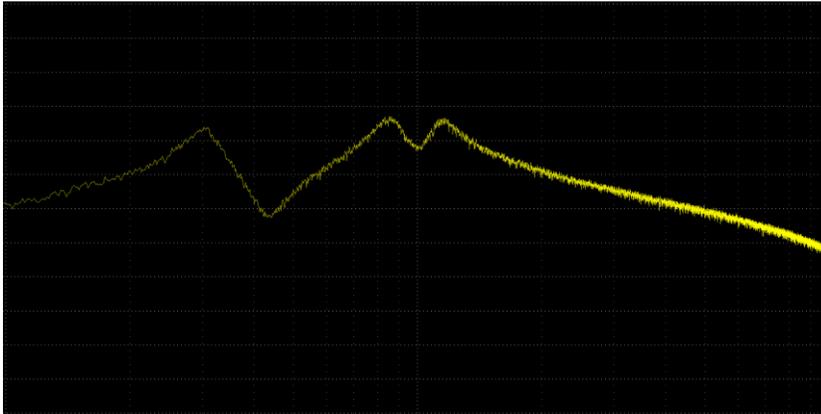

Triple Peak 2

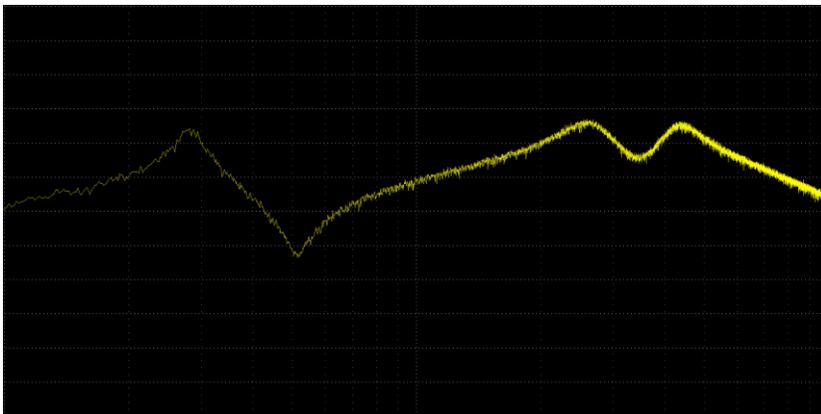Three Band-Passes summed. Independent motion.

Triple Peak 3
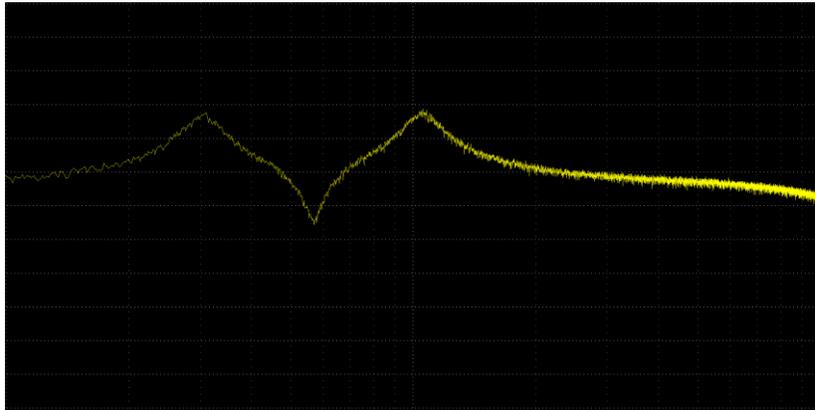
Three Band-Passes summed. Independent motion.

Triple Peak 4
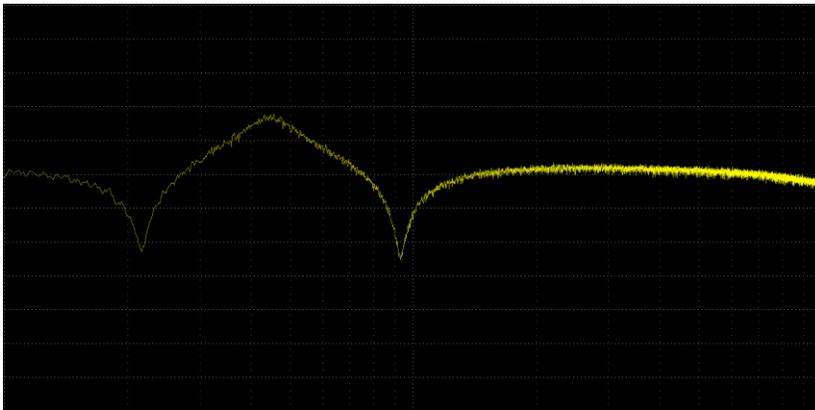
Three Band-Passes summed. Independent motion.

Peak, Notch, Peak

A flat frequency response has a peak, then a notch, and then another peak.
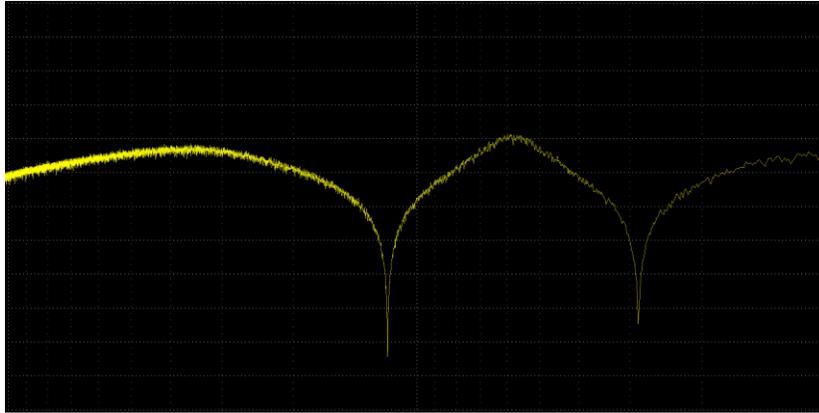

Notch, Peak, Notch

A flat frequency response has a notch, then a peak, and then another notch.

2-Stage Phaser

3-Stage Phaser
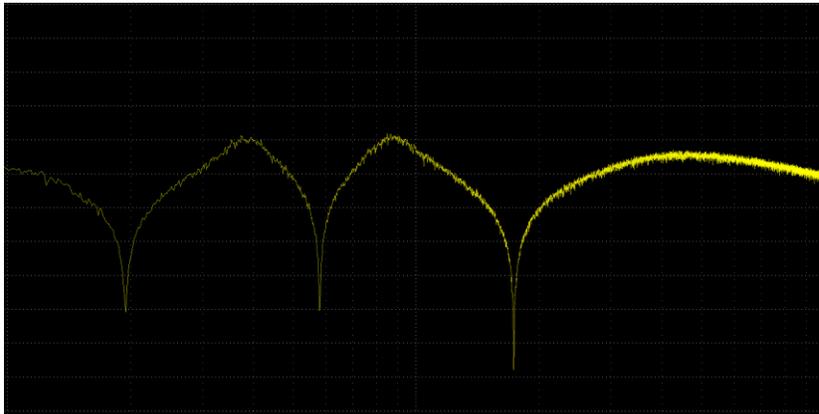
1-Stage Phaser
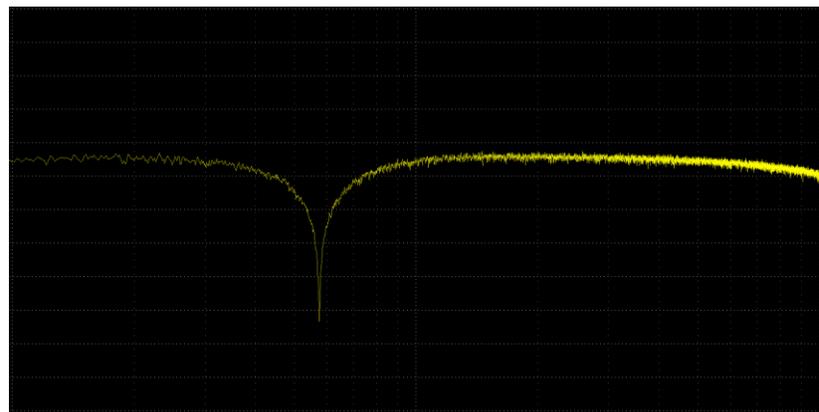
High-Pass

Frequencies below the cut-off frequency are rolled-off, at a rate of 6 dB/octave. There is a resonant peak at the cut-off frequency.
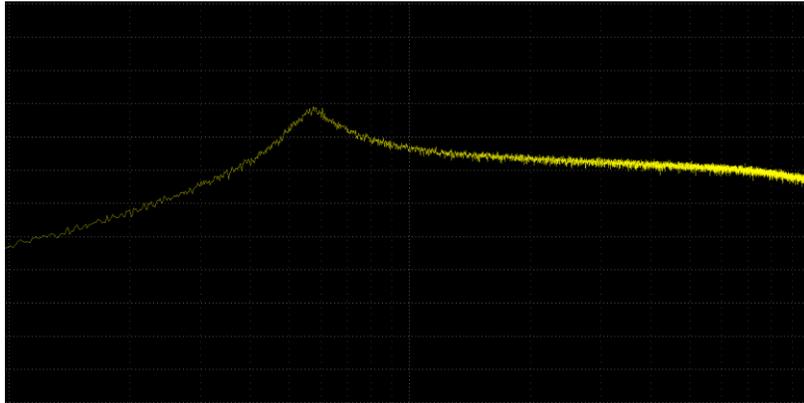
High Pass, Peak

A Band-Pass is summed with a High-Pass, above the cut-off frequency.
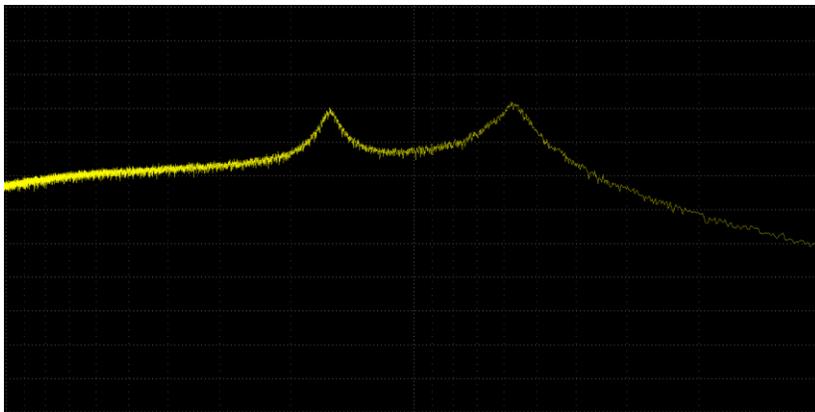
Crybaby

An accurate model of the classic cry-baby wah pedal. The Q control has no effect.
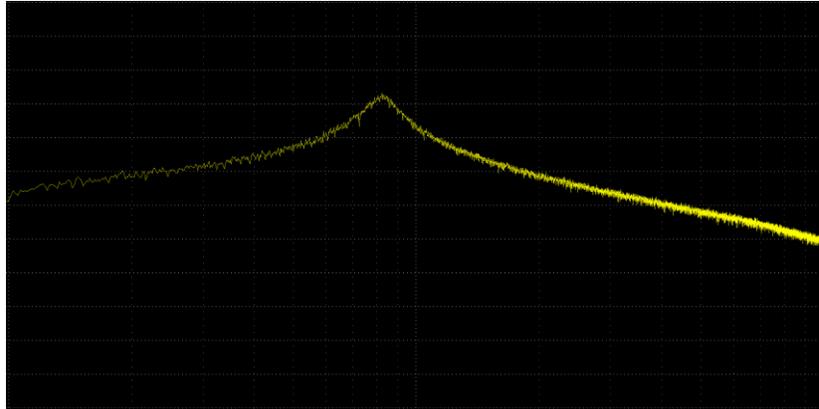
Band pass 2

Only a range of frequencies gets through. Higher Q's produce a narrower response.
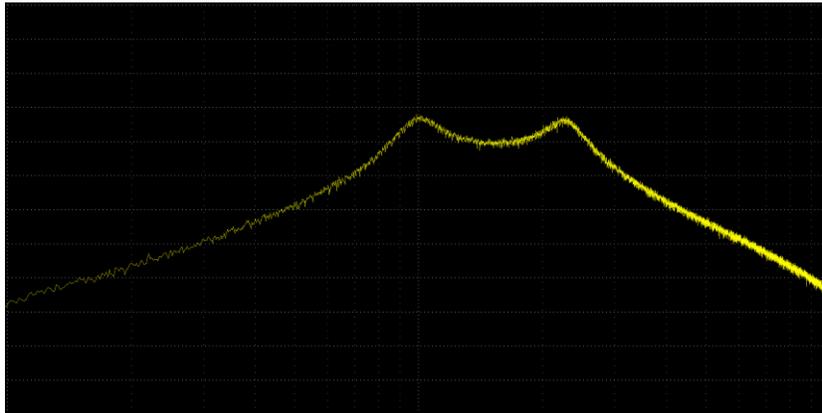
Double Peak

Input is summed with two Band-Passes. Independent motion.
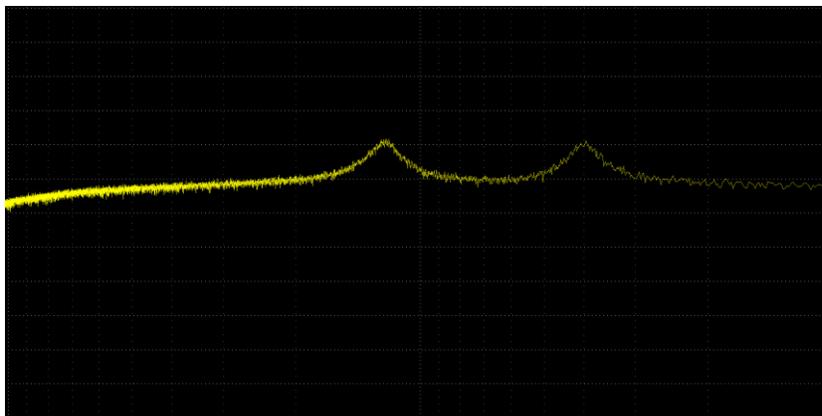
6 Pole All Pass

An All-Pass filter is one with a flat amplitude response, but where the phase is shifted, with higher frequencies getting more phase shift than lower frequencies. When modulated with a sine LFO of around 6 Hz, a strange vibrato may be obtained. This is the only way to add vibrato to the input signal.
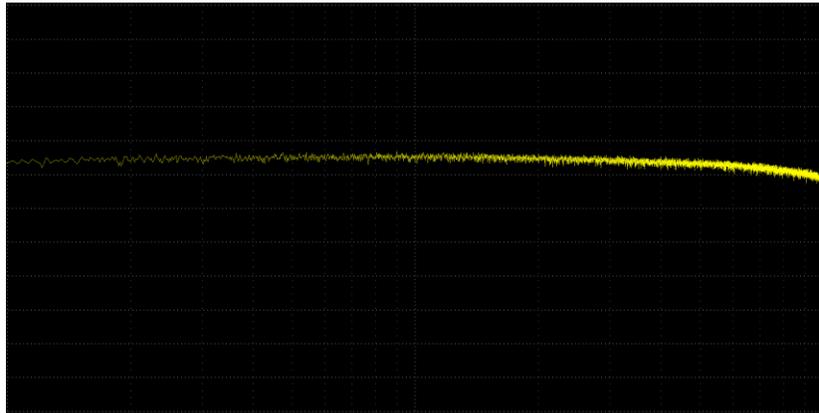
Mix 1 & 2

- Mix 1 and Mix 2 Blocks: The four meters labeled Voice 1 through 4 monitor the signal ratio routed through Processors 1 & 2. Please note that setting the Destination of *Mix 1* to *Output 1 Only* and *Mix 2* to *Output 2 Only* is necessary in creating stereo effects. Each Voice's position in the stereo spread is set with the Processor Pan control in each of the Voice blocks.
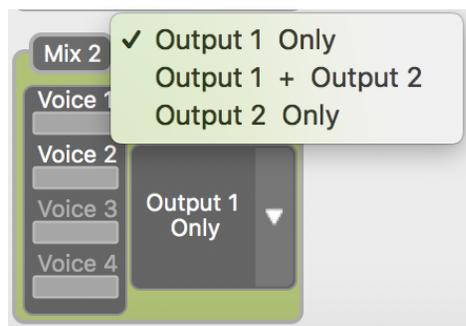
- Destination Dropdown Menus: Choose the final Output Destination of Processors 1 and 2. It is possible route the signal as follows
    - Output 1 Only: Routes all of that Processor's signals to the Spectrum's Output 1 jack.
    - Output 1 + Output 2: Routes all of that Processor's signals to both the Output 1 & 2 jacks.
    - Output 2 Only: Routes all of that Processor's signals to the Spectrum's Output 2 jack.

Envelope 1 & 2

The Envelopes control amplitude and filter modulation of the each Spectrum Voice. Both Envelopes 1 and 2 run independently of each other and each can be assigned a different set of Voices.

- Audio Input Selector Dropdown Menu: Selects the audio Input (select from Audio Input 1 and Audio Input 2) to which the Envelope will respond. This ability to isolate which input signal each envelope responds to allows for what is know as "side chaining" the envelope, meaning the envelope can react to a signal that is not necessarily being fed into one of the Voices or being heard in the Spectrum's final Output Mix.
- Envelope Type Dropdown Menu: Chooses the response of the Envelope. The Spectrum offers several different envelope types each with a different set of Attack, Decay, Sustain, and Release characteristics.
- Speed Knob: Depending on which Envelope Type has been selected; the Speed control adjusts how quickly the envelope opens and/or closes.
- Sensitivity Knob: Adjusts how sensitive the envelope is to the level of the incoming signal. Turning the down the Sensitivity allows for harder playing, requiring that the player pluck harder in order to fully open the envelope. Turning up the Sensitivity increases the likelihood that the envelope opens fully with lighter playing.
- Gate Knob: Adjusts the sensitivity of an internal Gate on the *Envelope to Speed* and *Envelope to Depth* controls (located in *the LFO 1 & 2* block), meaning the Gate zeros the Speed and Depth of the filter's LFO when it stops receiving an input signal above the assigned amplitude. Increasing the Gate knob causes the LFO to decrease below higher and higher input levels.

LFO 1 & 2

The LFOs (Low Frequency Oscillators) can be set to control the Filter modulation.

- **LFO Wave Shape Selector Dropdown Menu**: Choose from 14 different LFO wave shapes. Changing the wave shape changes the nature of the filter modulation. Choose from a range of sounds, from a smooth Sine wave modulation to a choppier Square wave modulation.
- **Restart on Env 1 Trigger Button**: Selecting this button allows you restart an LFO pattern every time a new note is struck. This can be especially noticeable with slow moving LFO rates or oddly shaped LFOs like the 4 Step or Rising Saw.
- **LFO Time Ratio Dropdown Menu**: The Spectrum limits the user to one LFO wave shape at a time, but it is possible to run two LFOs at different Beat Divisions. For example, by selecting "LFO 2 = 2x LFO 1," LFO 1 would run at a quarter note beat division while LFO 2 runs a 16th note beat division.
- **Speed Knob**: Adjusts the rate of the LFO. Please note that if LFO 1 and LFO 2 are set to different beat divisions, both rates will increase or decrease to scale during Speed knob adjustments.
- **Envelope To Speed**: Relies on the envelope filter to increase and decrease the speed of the LFO. Turning this knob to the right causes the LFO to modulate faster as the envelope opens then slow as the note fades and the envelope closes. Turning this knob to the right increases the maximum LFO modulation rate.
- **Envelope to Depth Knob**: Relies on the envelope filter to increase and decrease the depth of the LFO. Turning this knob to the right causes the LFO to modulate deeper as the envelope opens then decrease as the note fades and the envelope closes. Turning this knob to the right increases the maximum LFO modulation depth.
- **LFO 2 Phase Knob**: Increases the phase offset of LFO 2 form LFO 1. Turning the knob all the way up creates a complete phase reversal between the two LFOs.
- **Tap Tempo Button**: Tap this button in time with a drummer or rhythm track to override the Speed knob's setting and manually set the LFO rate. Please note that if LFO 1 and LFO 2 are set to different beat divisions, both rates will increase or decrease to scale during Tap Tempo adjustments.
- **Beat Division Dropdown Menu**: Sets the beat division of LFO 1. Note that the beat division of LFO 2 is a sub-set of LFO 1 and it is set in the LFO Time Ratio Dropdown Menu.
- **Hz Button**: Provides a readout in Hertz within the LFO Speed Monitor Window. Note that 1.00 Hz = 60 Beats Per Minute (BPM).

- **BPM Button**: Provides a BPM (Beats Per Minute) readout in the LFO Speed Monitor Window.
- **LFO Speed Monitor Window**: Monitors the LFO rate. Use this window to type in specific Hertz or BPM rates or use the up and down arrows to make subtle LFO rate adjustments.
- **MIDI Clock**: The Spectrum's LFO also responds to external MIDI clock, which the pedal can receive either through its USB port or a connected Neuro Hub.

Pitch Detector
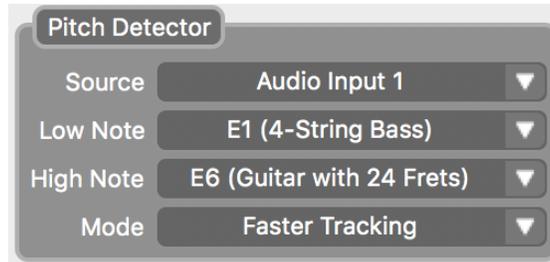
The Spectrum's Pitch Detector is an algorithm that detects the pitch of the connected instrument and uses it as a guide for creating octave effects. In nearly every case the user doesn't need to worry about the response of the Pitch Detector – that said, we do offer some adjustable parameters that refine the Pitch Detector and further decrease latency and improve pitch accuracy. Narrowing the range of notes you expect to play though the Spectrum will help in providing the best possible response.

- **Source Dropdown Menu:** Selects which Input signal the Pitch Detector algorithm responds.
- **Low Note Dropdown Menu**: Select the lowest possible note you plan to play. You may select a note as low as a low B on a 5-string bass.
- **High Note Dropdown Menu:** Select the highest possible note you plan to play. You may select a note as high as the 24th fret E on a 6-string guitar.
- **Mode:** The Spectrum's Pitch Detector has a choice of two different modes. *Faster Tracking* is the default mode and it is the best option when fast playing. *High Accuracy Tracking* is the second mode and it is best for slower playing where pitch accuracy is crucial.

Knob Assign
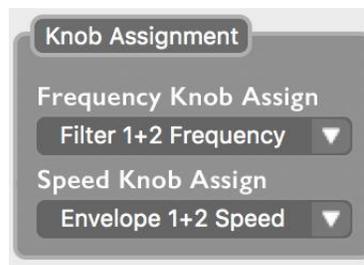
Use the Frequency & Speed Knob Assign dropdown menus to reassign the Primary parameter of the FREQ/RES and SPEED/VOL knobs.

External Control
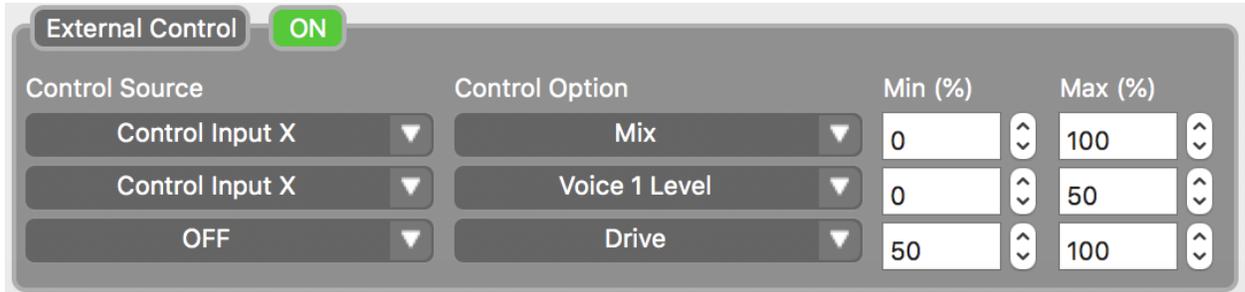
The External Control block is where external expression control is assigned to devices like the Source Audio Dual Expression Pedal, Hot Hand 3 Wireless Controller, and expression devices connected to a Neuro Hub. All external control expression devices connect to the CONTROL INPUT jack on the topside of the pedal with a 1/8" TRRS cable.

- **ON Button:** Engages/disengages external control.
- **Control Source:** It is possible to control up to three parameters with external expression – each of the three rows in the External Control block are assignable to a single parameter. Use the Control Source dropdown menus to select the type of external controller being used. There are three different options in this menu:
  - **Control Input X:** Select this option when using an expression pedal or the X-axis of the Hot Hand 3 Wireless Controller.
  - **Control Input Y:** Select this option when using the Y-axis of the Hot Hand 3 Wireless Controller.
  - **Expression (Hub/MIDI):** Select this option when using an expression controller connected to the EXP IN or SENSOR IN jacks on the Neuro Hub.
  - **OFF:** Use this option to disengage expression control for the entire row.
- **Control Option:** Select from a long list of parameters available for expression control.
- **Min (%) and Max (%):** Sets the high and low points of each parameter receiving expression messages. Setting *Min (%)* to 0 and *Max (%)* to 100 will assign the full breadth of the parameter to the expression controller.

Routing & Options
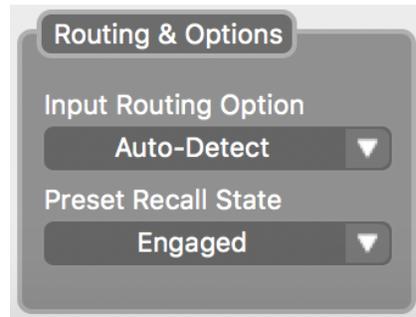
The Spectrum's stereo inputs and outputs offer dramatic stereo effects and numerous complex signal routing options, including "side chain" and the insertion of external pedals to the signal path. Side chain is particularly useful with envelope filters, because a dry signal is sent to the envelope detector, while the wet signal is sent to the filter section. A useful template for side chain routing can be found as a factory preset in the Neuro preset library. Many other stereo routing options can be accomplished with each Voice's Processor Pan parameter combined with the final Destination dropdown in the MIX 1 & 2 blocks. (See the Processor Pan section for details on stereo routing)

- **Input Routing Option:** Selects the configuration of the Input jacks per preset. There are four different options:

  - **Auto Detect (Default):** This is the default setting – it detects which input jacks are currently being used and configures the routing accordingly.
  - **Single Input 1:** Use this setting if you have a single instrument cable plugged into Input 1.
  - **Dual Input 1 & 2:** Use this setting if you have instrument cables plugged into both Inputs 1 & 2.
  - **External Loop (Pre-Processing):** It is possible to manually set up most all stereo Input and Output routing using a combination of the Processor Pan parameter in each of the Voice blocks and the Destination dropdown menu in the Mix blocks – this includes effects loops either between Voices or at the end of the signal path. The one routing option that can't be set up manually is the an external effects loop that places the external effect in front of the Spectrums's Voice processor. Choose this option if you wish to create a pre-Voice external effects loop. See the diagram below to get a better understanding of the routing.

External Loop Pre-Effect
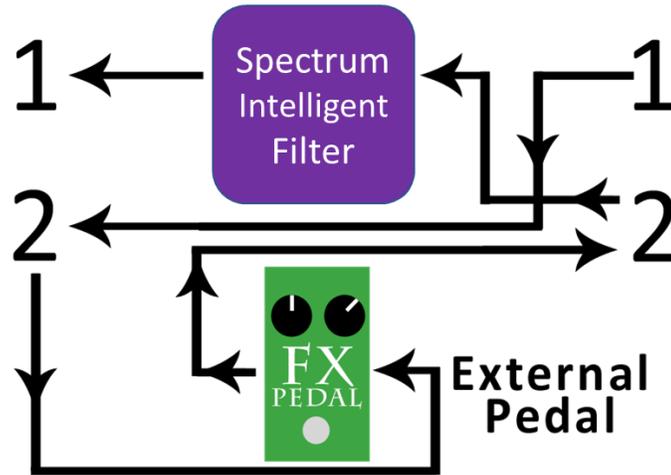
- **Preset Recall State:** Selects the Engaged/Disengaged state of the preset when recalled via a MIDI Program Change (PC) message.

Presets

The Presets section, located on the right side of the Spectrum's Neuro Desktop interface, displays the location of all presets stored directly to the pedal. The Presets section is also where users can browse the Published Presets of other Spectrum Filter users. There are two views available in the Presets section - click on the icon labeled Device or Cloud (located in the blue square on the top right corner) to open each view respectively.

Device

Clicking the *Device* icon on the top-right corner of the *Presets* section opens the Device interface. This view displays the presets saved to all 128 possible locations on your Spectrum pedal. This view also contains buttons that save, export, import, and publish presets:
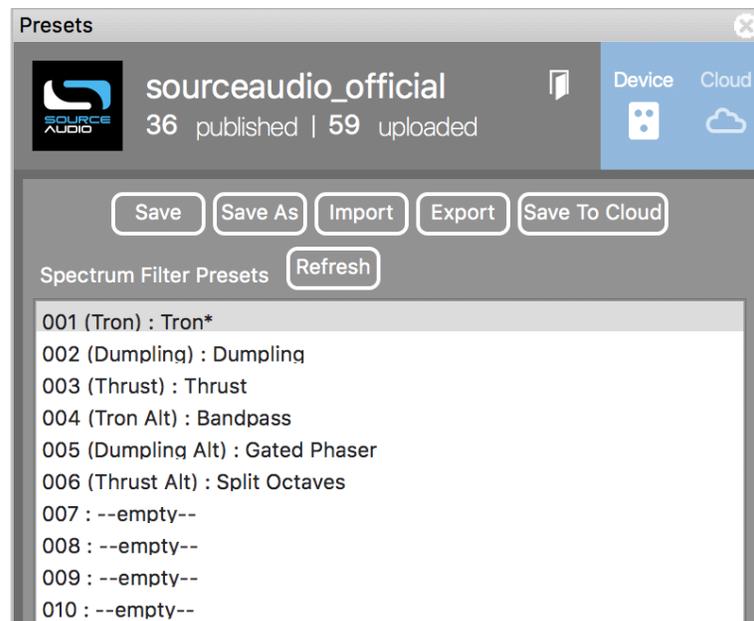
- **SAVE Button:** If you have made edits to a pre-existing preset, use the Save button to update the preset without changing its name or preset position.
- **SAVE AS Button:** After creating a new preset hit the Save As button and you will be prompted to name it and select its preset number.
- **IMPORT Button:** Uploads saved .pre files to your Neuro Desktop Editor. Upon clicking the IMPORT button you will be asked to find the .pre file. Simply go to your Neuro presets folder, select the desired file and upload.
- **EXPORT Button:** Use the Export button to save a preset on your computer. Presets are saved as .pre files and stored anywhere on your computer (we recommend creating a dedicated folder to store your presets). After creating a preset, hit the Export button - a window will pop up, asking you to name, tag, and select a location for the preset.
- **SAVE TO CLOUD Button:** It is also possible to save your preset to a private Cloud based storage location or Publish it for the rest of the Spectrum Intelligent Filter community to try. After

creating a preset, hit the SAVE TO CLOUD button. A box will pop up asking you to name it and provide a description. It will also ask you for YouTube or SoundCloud link (this is optional). The YouTube and SoundCloud links are there for you to embed sound clips of your preset so that others can quickly hear what you've created. From there you can either *Save* it to your private Cloud based storage (available in the My Library tab in the Cloud view) or *Save and Publish* it for the rest of the Spectrum community.

- **REFRESH Button:** Hit the Refresh button to restore the Neuro Desktop edits to the state immediately after your last SAVE procedure.
- **SPECTRUM INTELLIGENT FILTER PRESETS:** This field, below the Device buttons, displays all of the presets saved directly to your Spectrum pedal. They are labeled 1 through 128. The first six preset positions are directly accessible via the Spectrum's three toggle switch positions and two preset banks, the rest are accessible via an external MIDI host controller with USB connection capabilities.

Cloud

Clicking the *Cloud* icon on the top-right corner of the *Presets* section opens the Cloud interface. This view displays the *Community, Factory, My Library,* and *My Published* presets tabs. Click each respective tab to open its unique collection of Cloud based user presets. The Cloud view also includes a Search/Filter section just below the tab options.
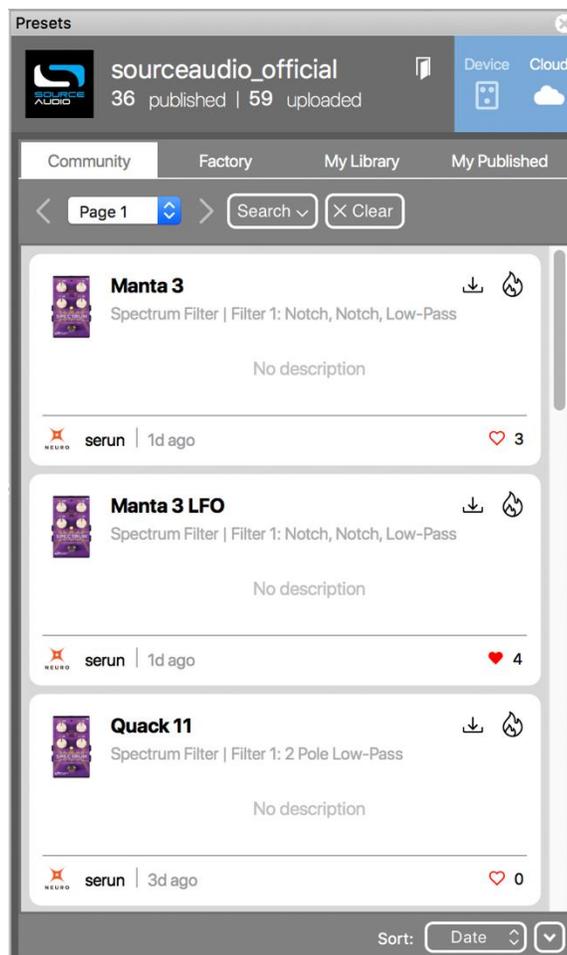
Browse, Burn, and Play

The Cloud offers access to the vast landscape of Spectrum preset created by the Source Audio staff and the ever-growing community of Spectrum users. It's as easy as "Browse, Burn, and Play."

The graphic above displays the Cloud view of Spectrum Filter User Presets. To test a Preset, simply click anywhere on the Preset listing, instantly the Preset will upload to your Spectrum pedal. If you like what you hear go to the top-right corner of that Preset listing and click either the BURN or DOWNLOAD icons. If you want to save the sound directly to one of the toggle switch positions on your Spectrum pedal (or one of the Spectrum's 128 MIDI accessible presets), simply click the BURN icon (the flame) to upload the preset directly to your pedal. After clicking the BURN icon a box will pop up asking where you would like to store the preset – select a position and hit SAVE. The Preset is now loaded to your Spectrum and ready for the next gig.

To save a Preset to your personal Library of Presets, click the Download icon and hit SAVE. The Preset will store instantly to the MY LIBRARY tab.

- **COMMUNITY Tab:** Click the Community tab to view all of the presets created by the entire Neuro community. To test a preset, simply click anywhere on the preset listing and it will instantly upload to your Spectrum pedal.
- **FACTORY Tab:** Contains presets created by the Source Audio team and other synth aficionados.
- **MY LIBRARY Tab:** Contains all the presets you have saved to your personal preset library.
- **MY PUBLISHED Tab:** Contains all the presets that you have published and made available to the entire Spectrum Intelligent Filter community.

Daisy-Chaining Neuro Communication

If you have multiple Source Audio One Series pedals running in series, it is possible to maintain Neuro communication with each pedal through a single Neuro cable connection. Source Audio makes couplers that are designed specifically for connecting multiple One Series products in series. These couplers are available at the Source Audio Reverb.com Store.

A standard set of TS and TRS cables work as well (we recommend the flat TS and TRS cables manufactured by Rockboard). The examples below explain how to make your Neuro Daisy-Chain connections in a mono or stereo rig.

Mono Audio Path with Neuro Daisy-Chain

In the case of a purely mono audio signal path, the Neuro data can be input to the first effect directly from the mobile device and then carried on to the second effect via TRS cable.

Mono-To-Stereo Audio Path with Neuro Daisy-Chain

In the case of a signal path that splits a mono input to stereo outputs, the Neuro data can be input to the first effect directly from the mobile device and then carried on to consecutive effects via TRS cables. The audio signal is carried on the same cable.

MIDI Through the USB Port or Neuro Hub

The Spectrum responds to MIDI Program Change (PC) and Continuous Controller (CC) messages via its mini USB port.

The Spectrum's USB port is plug-and-play ready for Digital Audio Workstation (DAW) software on Windows and Mac computers. The Spectrum uses class-compliant drivers, so no special drivers are needed. Just power up the pedal and connect it to the computer using a USB cable. The computer should automatically recognize the Spectrum, which will be identified as "Source Audio One Series" in the operating system.

A MIDI host device with USB will also control the Spectrum. The Spectrum responds to most devices, but some don't generate enough power for the Spectrum to recognize them as a MIDI host (the MIDI Baby and qCONNECT are two examples). If your Spectrum is not responding to your MIDI host device, try checking the *USB-MIDI Skip Power Check* box in the Neuro Editor's *Hardware Options* menu.

MIDI Channel

By default, the Spectrum responds to MIDI Channel 1. The Spectrum ignores all MIDI messages sent to it that are not on its channel. The input MIDI channel for the Spectrum can be changed in the

Hardware Options menu of the Neuro Editors. Note that the MIDI Input Channel is a **global** setting that is NOT saved per preset. Note that some manufacturers begin counting MIDI channels at zero (from 0 to 15), while the Source Audio Neuro Editors use the convention of counting from 1 to 16.

The Spectrum Intelligent Filter and the Neuro Hub

Currently the Spectrum Filter cannot receive MIDI Program Changes (PC) and change presets via the Neuro Hub – PC messages can only come through the Spectrum's USB port. However, the Spectrum can receive MIDI CC messages through a Neuro Hub connection.

Custom MIDI CC Mapping

The Spectrum Intelligent Filter has very few default MIDI mapping - MIDI CC messages must be mapped with the Neuro Desktop Editor. Custom MIDI CC mappings are global; they will apply in all situations, regardless of which preset is active.

To create a custom MIDI CC mapping, follow these steps:

1. Connect your Spectrum to the Neuro Desktop Editor.
2. In the top bar menu select *Device > Edit Device MIDI Map* from the dropdown menu.
3. The *Spectrum MIDI Map Editor* window will open. Scroll to the MIDI CC value you wish to map and select that CC's dropdown menu. A list of parameters will unfold.
4. Select the parameter you wish to assign to the chosen CC. The process is complete.

The Spectrum comes with certain functions and parameters pre-mapped. The following table lists the current MIDI mapping:

Parameter	CC#	Value	Description
Remote Tap Tempo	93	0-127	Externally control the LFO rate
Remote Expression Pedal	100	0-127	Assign parameters with Neuro Editor
Engage/Bypass	102	0-127	0-64 Bypass, 65-127 - Engage
Preset Recall (Off)	103	0-127	Recalls any preset in bypass
Preset Recall (On)	104	0-127	Recalls any preset engaged
Engage/Bypass Toggle	105	any	

For parameters like Mix and Level, which are normally controlled by knobs, the full range of continuous control values from 0 to 127 will be mapped to the range of the knob.

For the engage/bypass footswitch, continuous control values in the range of 0-63 will bypass the Spectrum and values in the range of 64-127 will enable the pedal.

Any MIDI CC, from 0 to 127, can be mapped to a control on the Spectrum.

Each CC number can only be mapped to control one parameter at any given time. If you attempt to map a CC that has already been assigned to another parameter, the previous mapping will be overridden.

Several CCs can potentially be mapped to the same parameter, although this is not very useful.

MIDI Clock

The Spectrum Intelligent Filter's LFO will sync to MIDI clock messages (also known as MIDI timing clock or MIDI beat clock). MIDI clock is tempo-dependent and is used to ensure that multiple MIDI-enabled devices stay in synchronization. A common use of MIDI clock with the Spectrum is when recording along to a click track in a DAW (Digital Audio Workstation) running on a computer. MIDI clock can be sent to the Spectrum directly over USB-MIDI or the Neuro Hub.

MIDI Clock can be enabled within the Spectrum on a per-preset basis. To enable MIDI Clock go the *LFO 1 & 2* block in the Neuro Desktop Sound Editor interface and select the *MIDI Clock* button. The Spectrum begins its MIDI Clock sync as soon as the first MIDI Clock message is received. If the tempo changes, the rate of MIDI Clock messages will change as well, and the Spectrum will adjust to resynchronize itself accordingly.

Use the *Beat Division* dropdown menu in the *LFO 1 & 2* block in the Neuro Desktop Sound Editor to select the rhythmic subdivision of the incoming MIDI Clock. The Beat Division options are *Whole, Half, Quarter, Eighth, Triplet, and Sixteenth* notes.

The Spectrum does not sync to MIDI timecode containing SMPTE timestamps.

Updating Spectrum Intelligent Filter Firmware

Firmware updates are achieved using the Neuro Desktop Editor. Download the latest version of Neuro Desktop Editor from the Source Audio Downloads page. Open the updated Neuro Desktop and connect the Spectrum to a computer using a mini USB cable. If the Spectrum is in need of an update the Firmware Updates icon (the arrow icon) in the Connections field will be framed in yellow. Simply click on the Firmware Updates icon you will be prompted through the process.

Spectrum Intelligent Filter Specifications

Dimensions

- Length: 11.63 cm (4.58 inches)
- Width: 7.00 cm (2.75 inches)
- Height (not including knobs and footswitch): 3.71 cm (1.46 inches)
- Height (including knobs and footswitch): 5.61 cm (2.21 inches)

Weight

- 280 grams (0.625 pounds)

Power

- 9V DC, minimum 165 mA (maximum 195 mA when connected to a power reliant external controller)
- Negative tip (positive sleeve) barrel power jack, 2.1 mm inner diameter, 5.5 mm outer diameter

Audio Performance

- Maximum Input Level: +6 dBV = 8.2 dBu = 2 V RMS = 5.6 V p-p
- Input Impedance: 1 MegaOhm (1 MΩ)
- Output Impedance: 600 Ohm (600 Ω)
- 108 dB DNR Audio Path
- 24-bit Audio Conversion
- 56-bit Digital Data Path
- Universal Bypass^{TM} (relay-based true bypass and analog buffered bypass)

Troubleshooting

General

Restore factory settings: In order to revert the Spectrum to its factory settings, clearing all user data, presets, expression mappings and custom effect types, perform a factory reset using one of the methods described below.

Factory Reset using the Hardware

Disconnect power. While holding down the footswitch, reconnect power. The main LED and control LED will be lit for a few seconds. When the reset is complete both LEDs will turn off and you can release the footswitch.

Factory Reset using the Neuro Mobile App

Using the Neuro Mobile App, go to Hardware Settings and choose the Factory Reset option.

Factory Reset using the Neuro Desktop Editor

Connect the Spectrum Intelligent Filter to the Neuro Desktop Editor. From the top bar menu select Device > Factory Reset > when the Confirm Factory Reset window pops up, select "Yes."

Noise

Power source: Ensure that the factory power supply is being used, or an isolated power supply or pedal power port providing 9V and a minimum of 165mA.

Near noise source: Move pedal away from power supplies and other equipment.

Other equipment: Remove other effects from signal chain; see if noise persists.

Bad cables: Swap out audio cables.

USB ground loop: When connected to a computer using a USB cable, noise can appear in the audio signal. This usually results from ground loop noise due to the Spectrum and computer running on separate power supplies. In the case of laptops, disconnecting the computer's power supply and running it on a battery can often mitigate the noise. External display monitors are often the primary source of noise, and powering down monitors can also resolve noise issues.

Unit Appears Dead / No LEDs Lit

Effect is bypassed: Press the footswitch to enable the effect and see if the main LED turns on.

Wrong power supply: Use correct power supply. See the DC 9V (Power) section for more details.

Corroded power cable plug: Check power plug for corrosion on sleeve. Swap out power supply if necessary.

Frequently Asked Questions

What kind of instruments can I connect to the Spectrum's inputs?

The Spectrum's audio inputs are high impedance (~ 1 MΩ). It can accept high impedance signal sources like guitars/basses with passive pickups, as well as low impedance sources like line-level audio circuits, guitars/basses with active pickups, electronic keyboards, or mixer outputs. The input circuit can handle signals ranging up to 5.6 Volts, peak-to-peak.

Can I power the Spectrum directly over USB, without using the 9 Volt supply?

No. USB provides 5 Volts, but the Spectrum needs 9 Volts, so the pedal cannot be powered directly from USB. Make sure that you have plugged in the included 9V DC power supply when connecting to the Spectrum's USB port.

When connecting the Spectrum to a recording interface or mixer, should I used a Lo-Z (microphone) or Hi-Z (line / instrument) input?

The Spectrum's output will be low impedance when the effect is active or in buffered bypass mode, but it will be high impedance when using true bypass mode and a guitar with passive pickups. Therefore, it is recommended that you use a high impedance (Hi-Z) input on your recording interface or mixer to avoid signal loss.

Can I use the Spectrum in my amp's effects loop?

The audio inputs can handle up to 8.2 dBu or 5.6 Volts peak-to-peak, which allows them to work in most amp effects loops. In order to avoid clipping, be sure to check your amp's documentation and verify that the maximum send level is less than 5.6 Volts peak-to-peak.

How do I update the firmware?

Firmware updates are achieved using the Neuro Desktop Editor. Download the latest version of Neuro Desktop Editor from the Source Audio Downloads page. Open the updated Neuro Desktop and connect the Spectrum to a computer using a mini USB cable. If the Spectrum is in need of an update the Firmware Updates icon (the arrow icon) in the Connections field will be framed in yellow. Simply click on the Firmware Updates icon you will be prompted through the process.

Mac Gatekeeper

Mac users may see this warning message when trying to open the updater software: "App can't be opened because it was not downloaded from the Mac App Store." In order to run the updater, please refer to the steps in this Apple support article: https://support.apple.com/en-us/HT202491.

Rubber Feet

The Spectrum Intelligent Filter comes standard with a flat aluminum bottom, making it easy to apply Velcro and mount to a pedalboard. Additionally, adhesive rubber feet are included in the Spectrum's box. Applying the rubber feet to the bottom of the pedal can help prevent it from sliding on flat surfaces such as a hardwood floor.

Waste Disposal Notes

If possible, dispose of the device at an electronics-recycling center. Do not dispose of the device with the household waste.

For full compliance with EN 61000-4-6 standard, input cable must be less than 3 meters in length.

Warranty

Limited Transferrable Warranty

Source Audio, LLC (hereinafter "Source Audio") warrants that your new Source Audio One Series Spectrum Intelligent Filter, when purchased at an authorized Source Audio dealer in the United States of America ("USA"), shall be free from defects in materials and workmanship under normal use for a period of two (2) years from the date of purchase by the original purchaser. Please contact your dealer for information on warranty and service outside of the USA.

Under this Limited Warranty, Source Audio's sole obligation and the purchaser's sole remedy shall be repair, replacement, or upgrade, at Source Audio's sole discretion, of any product that, if properly used and maintained, proves to be defective upon inspection by Source Audio. Source Audio reserves the right to update any unit returned for repair and to change or improve the design of the product at any time without notice. Source Audio reserves the right to use reconditioned parts and assemblies as warranty replacements for authorized repairs. Any product repaired, replaced, or upgraded pursuant to this Limited Warranty will be warranted for the remainder of the original warranty period.

This Limited Warranty is extended to the original retail purchaser. This Limited Warranty can be transferred to anyone who may subsequently purchase this product provided that such transfer is made within the applicable warranty period and Source Audio is provided with all of the following information: (i) all warranty registration information (as set forth on the registration card) for the new owner, (ii) proof of the transfer, within thirty (30) days of the transfer, and (iii) a photocopy of the original sales receipt. Warranty coverage shall be determined by Source Audio in its sole discretion. This is your sole warranty. Source Audio does not authorize and third party, including any dealer or sales representatives, to assume any liability on behalf of Source Audio or to make any warranty on behalf of Source Audio.

Warranty Information

Source Audio may, at its option, require proof of the original purchase date in the form of a dated copy of the original authorized dealer's invoice or sales receipt. Service and repairs of Source Audio products are to be performed only at the Source Audio factory or a Source Audio authorized service center. Prior to service or repair under this Limited Warranty, the purchaser must request from Source Audio a return authorization, which is available at:

Source Audio LLC
120 Cummings Park, Woburn, MA 01801
(781) 932-8080 or at www.sourceaudio.net

Unauthorized service, repair, or modification will void this Limited Warranty.

Disclaimer and Limitation of Warranty

Do not open the effects pedal under any circumstance. This will void the warranty.

The foregoing limited warranty is the only warranty given by Source Audio and is in lieu of all other warranties. All implied warranties, including warranties of merchantability and fitness for any particular purpose, exceeding the specific provisions of this limited warranty, are hereby disclaimed and excluded from this limited warranty. Upon expiration of the applicable express warranty period, Source Audio shall have no further warranty obligation of any kind, express or implied. Source Audio shall in no event be liable for any special, incidental, or consequential damages suffered by the purchaser or any third party, including without limitation, damages for loss of profits or business or damages resulting from use or performance of the product, whether in contract or in tort. Source Audio shall not be liable for any expenses, claims, or suits arising out of or relating to any of the foregoing. Some states do not allow the exclusion or limitation of implied warranties so some of the above limitations and exclusions may not apply to you. This Limited Warranty gives you specific legal rights, and you may also have other rights, which vary, from state to state. This Limited Warranty only applies to products sold and used in the USA. Source Audio shall not be liable for damages or loss resulting from the negligent or intentional acts of the shipper or its contracted affiliates. You should contact the shipper for proper claims procedures in the event of damage or loss resulting from shipment.

Version History

August 13, 2019: Initial Release