

# Poly Evolver Keyboard Operation Manual



*Dave Smith Instruments*



# **Poly Evolver Keyboard Operation Manual**

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[www.DaveSmithInstruments.com](http://www.DaveSmithInstruments.com)



Tested To Comply  
With FCC Standards  
FOR OFFICE USE



This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:  
(1) This device may not cause harmful interference and  
(2) this device must accept any interference received, including interference that may cause undesired operation.

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

**For Technical Support, E-mail to: [help@davesmithinstruments.com](mailto:help@davesmithinstruments.com)**

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# Welcome...

Thanks for purchasing the Poly Evolver Keyboard! Listen to the sounds, twiddle some knobs, have some fun!

## Register

If you purchased your Poly directly from us, there is no need to register – we already have your contact information. If you purchased it from a music dealer, please go to [www.davesmithinstruments.com](http://www.davesmithinstruments.com) and register.

## Quick Start

Here's how to quickly get started with your new keyboard:

First, plug in the power supply. The power supply will work anywhere in the world; use the included Euro AC adapter if necessary. Next, plug the stereo audio outputs into your mixer/sound system and switch on the power.

The Poly Evolver has two main modes, Program and Combo. Program mode sets all 4 voices to the same sound, one of the 128 Programs in 4 Banks (512 total). It powers up in Program mode, ready to play. If you are an Evolver owner, you are already familiar with the basic Poly voice – it is the same, but now there are four of them!

Programs are usually meant to be played from the keyboard, but you have the option of hitting the Sequencer's START/STOP switch, and voice 1 will play the sequence associated with that Program. You can then play along with the other 3 voices. Not all Programs have pre-programmed sequences.

Try applying keyboard pressure (aftertouch) and the mod wheel. Many sounds are fairly simple at first, then come alive when you use the controllers. With other sounds, you may need to hold the notes a while to let the sound unfold. Playing in different ways has a big effect on the Programs.

## Selecting and Editing Programs, Combos, and Global Settings

There are a number of ways to change Programs; you can use the ten key pad to directly select any Program, and use the 4 Bank switches to select banks. Or, you can use the +/- switches to step through the Programs. Finally, the PARAM 1 knob changes the Program number, and the PARAM 2 knob changes the Bank. Check the diagram on the next page for reference.

If you want to edit a Program, just turn any knob. The new value will be displayed in the LCD. Once a parameter has been selected, the PARAM 1 knob will also change the value, and the +/- switches will increment or decrement the value.

That's the whole idea with this instrument – grabbing knobs and changing the sound!

To select Combo mode, press the COMBO switch. Combos give you complete flexibility configuring the four voices; you can stack or split the keyboard, assign different Programs to different MIDI channels, set it to play multiple different sequences synchronously, and so on.

There are 3 banks of 128 Combos for a total of 384. There are up to 4 Parts in each Combo, though all four do not have to be used. For example, a split Combo, with one voice for bass on the low end of the keyboard, and 3 polyphonic voices on the upper end, would only require 2 parts. The COMBO PART switches select the four parts for quick editing.

Your Poly Evolver also has some very cool features for use as a stereo signal processor. In Combo mode you can have one or more voices using the External Signal Input, so the external signal can be routed to all four voices, with each voice doing different processing, such as filtering, envelope following, distortion, feedback, delay, driving a sequence, and so on.

Press the GLOBAL switch to change higher level parameters, such as MIDI channel number, Transpose/Detune, and so on. These are remembered when the synth is turned off. Note that in Global Mode, the screen displays two parameters at a time. The top parameter is changed by the PARAM 1 knob and the lower parameter is edited by the PARAM 2 knob. The +/- switches select new pages.

## Summary

You should be up and running now; for more operation information, read on. Or, just look up specific parameters for detailed notes. Pages 41 through 43 contain a handy reference for mod destinations and sources. At some point you should read through the manual to discover all the little features that you might not notice at first.

I should mention that this manual does not include explanations of basic synthesizer functions. It assumes you already know what an oscillator is, how a lowpass filter affects the sound, what an ADSR envelope looks like, and so on.

Fortunately, these days it is quite easy to find such resources on the Internet. If you want to learn the lingo and the basics, just try a search in Google (or the search engine of your choice), something like “analog synthesizer tutorial”. You’ll find plenty of good reading material.

Have fun!

Dave Smith

Special thanks to the “bragging rights” team for their assistance during development: Tim Ande, David Bryce, Robert Shanks, Ravi Ivan Sharma, and Stefan Trippler. Also to Mark Wilcox for assistance on this manual.

# About the Presets

There are 512 Programs and 384 Combos in your Poly Evolver. The factory sound set is on our website if you ever need to refresh it. There are additional banks of Programs at:

<http://www.davesmithinstruments.com/polyevolver/sounds.html>

Remember to save your sounds via program dumps occasionally!

The Programs are not set up in any particular order, so you might just want to listen through them to see what you like. Bank 4 programs are used for most of the combo sequences, so some may not make sense as a program. There are some test Programs at the end of Bank 4 that you might want to erase. Also, Program 128 in all four banks is a simple basic Program that you can use as a starting point.

Combos are also mixed, again with some test Combos at the end of bank 3. You will also see that there is only one bank of Combos. You will likely want to make your own Combos based on the specific combinations of Programs that fit your music.

When using Combos, remember that changing a Program will affect any Combo that refers to it.

The Programs and Combos were collected from previous Evolver and Poly Evolver Rack patches, and a bunch of new ones were made up for the keyboard. Special thanks to Program contributors (past and present), including:

Tim Ande  
Andrew Bode  
Cameron Brand  
David Bryce  
Chris Curtis  
Mike Estee  
Don Gothard  
Damon Menne  
Eric Norlander  
Mike Peake  
Ravi Ivan Sharma  
Doug Terrebonne  
Goffe Torgerson  
Stefan Trippler  
Dave Wyatt



# Frequently Asked Questions

The Poly Evolver is a very flexible instrument. While this provides a wide range of operational possibilities, it also means that you can put Evolver into a state where it doesn't seem to work. Here are some tips:

- **How do I save a Program or Combo?** Hit the WRITE switch. Then press the +/YES switch when prompted. All other switches are locked out, though you can hit the -/NO switch if you change your mind. You can change the Program and/or Bank and store in a different location using the knobs. You can also press COMPARE to check the sounds in the Program destinations.
- **When I change Programs, the Sequencer speed always stays the same.** Check the Global Prog Tempo parameter – if it is Off, then the speed is not updated when Programs change. Set it to On.
- **I can't get the filter to oscillate.** Check the 4/2/POLE switch – the filter only oscillates when in 4-pole mode. (The filter is in 4-pole mode when the 4/2/POLE switch is lit.)
- **I seem to be getting distortion in my output.** Assuming that Distortion and Output Hack are off, you are likely just overloading the signal somewhere. There are many signal sources in the Poly, and many sources of gain. If too many are used at levels that are too high, you will likely get some distortion. For example, if you are using all four oscillators, lower the LEVEL setting of each oscillator to the 40 – 60 range. Likewise, if using all three delay taps, lower the AMOUNT setting of each.
- **I can't hear the External Audio input.** In addition to increasing External In LEVEL, the filter and VCA must be open to hear the signal. You can initially turn up the Lowpass Filter FREQUENCY and the initial VCA LEVEL to hear the signal. The Peak Hold or Envelope Follower can be used to control the VCA or Filter level, or the sequencer can trigger the envelopes. There are many different ways to use different modulation sources to control the VCA and Filter when using external inputs.

# Chaining Multiple Evolvers Together

The Poly Evolver Keyboard has 4 voices that are identical to the 4 voices in a rackmount Poly Evolver, and the single voice in the original desktop Evolver. This compatibility enables you to chain multiple Evolvers together to increase polyphony, using your Poly Keyboard as a controller for all chained Evolvers.

Note that if the Poly Chain parameter is Off, the Poly Chain MIDI Output jack acts as a second MIDI Out jack.

## To chain a single Poly Rack to your Poly Evolver Keyboard:

1. Connect the Poly Chain MIDI output on the back of your Poly Evolver Keyboard to the MIDI In of the Poly Rack.
2. Connect the stereo outputs of the keyboard to the right and left Mix Inputs of the Rack, then connect the output of the Rack to your mixer/sound system.
3. On the Keyboard, in Global select the Poly Chain screen, and set it to the total number of voices you have chained, ie 8 for a keyboard and a rack in this case.
4. Next set the MIDI clock parameter to MIDI Out on the keyboard (or MIDI In/Out if using an external MIDI clock to drive the keyboard). On the Rack, select MIDI Clock In.

You should be all set to play! You can now virtually ignore the Rack, since the controls on the keyboard will control both units as if they were a single 8 voice. This includes saving a Program/Combo; if you save an edited program on the keyboard, it will also save the program on any Poly Chained instruments (updated with the latest revision software).

**Note:** Remember that if you change a Main parameter on the Keyboard, the Rack will change also. For example, changing MIDI channels on the Keyboard will also change the MIDI channels on the Rack, which is likely what you would want. There are a couple exceptions: if you change Poly Chain or MIDI clock, it is not chained, since these parameters are usually different in each unit.

While everything is transparent in Program mode, there are some differences in Combo mode operation. For example, Combos that have Mono parts will be handled differently. This is due to the fact that in Mono, Poly chain does not function, since the Part interprets new notes per the Key Mode (low note, last note, and so on), and does not re-transmit the notes. If, for example, you have a 1/3 split with Part 1 playing a mono Program, and Part 2 playing 3 voices polyphonically, with two Polys chained you will still only have a single mono voice in Part 1, but Part 2 will now be 6 voices. So, you will lose a voice in this configuration.

Other configurations work as you would expect; for example, if you have a Combo with 2 programs stacked, it will play them as a 4 voice with two Polys.

## Using Multiple Poly Racks

You can also chain more than a single Rack in the same manner. With two Racks, set the main parameter Poly Chain on the Keyboard to 12, and set Poly Chain on the first Rack to 8. The second Rack Poly Chain should be set to Off.

On the Keyboard MIDI clock is again set to Out, the first Rack set to In/out, and the second Rack to In.

## **Chaining Mono Evolvers**

You can also use one or more mono table-top Evolvers for more voices. If using one to get 5 voices (a magic number!), set the Keyboard to MIDI clock Out, and set Poly Chain to 5. Set the Evolver to MIDI Clock In.

## **A Note on Versions**

The same basic voice structure is used on all three instruments, the mono Evolver, the Poly Rack, and the Poly Keyboard. Though there has been great care to keep backwards compatibility, there have been a few changes necessary in both the mono Evolver and the Poly Rack to make them work more seamlessly with the keyboard.

As a result, you will likely have to update your current synths to be compatible. Please check our website to get the latest information on these updates.

# The Poly Evolver Voice

Before going through the individual parameters, following is a brief description of the architecture of a single Poly Evolver voice. The signal flow diagram on the next page is a good starting point for understanding how the Poly works.

## The Analog Side

The analog electronics for each voice consist of two identical (Left/Right) synth sections, each with an analog waveshape oscillator, a 2/4 pole resonant lowpass filter, and a Voltage Controlled Amplifier (VCA). Control voltages are generated by the processors to control the analog components.

## The Digital Side

Surrounding the Analog electronics is a high-speed Digital Signal Processor (DSP) that both pre- and post-processes the audio signal. Since the DSP also computes the control voltages for the analog circuitry, it can handle a wide range of modulation with high precision.

The DSP provides audio functions such as the Digital Oscillators, Envelope Follower, the Peak/Hold detector (and associated external trigger generator), Highpass filter, Distortion (with noise gate), Pan, Delay, and Hack. It also handles the tuned feedback, as well as the additional Delay feedback paths. And all the modulation calculations (envelopes, LFOs, routing, and so on).

Analog-to-Digital (A/D) and Digital-to-Analog (D/A) converters are used to connect the analog and digital sections. There are two sets of stereo converters running at a 48 kHz sampling rate with 24 bits of precision for minimum impact on the analog sound.

Each voice is completely independent, except that the single stereo external Audio In signal is routed to all four voices.

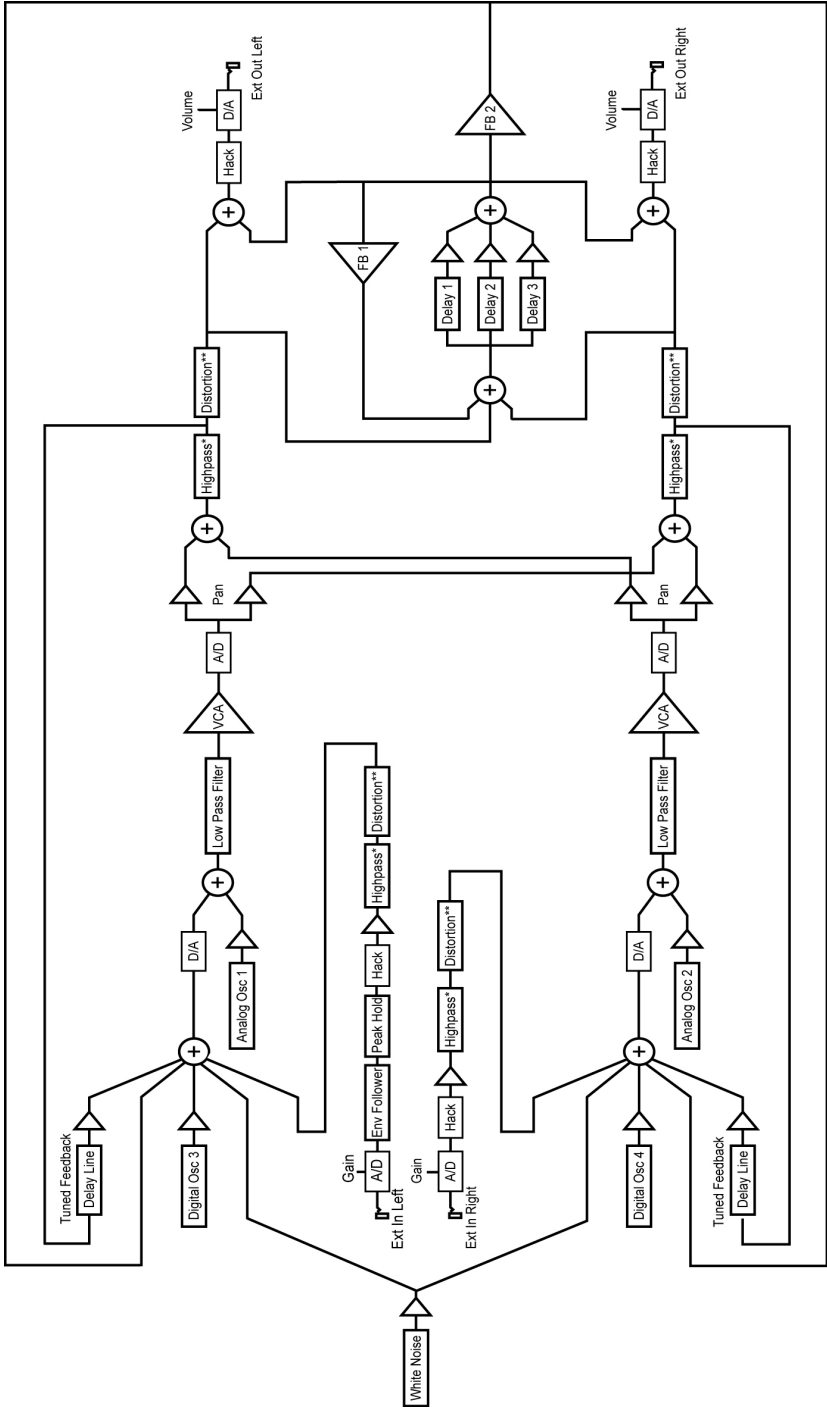
## Inputs and Outputs

There are several audio jacks on the rear panel. All are unbalanced stereo pairs (two mono jacks). First, there are the Audio Inputs, which can be routed to the input of any or all of the voices, for using the Poly as a signal processor.

Next, there are individual voice outputs for all 4 voices. When a plug is inserted into one of these jacks, that signal is disconnected from the mix output. This allows each channel to go to a different mixer channel for separate EQ/processing. It also allows the output of one voice to be routed to the Audio Input jacks, where it can then be routed to another voice's input for some interesting effects.

Next are the mixed Stereo Outputs. If you only use the Left/Mono jack, you will get a mono mix of both channels – but you really should use both channels! Finally, there is a stereo headphone jack on the rear panel.

**Note:** *Always turn down your mixer/amplifier volume when turning the Poly on or off to prevent pops!*



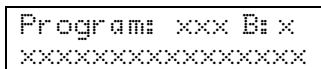
\* Highpass can be placed either before or after analog filter

\*\* Distortion can be placed either before or after analog filter

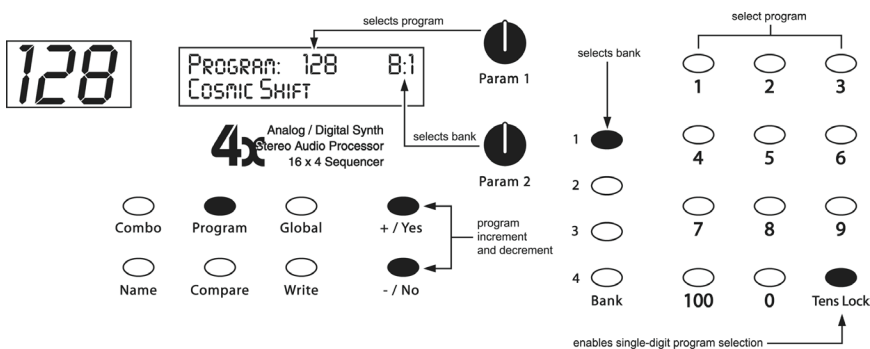
# Basic Operation

## Program Mode

When you first turn the Poly on, it is in Program Mode with the PROGRAM LED lit and the following screen active:



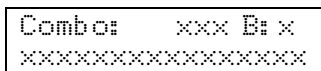
The top line shows the Program (1...128) and Bank (1...4) number of the currently selected Program, and the bottom line shows the 16-character name of the Program. The PARAM 1 knob changes the Program, and the PARAM 2 knob changes the Bank. The Program can also be incremented or decremented by pressing the +/YES or -/NO switch respectively or selected with the numeric program selection switches.



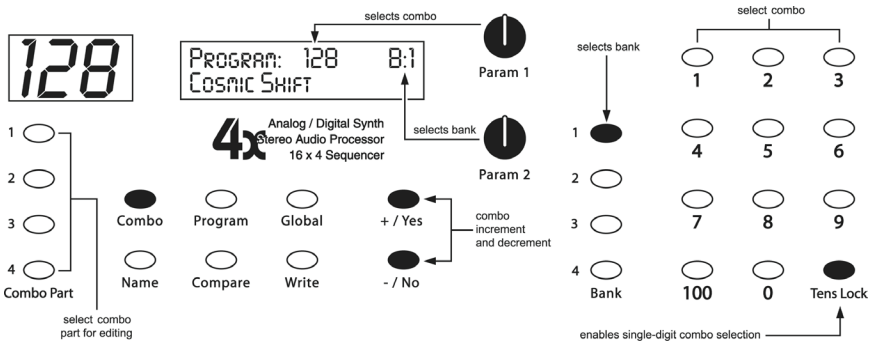
To edit a Program, simply turn any knob while in Program mode. See the Program Parameters section for a detailed list of all parameters and their functionality.

## Combo Mode

When you press the COMBO switch, the Poly switches to Combo Mode with the following screen active:



The top line shows the Combo and Bank number of the currently selected Combo, and the bottom line shows the 16-character name of the Combo. The PARAM 1 knob changes the Combo, and the PARAM 2 knob changes the Bank. To increment or decrement the Combo, press the +/YES or -/NO switch respectively.



To edit the Combo parameters, first hit the desired COMBO PART Switch. The PARAM 1 knob now selects the parameter, and the PARAM 2 knob changes the value. The + and – switches will increment/decrement the value also. See the Combo Parameters section for a detailed list of all parameters and their functionality.

### Saving a Program or Combo

To save a Program or Combo, press the WRITE switch and the following screen appears:

```
Write? P: xxx B: x
Hit: Yes or No
```

Press the +/YES switch to save the current Program or Combo, or -/NO (or the WRITE switch again) to cancel. To store in a different location, use PARAM 1 to select a new Program or Combo destination, and PARAM 2 for a different bank.

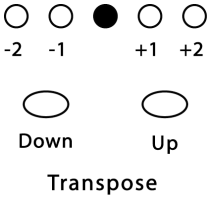
If there is another Poly Evolver or Evolver Poly Chained, and they have been updated to the latest software revisions, the program/combo will be saved in the chained units also.

**Compare Feature:** While editing a Program or Combo, you can press the COMPARE switch to listen to the original version. If you press the switch again, the Poly returns to the edited version.

**Audition Destination Feature:** While there is a write pending (see screen above), you can press the COMPARE switch to hear the target Program or Combo destination before saving. Just be sure to turn Compare off again before you actually hit the +/YES switch to save.

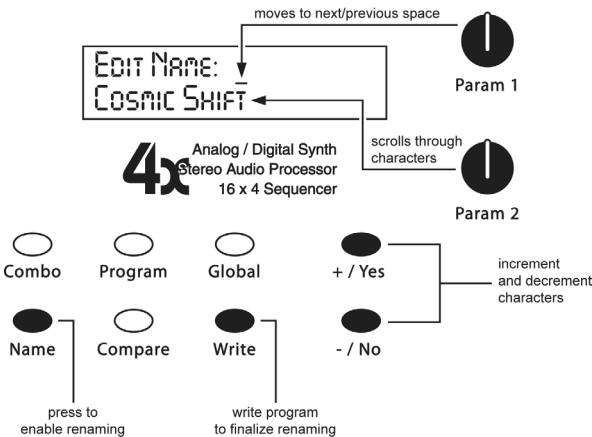
## Transposing the Keyboard Range

Use the UP and DOWN Transpose switches to transpose the Poly Keyboard up or down by octaves. The LED indicates the current keyboard transposition state. The transposition changes the MIDI note number of the keys, so MIDI notes sent will also be transposed. The transposition can also affect the key ranges in Combos.



## Renaming a Program or Combo

To rename a Program or Combo, press the NAME switch. The lower LCD line displays the name of the Program. The PARAM 1 knob selects which character is currently active, which is displayed by blinking the letter. The PARAM 2 knob changes the character.



## Voice Assignment

The Poly has a total of four voices, and as such uses a specific method for assigning them as keys are played. The scheme used by the Poly is a circular assignment; that is, as a new notes are received, the next unused voice is assigned to the new note. You can see how this works by watching the 4 voice LEDs as you play.

When all 4 voices are held and a new note is received, it is necessary to “steal” a voice to play the new note, since you always want to hear any new key hit. The algorithm used in the Poly steals the oldest note held of the 4 voices playing. This is done to be consistent; you can always predict which note will be stolen.

When in Combo mode, each Part acts as a separate mini-synthesizer, so the same voice assignment rules apply within the Part.



An exception to the voice stealing rule is when Poly Chain is On. In this case rather than stealing an already-used voice, the Poly will transmit the new note over MIDI so it can be played by another linked Poly.

### **Individual Voice Outputs**

The Poly has a pair of output jacks for each of the four voices on the back panel, allowing separate mixing/processing of each voice. When a plug is inserted in the jack, that signal is disconnected from the mix output.

Another trick is to route the output of one voice to the external audio inputs; then, in Combo mode, you can use one (or more) voices to process a different voice. Or take two different voice outputs (programmed in mono) and run one to the Left input and one to the Right input for even wilder results.

**Note:** *The individual outputs will normally be used in Combo mode only, where you have complete control over the individual voices.*

# Global Parameters

To edit the Global parameters, press the GLOBAL switch and Global page 1 is displayed. The PARAM 1 knob changes the parameter on the upper LCD line, and the PARAM 2 knob changes the lower parameter. The +/YES and -/NO switches select the other pages.

**Note:** *If you hold the -/NO switch while you hit the +/YES switch, it will jump to the last page. Similarly, if you hold the +/YES switch when you hit the -/NO switch, it will jump to the first page.*

**Note:** *When in Combo mode, some of the Global parameters will be overwritten by the Combo parameters.*

## Page 1:

```
Transpose:  xx
Fine Tune:  xx
```

**Transpose:** **-36...+36** – Master Transpose control, 0 is centered. Steps in semitones.

**Fine Tune:** **-50...+50** – Master Fine Tune control; 0 centered. Steps in cents (50 cents = ½ semitone).

## Page 2:

```
MIDI Channel: xx
Poly Chain:   xx
```

**MIDI Channel:** **ALL, 1...16** – Selects which MIDI channel to send and receive data, 1 to 16. All receives on any channel.

**Poly Chain:** **Off, 5...20** – Use this to link multiple Evolvers and Poly Evolvers into a system with more voices by intelligently processing the keys hit and passing MIDI data through to the Poly Chain MIDI out jack where it can be routed to another Evolver or Poly Evolver. Note that MIDI clocks are handled separately per the MIDI Clock parameter. Check page 10 for more details.

## Page 3:

```
Clock:  xxxxxxxx
Prog Tempo:  xx
```

**Clock:** **see table** – Selects the MIDI clock status, and enables External sequencer triggers, as follows:

Display	MIDI Clock Setting
Internal	MIDI clock is neither sent nor received
MIDI Out	MIDI clock is sent
MIDI In	MIDI clock is received
MidiIn/Out	MIDI clock is received and transmitted (use

	with Poly Chain)
MidInNoS/S	MIDI clock is received, but MIDI start/stop/continue messages are ignored.

**Prog Tempo: Off, On** – When set to Off, changing a Program or Combo will not change the tempo- this is useful for keeping a constant tempo but using different sounds. If set to On, a Program change will change the tempo to the BPM and Clock Divide values saved with the Program. When on, changing the main BPM will also change the Program BPM, and vice-versa. When off, changing one has no effect on the other.

Page 4:

Tempo (BPM): xxx  
 Clock Div: xxxxxxx

**Tempo: 30...250** – Sets the basic speed for the sequencer in BPM. Actual speed also depends on the Clock Divide setting. If using MIDI clock, it will display the BPM of the incoming MIDI clocks. If Prog Tempo is On, the Tempo and Clock Divide will both be updated on every Program or Combo change.

**Clock Divide: see table** – Used as a clock divider to provide a wider range of sequencer speeds. When set to Quartr (quarter notes), the BPM setting is exact, i.e. 120 BPM = 120 BPM. If set to Half (half note), the actual speed is half, so a setting of 120 BPM will actually play at 60 BPM.

Swing settings add a delay to every the odd steps (1, 3, 5, and so on), while shortening the even steps by the same amount, for a swing feel to the timing. Half swing is the same with less delay.

Here are all the possible settings, with the effect on the overall tempo:

Display	Tempo	Timing Division
Half	BPM/2	Half note
Quartr	BPM	Quarter note
Eighth	BPM x 2	Eighth note
8 half	BPM x 2	Eighth note, half swing timing
8swing	BPM x 2	Eighth note, full swing timing
8 trip	BPM x 3	Eighth note triplets
16th	BPM x 4	Sixteenth note
16half	BPM x 4	Sixteenth note, half swing timing
16swing	BPM x 4	Sixteenth note, full swing timing
16trip	BPM x 6	Sixteenth note triplets
32nd	BPM x 8	Thirty-second note
32trip	BPM x 12	Thirty-second note triplets
64trip	BPM x 24	Sixty-fourth note triplets

Page 5:

```
MIDI Program: xxx
MIDI Pressure: xx
```

**MIDI Program: Off, On** – When On, the Poly will respond to MIDI program changes received, and will transmit Program changes to MIDI Out.

**MIDI Pressure: Off, On** – When On, the Poly will respond to MIDI pressure (aftertouch) received, and will transmit Keyboard Pressure to MIDI Out.

**Page 6:**

```
MIDI Control: xxx
MIDI SysEx: xx
```

**MIDI Control: Off, On** – When On, the Poly will respond to MIDI controllers, and will transmit controllers from the keyboard to the MIDI Out. Controllers include Pitch Wheel, Mod wheel, Pedal 1, and pedal 2.

**MIDI SysEx: Off, On** – When On, the Poly will respond to MIDI SysEx messages, and will transmit them from the keyboard to the MIDI Out. Note that all knobs/parameters on the keyboard are sent as SysEx messages when enabled.

**Page 7:**

```
Input Gain: xxxxx
LCD Contrast: xx
```

**Input Gain: 0db... 24d** – Provides extra gain on the Left and Right External Inputs. You can select no gain (0 dB), or a gain in steps of 3 dB up to 24 db.

**LCD Contrast: 1...100** – This sets the contrast level for the LCD. Normally it will be around 15.

**Page 8:**

```
Pedal 1: xxxxxxxx
Pedal 2: xxxxxxxx
```

**Pedal 1: see table** – Sets the destination for the Pedal/CV1 input. Note that this input is heavily filtered for clean operation, so there is a limit to the speed it will respond to an external control voltage.

**Pedal 2: see table** – Same for Pedal/CV 2.

Display	Pedal Routing
FootCtrl	Routed to the Foot Control Modulation
Breath	Routed to the Breath Control Modulation
Expressn	Routed to the Expression Modulation
Volume	Controls Master Volume
LpFilter	Routed to the low pass filter

LpF Half

Routed to the low pass filter, but with half the range

**Page 9:**

```
Velocity Curve: x
Pressure Curve: x
```

**Velocity Curve: 1...4** – Sets one of the four velocity curves for the keyboard; this gives you the ability to adjust the keyboard to your playing style.

**Pressure Curve: 1...4** – Sets one of the four pressure curves for the keyboard; this gives you the ability to adjust the keyboard to your playing style.

**Page 10:**

```
LocalControl: xxx
DamperPolarity: x
```

**Local Control: Off, On** – Enables or disables the internal connection between the keyboard and panel controls and the synth electronics. This is useful with external sequencer operation.

**DamperPolarity: -, +** – For compatibility with different sustain (Damper) pedals connected to the Sustain jack on the rear panel. Use + for normally Open switches, and use – for normally closed switches.

**Page 11:**

```
Dump: (Hit S/S)
xxxxxxxxxxxxxxxxxxxx
```

**MIDI Dumps: see table** – Allows dumping of Programs and Combos over MIDI in a number of ways.

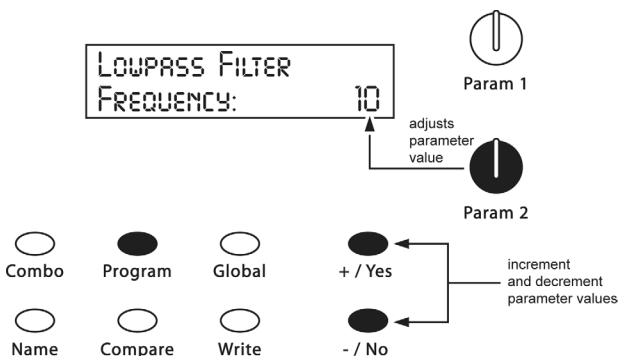
Display	MIDI Transmit Operation
Single Program	Send current program
Program Bank	Send all 128 programs in current bank
All Program Banks	Send all programs in all four banks
Single Combo	Send current combo
Combo Bank	Send all 128 combos in current bank
All Combo Banks	Send all combos in all three banks
Everything	Sends the whole banana (all of the above)

When this screen is active, the sequencer START/STOP LED will start blinking. When the START/STOP switch is hit, the transmission will start. It is handy for saving Programs on a computer or sending to another Poly. The dumps include Program and Bank numbers, so when received it will be stored in the same location.

# Program Parameters

All Program parameters can be edited using the front panel controls. To edit a program, simply turn the desired parameter knob. The selected parameter and value appears in the LCD display.

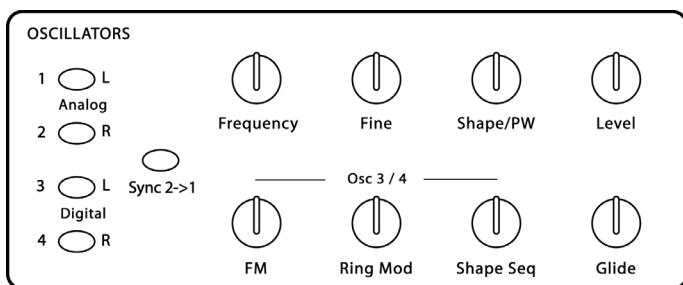
After a parameter is selected by turning its knob, you can also use the PARAM 2 knob to change the value of the selected parameter. The +/YES or -/NO switches incrementally adjust parameter values as well.



Following are descriptions of each Poly Evolver Program Parameter.

## Oscillators

There are four oscillators per Poly Evolver voice. To select a particular oscillator for editing, press the appropriate oscillator switch, 1–4. Turning a knob will then adjust the parameters of the selected oscillator. Holding one of the four switches will solo that oscillator (the switch will blink) by setting the levels of the other three to zero. It does not affect any modulation that is routed to oscillator level, though, so at times it may not completely turn off all other levels.



### Oscillators 1 and 2

Oscillators 1 and 2 are analog oscillators. Oscillator 1 is hardwired to the Left channel; Oscillator 2 is hardwired to the Right channel.

**Note:** There are additional modulation controls that affect Oscillators 1 and 2. These are covered in other sections of the Parameter definitions.

**Frequency: C -2...C 8** – Selects the base oscillator frequency over a 10 octave range, from 8 Hz to 8KHz, stepping in semitones. C3 is middle C, the first octave is -2 (C-2, C#-2, and so on), the second octave is -1 (C-1, C#-1, and so on), the third is zero (C 0, C# 0...), and so on.

**Fine: -50...+50** – Fine Tune control; 0 centered. Steps in cents (50 cents = ½ semitone).

**Shape/PW: see table** – Selects the analog waveshape as follows:

Display	Waveshape
Sawtooth	Sawtooth
Triangle	Triangle
Saw-Tri	Sawtooth – Triangle mix
Pulse xx	Pulse Wave, with pulse width ranging from minimum (0) to maximum (99). The pulse width will turn off at the two extremes – this allows some interesting modulation possibilities. A square wave will be around P50.

**Level: 0...100** – Sets the volume of the selected Oscillator.

**Glide: Normal 0...100; Finger 02...Finger 100; Keybd Off** – Sets the Oscillator Glide rate. Glide can be set independently for each oscillator. Low settings are faster. Normal Glide covers the range from 1 to 100 (0 is no glide). A “fingered” mode that only glides when more than one note is held down is selected by setting glide over 100, where it ranges from Finger 02 to Finger 100 (equivalent to glides of 2 to 100).

**Note:** *If you set glide all the way to maximum, it goes to Keybd Off, which has the effect of disconnecting the selected oscillator from the keyboard.*

**Note:** *Fingered Glide only works in Mono or Unison key assign modes.*

**Sync 2-> 1** – When enabled (lit), turns oscillator hard sync on. With sync on, whenever oscillator 2 resets, it will also reset oscillator 1 for the classic hard sync sound.

## Oscillators 3 and 4

Oscillators 3 and 4 are digital waveshape oscillators. Oscillator 3 is hardwired to the Left channel; Oscillator 4 is hardwired to the Right channel. Like the original Prophet VS, the digital oscillators in Evolvers get quite trashy at higher frequencies.

**Frequency: C -2...C 8** – Selects base frequency over a 10 octave range, from 8 Hz to 8KHz, stepping in semitones. C3 is middle C, the first octave is -2 (C-2, C#-2, and so on), the second octave is -1 (C-1, C#-1, and so on), the third is zero (C 0, C# 0...), and so on.

**Fine: -50...+50** – Fine Tune control; 0 centered. Steps in cents (50 cents = ½ semitone).

**Shape/PW: 1...128** – Selects a digital waveshape. Waveshapes 1 - 95 correspond to ROM (preset) Waveshapes 32 – 125 in the Prophet-VS. Waveshapes 96 – 128 are user programmable in the Poly via MIDI. In the VS, the user waves were 0 - 31, and wave 127 was noise, which is not included in the Poly since the noise source is separate from the oscillators. Wave 95 (126 on the VS) is a “blank” wave, which can

give some options while sequencing waves. The Poly is shipped with waves 96 – 128 the same as 1 – 31. The user waves can be changed using the software Editor.

**Level: 0...100** – Sets the volume of the selected Oscillator.

**Glide: Normal 0...100; Finger 02...Finger 100; Keybd Off** – Sets the oscillator Glide rate. Glide can be set independently for each oscillator. Low settings are faster. Normal Glide covers the range from 1 to 100 (0 is no glide). A “fingered” mode that only glides when more than one note is held down is selected by setting glide over 100, where it ranges from Finger 02 to Finger 100 (equivalent to glides of 2 to 100).

*Note: If you set glide all the way to maximum, it goes to Keybd Off, which has the effect of disconnecting the selected oscillator from keyboard.*

*Note: Fingered Glide only works in Mono or Unison key assign modes.*

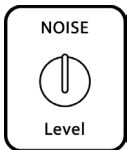
**FM: 0...100** – Sets the amount of Frequency Modulation. If Oscillator 3 is selected, FM is applied to Oscillator 3 from Oscillator 4. If Oscillator 4 is selected, FM is applied to Oscillator 4 from Oscillator 3. Note that each digital oscillator can FM the other at the same time for some wild results.

**Ring Mod: 0...100** – Sets the amount of Ring (Amplitude) Modulation. If Oscillator 3 is selected, Ring Modulation is applied to Oscillator 3 from Oscillator 4. If Oscillator 4 is selected, Ring Modulation is applied to Oscillator 4 from Oscillator 3. Note that each digital oscillator can Ring modulate the other at the same time.

*Note: If the Ring Mod amount is turned up, you will get output from the Oscillator even if the Oscillator Level is set to zero.*

**Shape Seq: Off, Seq1...4** – This parameter allows sequencing Waveshapes. Off if not in use, otherwise select one of the four sequences Seq 1, Seq 2, Seq3, or Seq 4 to change the waveshape on every sequence step. In other words, if sequence 1 is selected, with step 1 = 10 and step 2 = 5, then waveshape 10 will play in the first step, and waveshape 5 will play in the second.

## Noise



**Level: 0...100** – Controls the volume of white noise mixed into the filter. The same amount goes into both channels.

## External In

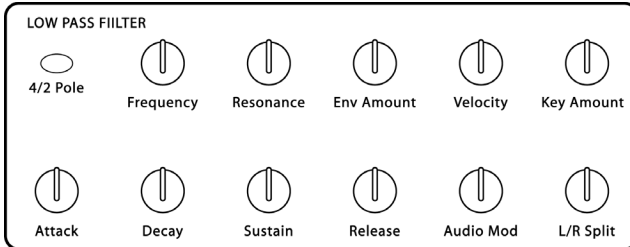




**Level: 0...100** – Controls the volume of external audio input connected to the Left and/or Right Audio Input jack on the back of the Poly Evolver Keyboard. The same signal is routed to all four voices.

**Note:** Use the *External Audio input type parameter in the Misc Parameters section to choose the input mode.*

## Lowpass Filter



The analog (*real* analog!) lowpass filter is actually two different filters; one for the Left channel and one for the Right channel. This allows true stereo processing of external audio signals run through Evolver. However, for simplicity and consistency the two filters are normally driven together in tandem, so they normally respond the same way.

Exceptions are when using the SPILT parameter, and when using the separate filter cutoff and resonance modulation destinations, which allow the two filters to be modulated independently. Note that though they are normally controlled together, since they are analog there will always be some subtle differences between the two filters, which gives the Poly Evolver a more natural sound.

**4/2 Pole:** – Selects either 2- or 4-pole operation for the filter. (The filter is in 4-pole mode when the 4/2/POLE switch is lit.)

**Frequency: 0...164** – Sets the base filter cutoff frequency over more than 13 octaves. There is special smoothing on the operation of the filter knob to eliminate stepping as you turn the knob for clean manual filter sweeps.

**Resonance: 0...100** – Sets the Resonance level of the filter. At high settings the filter will self-oscillate in 4-pole mode. If the filter does not oscillate, make sure that 4 pole mode is selected. (The filter is in 4-pole mode when the 4/2 POLE switch is lit.)

**Env Amount: -99...+99** – Sets the amount of filter envelope to the cutoff frequency. This can be positive or negative, allowing inverted envelope control of the filter.

**Velocity: 0...100** – Amount of MIDI velocity controlling the level of the filter envelope.

**Key Amount: 0...100** – Sets the amount of keyboard (MIDI note) to the filter cutoff. A setting of 72 will step the filter one semitone for each MIDI note, 36 would be half-semitones, and so on. Also, the MIDI note is derived using Oscillator 1 Glide, allowing Glide tracking.

**Attack: 0...110** – Sets the Attack time of the filter ADSR envelope generator

**Decay: 0...110** – Sets the Decay time.

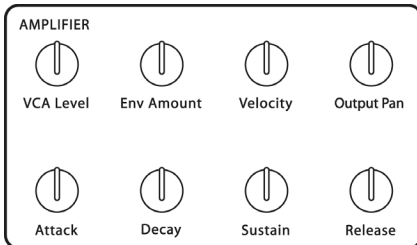
**Sustain:** 0...100 – Sets the Sustain level.

**Release:** 0...110 – Sets the Release time.

**Audio Mod:** 0...100 – Sets the amount of audio modulation from the analog oscillator to the filter, separate in left and right channels; i.e. Oscillator 1 modulates the left filter, and Oscillator 2 mods the right filter.

**L/R Split:** 0...100 – Split separates the cutoff of the left and right filters by raising the left and lowering the right. Normally the filters track in both channels, so this parameter provides a way to unlock them.

## Amplifier



**VCA Level:** 0...100 – Sets a base level for the VCA (Voltage controlled Amplifier). This allows the VCA to be essentially bypassed, which may be necessary for processing external audio signals, or for Programs that drone.

**Note:** If VCA Level is on full, Envelope Amount has no effect.

**Env Amount:** 0...100 – Sets the amount of VCA envelope to the VCA level.

**Velocity:** 0...100 – Sets the amount of MIDI velocity controlling the level of the VCA envelope.

**Attack:** 0...110 – Sets the Attack time of the VCA ADSR envelope generator.

**Decay:** 0...110 – Sets the Decay time.

**Sustain:** 0...100 – Sets the Sustain level.

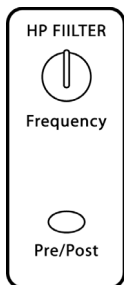
**Release:** 0...110 – Sets the Release time.

**Output Pan:** see *table* – Sets output panning. This affects the feedback; it allows signal from one channel to feedback into the other, for example.

Display	Output Pan Selection
LxxxxR	Stereo 1 – Left channel panned fully left, Right fully to the right
xLxxRx	Stereo 2 – Left channel panned mostly left, Right mostly to the right
xxLRxx	Stereo 3 – Left channel panned somewhat left, Right somewhat to the right
xMonox	Mono – Both channels mixed to the center – also useful

	when only using one output
xxRLxx	Reverse Stereo 1 – Right channel panned somewhat left, Left somewhat to the right
xRxxLx	Reverse Stereo 2 – Right channel panned mostly left, Left mostly to the right
RxxxxL	Reverse Stereo 3 – Right channel panned fully left, Left fully to the right

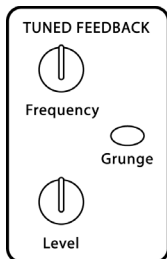
## High Pass Filter



**Frequency: 0...99** – Sets the cutoff frequency of the four-pole highpass filter. When the PRE/POST switch is on (lit), the highpass filter is inserted before the analog lowpass filter, and only affects external audio input. When the PRE/POST switch is off (unlit), the highpass filter is placed after the analog lowpass filter and VCA (but before the Delay) and filters the Evolver's audio accordingly. Refer to the Signal Flow diagram on page 13 for details on the signal path. There are two separate highpass filters, one for each channel, and they are controlled in tandem.

Remember that any of the modulation sources can be routed to control the Highpass Filter. For example, Envelope 3 can be dedicated to the Highpass.

## Tuned Feedback



Feedback is implemented via two identical tuned delay lines, one for each channel. See the diagram on page 13 for details on the signal path. Since the delay is tuned, it can be played by modulating the feedback frequency, from the sequencer or other sources.

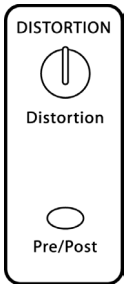
**Note:** Feedback can also be used to implement plucked string physical models. Use Envelope 3 with Noise as a destination (all oscillators off). Play around with different Feedback Levels, and adjust the filter cutoff frequency.

**Frequency: 0...48** – Sets the base frequency of the main feedback loop. It steps in semitones from C0 to C4 (0 – 48) for a four octave range. The exact frequency is influenced by other factors, such as the filter frequency and number of poles, which can drive it slightly sharp or flat.

**Level: 0...100** – Sets the level of feedback. As the level goes up, the feedback will eventually oscillate at the set Frequency. Medium levels of feedback add depth and movement to the sound.

**Grunge: OFF...On** – When on, it enables nasty feedback at higher levels. It has no effect at lower levels of feedback.

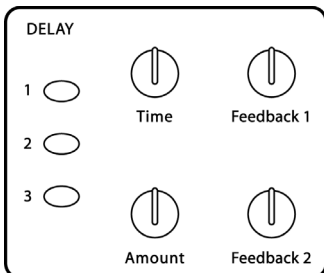
## Distortion



**Distortion: 0...99** – Sets the amount of distortion. There are two separate distortions, one for each channel. When the PRE/POST switch is on (lit), the distortion is introduced before the analog filter, and only affects external input. When the PRE/POST switch is off (unlit), the distortion is introduced after the analog filter, VCA, and Highpass, but before the Delay.

**Note:** There is a built-in noise gate that is enabled when distortion is not zero. If you want to use the noise gate but without distortion, use a distortion setting of 1. The noise gate uses the Left channel signal level to gate both channels.

## Delay



The delay takes a mix of both channels as input, and provides up to three independent taps, each of which can be individually time or level modulated. To select a delay tap for editing, press the appropriate Delay switch, 1–3. Turning a knob will then adjust the parameters of the selected Delay tap. Holding one of the three switches will solo that delay (the switch will blink) by setting the levels of the other two to zero. It does not affect any modulation that is routed to delay level, though, so at times it may not completely turn off all other levels.

The outputs of the three taps are mixed and summed with the Left and Right channels. The delay output also can be mixed back to the input of the delay for more ambience, repeating delays, or tuned feedback if the feedback level is set high.

A second feedback path takes the delay output and routes it back to the input of the analog filter. This path can be used for more extreme feedback effects.

**Note:** *If all three Delay taps are in use, the Levels of each should be set to lower amounts to prevent overload distortion.*

**Time: 0...150, sync** – Sets the delay time of the selected delay tap. A setting of 0 - 150 will adjust the delay from zero to 1 second at 16 bits 48KHz sampling, no compression. The middle range steps are in tuned semitones (noticeable with Feedback 1 turned up high). Since delay is a time measurement, higher delay numbers are lower frequencies. Step 22 corresponds to C7 (2,093 Hz), down to step 94 which is tuned to C1 (32.7 Hz).

After 150 the sync delay times are as shown in the table below. The delay time can be set in multiples of a single sequencer step, or exact divisions of a step.

**Note:** *Depending on the current sequence speed, the longer sync delays may not be reachable. For example, at Tempo of 60 BPM and Clock Divide of Quatr (quarter note) each beat takes one second, so if you set it to 2 Steps (Delay is 2 steps in length), the delay should be two seconds. But, there is only enough memory for one second of delay, so it will not work. When too slow as in this case, simply clamping it at one second would not likely be a multiple of the step time. So, if the requested time is too long, the requested time is cut in half until it fits within the one second of available memory. So, don't be surprised if changing longer sync delay times does not make any difference to the sound.*

Display	Timing Sync
32 Steps	Delay is 32 steps in length
16 Steps	Delay is 16 steps in length
8 Steps	Delay is 8 steps in length
4 Steps	Delay is 4 steps in length
2 Steps	Delay is 2 steps in length
1 Step	Delay is 1 step in length
1/2 Step	Delay is one-half step in length
1/4 Step	Delay is one-quarter step in length
1/8 Step	Delay is one-eighth step in length
1/16Step	Delay is one-sixteenth step in length
6 Steps	Delay is 6 steps in length

3 Steps	Delay is 3 steps in length
1.5 Step	Delay is one and a half steps in length
2/3 Step	Delay is two-thirds of a step in length
1/3 Step	Delay is one-third step in length
1/6 Step	Delay is one-sixth step in length

**Amount: 0...100** – Sets the delay amount of the selected delay tap. The left and right channels are mixed into a single delay.

**Feedback 1: 0...100** – Sets the amount of feedback from the summed output of all the delay taps to the input of the delay.

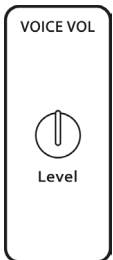
**Feedback 2: 0...100** – Sets the amount of feedback from the summed output of all the delay taps to the input of the filter for more extreme effects.

## Output Hack



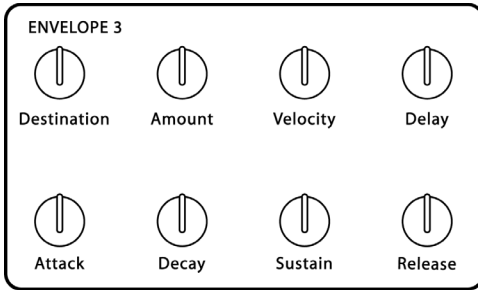
**Amount: 0...14** – Trashes the output signal, quite rudely.

## Voice Vol



**Level: 0...100** – Sets the voice volume; usually used for matching volumes between Programs.

## Envelope 3



**Destination:** *see table* – Sets the Envelope 3 destination. See the Modulation Destination table on page 41 for a list of possible destinations.

**Amount:** *-99...+99* – Sets the amount of Envelope 3.

**Velocity:** *0...100* – Sets the amount of MIDI velocity controlling the level of envelope 3.

**Delay:** *0...100* – Sets the delay time of Envelope 3, prior to Attack.

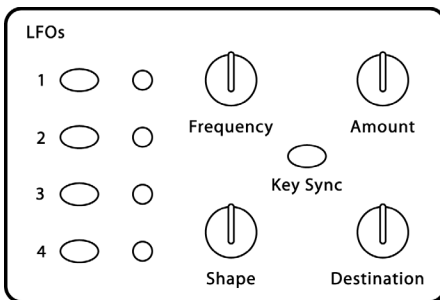
**Attack:** *0...110* – Sets the Attack time of Envelope 3.

**Decay:** *0...110* – Sets the Decay time.

**Sustain:** *0...100* – Sets the Sustain level.

**Release:** *0...110* – Sets the Release time.

## LFOs



The Poly Evolver has four identical Low Frequency Oscillators (LFOs). To select a specific LFO for editing, press the appropriate switch, 1–4. Turning a knob will then adjust the parameters of the selected LFO. Holding one of the four switches will solo that LFO (the switch will blink) by setting the Amounts of the other three to zero. It does not affect any modulation that is routed to LFO Amounts, though, so at times it may not completely turn off all other Amounts.

**Frequency: 0...150, sync** – Sets the LFO frequency. Range 0–150 for unsynced LFO; speed ranges from slow (30 seconds) to very fast – at 90 (8 Hz, C-2) and above the speed steps in semitones, up to 150 (261 Hz, middle C).

**Note:** *Some of the analog functions may not respond well to the fastest LFO speeds, due to speed limitations of the control voltages; but they will certainly generate some interesting sounds.*

Above 150, the sync speeds as follows:

Display	Timing Sync
32 Steps	Sequence speed divided by 32; i.e. one LFO cycle takes 32 steps
16 Steps	Sequence speed divided by 16
8 Steps	Sequence speed divided by 8
4 Steps	Sequence speed divided by 4
2 Steps	Sequence speed divided by 2
1 Step	One cycle per step
1/2 Step	Two cycles per step
1/4 Step	Four cycles per step
1/8 Step	Eight cycles per step
1/16Step	Sixteen cycles per step

**Shape: see table** – Selects the LFO waveshape:

Display	LFO Shape
Triangle	Triangle
Rev Saw	Reverse Sawtooth
Sawtooth	Sawtooth
Square	Square Wave
Random	Random – changes once per cycle for sample-and-hold effects

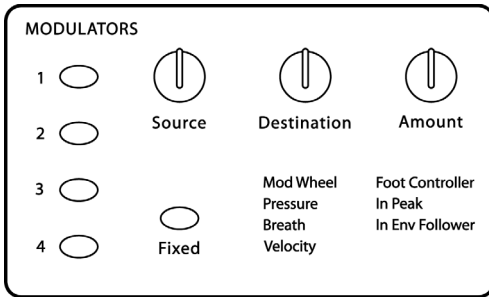
**Amount: 0...100** – Sets the amount of LFO routed to the destination.

**Key Sync:** When this switch is enabled (lit) the Poly Evolver re-starts the LFO each time a new note is played (Key Sync). Each LFO can be set independently.

**Destination: see table** – see the Modulation Destination table on page 41 for a list of possible destinations.



## Modulators



The Modulators section lets you configure the modulation routing and amount for the Poly Evolver's four general-purpose modulation slots as well as for MIDI controllers such as the Mod Wheel, Key Pressure, Velocity, Breath Control, and more.

Since each Evolver mod source has a single destination, the four general purpose Mods provide a way to send a mod source (such as a sequence or LFO) to additional destinations, with a different amount. There are also additional mod sources available here, such as noise and the digital oscillators, allowing a wide variety of possibilities, such as audio-rate modulation. While some destinations may not be able to keep up with audio-rate modulation, you will certainly be able to generate interesting sonic results.

To configure a general-purpose modulation slot, press the appropriate switch, 1–4, and use the Source, Destination and Amount knobs to set the modulation as desired. Holding one of the four switches will solo that Mod (the switch will blink) by setting the Amounts of the other three to zero. It does not affect any modulation that is routed to Mod Amount, though, so at times it may not completely turn off all other Amounts.

To configure modulation for a controller, press the FIXED switch, select the desired controller with the Source knob, then use the Destination and Amount knobs to set its modulation.

The Breath and Foot Controller parameters can be controlled by the Pedal/CV 1 and 2 inputs on the rear panel. This gives you the ability to route them to different parameters on each Program for more flexible control.

The In Peak fixed source takes the momentary peak of the left external audio input, and uses it as a modulation signal. The In Env Follower generates an envelope from the Left external audio input, and uses it as a modulation signal.

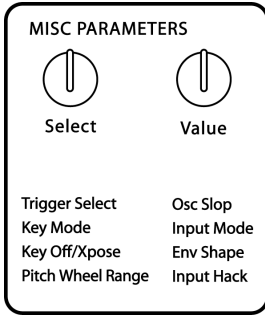
**Source 1: see table** – Selects a modulation source. See the list on page 43 for possible sources.

**Note:** *General-purpose mod slot Sources are not filtered, so a MIDI controller going through this route will react quicker, but may produce stepping noise, depending on the controller. For filtered (smoothed) MIDI controller operation, use the direct Pressure, Mod Wheel, Breath Control, or Foot Control parameters in the Fixed mods.*

**Amount 1: -99...+99** – Sets the amount of modulation.

**Destination 1: see table** – Selects a modulation destination. See the Modulation Destination table on page 41 for a list of possible destinations.

## Misc Parameters



The Misc Parameters section lets you configure a variety of parameters not found elsewhere. The parameter list is printed on the panel as seen above.

**Trigger Select: see table** – Selects the source of triggers/gates for the envelope generators. In the Poly (different from the Evolver) some of the Trigger modes will automatically turn the Sequencer on. This allows gated-sequence Programs to be played without having to manually hit the START/STOP switch. The Trigger modes that do this are marked in the table as **AUTO**.

Display	Envelope Trigger Selections
Sequencer or Key	The envelopes will be triggered by either the sequencer or the keyboard. When triggered by the sequencer, the gates are on for half the step time. Simply adjust the envelope parameters (ADSR) for the desired effect.
Sequencer Only	The envelopes will be triggered by only the sequencer.
Keyboard Only	The envelopes will be triggered by the keyboard only.
Key, Resets Seq	The envelopes will be triggered by the keyboard, and the sequencer will be reset on every key (if it is running). The sequencer will not trigger the envelopes.
Key, Gates Seq	Gated mode – the envelopes will be triggered by the sequencer when a key is held; in other words the keyboard will gate the sequencer. <b>AUTO</b>
KeyGates Seq Rst	Gated mode, reset – same as Gated mode, except every time a key is hit, the sequencer is reset to step 1. <b>AUTO</b>
Ext Audio Input	The envelopes are gated by the Left external audio input signal level, in other words, when the signal gets above a fixed threshold, the envelopes start. The envelopes then go into the release phase when the

	signal level drops below a second fixed threshold.
Ext In, ResetsSeq	Same as external in, but also resets the sequencer to step 1 if it is running.
Ext In, Gates Seq	External In signal will gate the sequencer. <b>AUTO</b>
Ext In GateSeqRst	External In signal will gate the sequencer, and also resets the sequencer to step 1 on each new gate. <b>AUTO</b>
Key GatesSeqOnce	Plays a sequence once (according to the length of Sequence 1) when a key is hit. The sequence is not restarted on multiple keys until it finishes and stops. <b>AUTO</b>
Key GateSeqOnceR	Also plays a sequence once when a key is hit, but will re-start the sequence on each key hit. <b>AUTO</b>
Ext In Steps Seq	Plays one step of the sequencer on each External Input audio trigger. <b>AUTO</b>
Key Steps Seq	Plays one step of the sequencer on each key hit. <b>AUTO</b>

**Key Mode: Poly, Mono, Unison 1, Unison 2; see table** – Selects the key mode when playing on the keyboard. There are 4 groups of key modes: Poly, Mono, Unison 1, and Unison 2. Each mode has 6 basic key modes as seen in the table. Poly is for normal polyphonic playing; in Program mode and Poly, the six key modes will have no effect, though they will in Combo when set to Mono.

Mono will only play one voice in Program mode. Unison will play all four voices together for a very thick sound. Unison 2 has more detuning between the voices than Unison 1.

**Note:** For quick key mode changing while playing in Program mode, the four Combo Part switches will select between Poly, Mono, Unison 1, and Unison 2 modes when switches 1-4 are hit respectively.

Display	Keyboard mode
Low Note	Low note priority
LowRetrig	Low note priority, re-trigger envelopes
HighNote	High note priority
HighRetrig	High note priority, re-trigger envelopes
LastNote	Last note hit priority
LastRetrig	Last note hit priority, re-trigger envelopes

**Key Off/Xpose: Off, -36...+36** – Enables and transposes the keyboard. If set to Off, the keyboard note values are ignored. Otherwise, it transposes the keyboard from -36 to +36 semitones (+/- 3 octaves). It is usually set to -24 or -36 to be in the best range for both the keyboard and the sequencer.

**Note:** When set to Off, the Poly will not respond to the keyboard.

**Another Note:** This parameter is useful to help balance oscillator pitch ranges between the keyboard and the sequencer. For example, if you make a Program using the sequencer, you will likely set the Oscillator frequencies up to the desired

*pitch range. But, if you then try to play this Program from a keyboard, the pitches will likely be too high. Rather than lowering all the oscillator frequencies (which would mess up the sequence!) you can simply use the transpose here.*

**Pitch Wheel Range: 0...12** – Sets the Pitch Bend Range of the Pitch Wheel, in semitones.

**Osc Slop: 0...5** – The amount of random oscillator frequency slop. The analog and digital oscillators in Evolver are very accurate, and will not drift. This works great for accurate sounds, and allows precise de-tuning. The Oscillator Slop parameter allows subtle amounts of frequency drift. For larger amounts, use a random LFO or white noise mod.

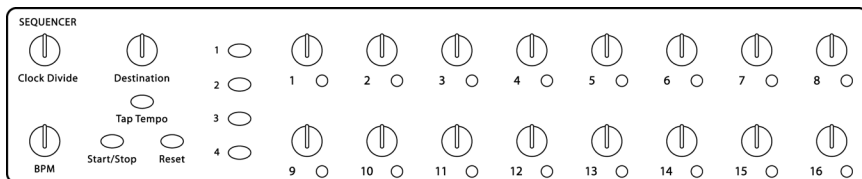
**Input Mode: see table** – Selects the external signal input mode. Note that the same signal goes to all four voices; this can be useful in Combo mode to do multiple parallel processing of an external audio signal. Or, the output of one voice can be routed to the input of another voice.

Display	External Audio Input Mode
Stereo	The left channel in goes to the left channel, right to right.
Mono Left	The left channel in goes to both channels (mono in).
Mono Right	The right channel in goes to both channels (mono in).
LCon RAudio	A mono audio signal is input to the Right Input; and a separate control audio signal (for envelope follower, peak hold, and clock source) into the Left Input. This allows one audio signal to control another for gating, filtering etc.

**Env Shape: Exponential, Linear** – Selects whether all three envelopes have a linear (straight line) shape, or exponential (curved). Exponential is the more natural of the two.

**Input Hack: 0...14** – Trashes the external input signal, quite rudely. But, the analog filter tames it nicely. A good way to mess up a clean stereo signal.

# Sequencer



The Poly Evolver features a 4 x 16 “analog-style” step sequencer that can generate four separate sequences of up to 16 steps each. Individual sequences can be routed to any standard modulation destination (see the table on page 41). Using VCA Envelope as a destination, for example, varies the volume of each step; a destination of Filter or Filter Envelope Amount will produce different filter settings per step. Typically, however, at least one sequence is routed to an oscillator to control pitch.

The sequencer can be triggered in a variety of ways, including via its own internal clock, by the keyboard, or with an external audio signal.

**BPM: 30...250** – Sets the programmed basic speed for the sequencer in BPM. When “Prog Tempo” is set to On in the Global Parameters menu, changing this parameter also changes the master BPM, and vice-versa. When Off, changing this parameter has no effect.

**Tap Tempo** – Lets you tap in a tempo. If the sequencer is Off, hit the Tap Tempo four times, and on the fifth hit the sequencer will start with the speed set according to the timing of the taps. If you keep hitting it, or otherwise hit it while playing, the sequence speed will change to match the tap speed. You can use this to speed up or slow down a sequence by continually hitting the switch.

**Clock Divide: see table** – Provides a wider range of sequencer speeds. When “Prog Tempo” is set to On in the Global Parameters menu, changing this parameter also changes the master Clock Divide, and vice-versa. When Off, changing this parameter has no effect.

Display	Tempo	Timing Division
Half	BPM/2	Half note
Quartr	BPM	Quarter note
Eighth	BPM x 2	Eighth note
8 half	BPM x 2	Eighth note, half swing timing
8swing	BPM x 2	Eighth note, full swing timing
8 trip	BPM x 3	Eighth note triplets
16th	BPM x 4	Sixteenth note
16half	BPM x 4	Sixteenth note, half swing timing
16swing	BPM x 4	Sixteenth note, full swing timing
16trip	BPM x 6	Sixteenth note triplets
32nd	BPM x 8	Thirty-second note
32trip	BPM x 12	Thirty-second note triplets

## Programming a Sequence

Each of the 16 steps in the sequence has its own knob, which can be set to a value from 0-100. Turning a Step knob past 100 sets the step to “Reset.” Reset is useful for creating a sequence of fewer than 16 steps. For example, if you want to create a four step sequence, set step 5 to Reset.

In addition, in Sequence 1 you can program rests by setting a step value to “Rest”, just past Reset. On that step, no trigger is sent to the envelopes. Since Sequence 1 controls rests for Sequences 2–4 as well, the rests will end up in different places on other sequences if they are a different length.

If you want all sequences to be the same length, make sure that the reset step is the same for all four sequences. If however, each sequence is a different length, the rests and clock swing settings will follow sequence 1. In other words, the envelopes are always triggered from one sequence and can't be separately handled by each of the 4 sequences.

Using rests, resets, and different Clock Divides (half swing, swing, and so on) you can generate very complex sequences.

### To program a sequence:

1. Select the sequence you want to program by pressing the appropriate switch, 1–4.
2. Select the destination for the sequence using the Destination knob. For example, to generate a sequence of notes, select OscAllFreq.

**Note:** *When a sequence is routed to oscillator frequency, each knob increment equals half of a semitone. The LCD display will show the relative note value, with a “+” after it to show when at a half-semitone step.*

3. Press the Reset switch to reset the sequence to Step 1.
4. Turn the Step 1 knob to the desired value. If the sequencer is stopped, each time you turn a Step knob, the envelopes are triggered, allowing you to hear the notes (or other modulation) generated by the step value.
5. Repeat for each subsequent step in the sequence.
6. Press the START/STOP switch to start the sequence.
7. Press the START/STOP switch again to stop the sequence.

**Note:** *Pressing the RESET switch resets the sequencer to step 1 whether or not it is running. The RESET switch also acts as an all-notes-off, and resets all controllers if pressed while the sequencer is not running.*

An alternate way to program a sequence is to use the keyboard. Hit the WRITE switch, then hit START/STOP – you are now in sequence record mode. Simply hit the keys you want to record and the sequencer will automatically increment to the next step. It will keep looping from 16 to 1 if you keep hitting notes. You can hit any of the other

sequence switches while recording to program all of the sequences in one write session. Hit START/STOP or WRITE when you are done recording.

When recording from the keyboard, you cannot reach the half semitone step values. You can program rests by just hitting any key above the highest D key, and you can program a reset by hitting high C. Note that you can program values into sequences using the keyboard even if a sequence is going to a destination other than oscillator pitch; this makes for quick programming.

In Program mode, only voice 1 plays the sequence (if one is programmed); the other 3 voices are still controlled via the keyboard. In Combo mode, each Part can have the sequencer individually enabled or disabled.

Some Trigger modes will automatically start the sequencer for gated sequence operation. In this case, all four voices in Program mode will use the sequencer, not just voice 1.

## Suggested Destinations

You can really have some fun with other destinations. For example, route a sequence to Delay amount to have the delay level change; or to feedback amount to drastically change the sound every step. FM and Ring Mod Levels are fun to sequence, too – you get the idea. With four sequences, you can program a very dynamic sequence.

**Note:** *Another very useful way to modulate a sequence is using LFOs with sync; LFO frequency runs 0–150, after which you can select the sync settings. A setting of 16 Steps for LFO Frequency with a Triangle wave selected and routed to the filter will provide a clean filter sweep over a 16 step sequence, perfectly in sync! This is much easier (and smoother) than programming a filter sweep using sequence steps.*

The sequencer can also be routed to MIDI output destinations, including Note Number, Velocity, Mod Wheel, Pressure, Breath, and Foot Controller. Velocity is a special case – it only works if selected as the destination for Sequence 2 when Sequence 1's destination routed to Note Number. The same for Sequence 3 and 4 (Sequence 4 can be velocity for Sequence 3). If velocity is not used as a destination, the velocity output is 120. So, it is possible to have up to 4 note sequences sent out over MIDI.

The actual MIDI note transmitted is the sequence step value plus one (since MIDI note on of zero = note off). Note that this is different than the half-semitone when driving the internal oscillators – this was done to provide a wider range of notes. Also, the main Transpose is added/subtracted to the MIDI note output. Velocity and the other controllers are converted from 0 – 100 range to 0 – 127 range for MIDI.

**Note:** *The MIDI output destinations only work on Voice 1; you cannot have multiple voices in Combo mode sending out to MIDI.*

Another possible sequencer destination is Clock Mod. It works via a multiplier based on a step value of 40. If a sequencer step is set to 40, the clock speed stays as set. If set to 20, (half of 40), the clock will be twice as fast for that step. Likewise, a step value of 80 will be twice as slow as normal, and 10 would be 4 times faster.

Note that overall limits of 30 to 250 BPM still apply; for example, if you have a BPM of 120, and a sequencer step of 10, it will try to go four times faster than 120, which is 480. Since it is greater than 250, it will clamp at 250. With clever choices of BPM (using Clock Divide as necessary) you can develop a pretty wide range of timing possibilities. Also, with sequences of different lengths, it can really get quite wild.



## Modulation Destinations

Display	Destination
Off	No destination selected
Osc 1 Freq	Oscillator 1 Frequency
Osc 2 Freq	Oscillator 2 Frequency
Osc 3 Freq	Oscillator 3 Frequency
Osc 4 Freq	Oscillator 4 Frequency
OscAllFreq	Oscillator All Frequency – goes to all four
Osc1 Level	Oscillator 1 Level
Osc2 Level	Oscillator 2 Level
Osc3 Level	Oscillator 3 Level
Osc4 Level	Oscillator 4 Level
OscAll Lev	Oscillator All Level
NoiseLevel	Noise Level
Ext InLevel	External In Level
Osc1 PulsW	Oscillator 1 Pulse width
Osc2 PulsW	Oscillator 2 Pulse width
Osc All PW	Oscillator All Pulse width
FM Osc4>3	Frequency Mod (FM) Amount; Osc 4 -> 3
FM Osc3>4	Frequency Mod (FM) Amount; Osc 3 -> 4
RM Osc4>3	Ring Mod (Amplitude) Amount; Osc 4 -> 3
RM Osc3>4	Ring Mod (Amplitude) Amount; Osc 3 -> 4
Low Pass	Lowpass filter frequency
LP Split	Filter Split –separation between left / right
Resonance	Resonance
High Pass	Highpass filter- will not work if Highpass is set to 0
UCA Level	VCA amount
Output Pan	Pan
FBack Freq	Feedback frequency
FBack Amt	Filter Amount
Delay1Time	Delay 1 Time
Delay2Time	Delay 2 Time
Delay3Time	Delay 3 Time
DlyAllTime	Delay All Time
Delay1 Amt	Delay 1 Amount
Delay2 Amt	Delay 2 Amount
Delay3 Amt	Delay 3 Amount
DlyAll Amt	Delay All Amount
Delay FB1	Delay Feedback 1
Delay FB2	Delay Feedback 2

LFO 1 Freq	LFO 1 Frequency
LFO 2 Freq	LFO 2 Frequency
LFO 3 Freq	LFO 3 Frequency
LFO 4 Freq	LFO 4 Frequency
LFOAllFreq	LFO All Frequency
LFO 1 Amt	LFO 1 Amount
LFO 2 Amt	LFO 2 Amount
LFO 3 Amt	LFO 3 Amount
LFO 4 Amt	LFO 4 Amount
LFOAll Amt	LFO A Amount
Env 1 Amt	Envelope 1 Amount (Level)
Env 2 Amt	Envelope 2 Amount (Level)
Env 3 Amt	Envelope 3 Amount (Level)
EnvAll Amt	Envelope All Amount (Level)
Env1Attack	Envelope 1 Attack Rate
Env2Attack	Envelope 2 Attack Rate
Env3Attack	Envelope 3 Attack Rate
EnvAll Att	Envelope All Attack Rate
Env1 Decay	Envelope 1 Decay Rate
Env2 Decay	Envelope 2 Decay Rate
Env3 Decay	Envelope 3 Decay Rate
EnvAll Dec	Envelope All Decay Rate
Env1Releas	Envelope 1 Release Rate
Env2Releas	Envelope 2 Release Rate
Env3Releas	Envelope 3 Release Rate
EnvAll Rel	Envelope All Release Rate
LeftLP Frq	Filter 1 (Left) lowpass filter cutoff frequency
RightLPFrq	Filter 2 (Right) lowpass filter cutoff frequency
LeftLP Res	Filter 1 (Left) lowpass filter resonance
RightLPRes	Filter 2 (Right) lowpass filter resonance
Distortion	Distortion - will not work if distortion is set to 0 (off) or 1 (noise gate select)

### Additional Sequencer-Only Modulation Destinations

Seq Clock	Sequencer clock (BPM) multiplier
Midi Note	MIDI note number
M Note Vel	MIDI Velocity
Midi ModWh	MIDI Mod Wheel
Midi press	MIDI Pressure
Midibreath	MIDI Breath Controller
Midi Foot	MIDI Foot Controller

## Modulation Sources

Display	Source
Off	No Source selected
Sequence1	Sequence 1
Sequence2	Sequence 2
Sequence3	Sequence 3
Sequence4	Sequence 4
LFO 1	LFO 1
LFO 2	LFO 2
LFO 3	LFO 3
LFO 4	LFO 4
FilterEnv	Filter Envelope
VCA Env	Amp (VCA) Envelope
Envelope3	Envelope 3
Ext InPeak	External Audio Input Peak
EInEnvFol	External Audio Envelope Follower
PitchBend	Pitch Bend
Mod Wheel	Mod Wheel
Pressure	Pressure (Aftertouch)
MidBreath	Midi - Breath Controller
Midi Foot	Midi - Foot Controller
Velocity	Keyboard Note Velocity
KeyNumber	Keyboard Note Number
Midi Exp	Midi – Expression
Noise	Noise
Osc 3	Oscillator 3
Osc 4	Oscillator 4

# Combo Parameters

Combos are used to make different combinations of Programs, and use them in different ways. You can use up to four different Parts, each with its own set of 16 parameters.

To edit the Combo parameters, first hit the desired COMBO PART Switch. The PARAM 1 knob now selects the parameter, and the PARAM 2 knob changes the value. The + and – switches will increment/decrement the value also. The COMBO PART switches select one of the four parts.

While playing a Combo, it is possible to edit the Program parameters of the individual Parts, or of all the Parts together. If you turn a knob with no Parts selected (meaning no Combo Part LEDs are on), the new value will go to all Parts. While this doesn't really make a lot of sense, since the Programs are often very different in each Part, it turns out to be interesting to do quite often.

Otherwise, if you select a Part first, and then turn a knob, then just that Part will be edited. This allows you to go between different parts while performing and change the sound however you wish.

**Note:** *You cannot save the individual programs in each Part while in Combo mode. Since a Program can be used in many different Combos, saving the changes will likely cause problems elsewhere.*

Below we describe the 16 parameters for each Part. The upper LCD line shows the Part number; lower lines are used for the parameter.

**Mode: see table** – Selects the polyphony of this Part. When a Combo is selected, it starts assigning voices to Parts with Part 1. You cannot assign more than 4 voices. For example, if you set both Part 1 and Part 2 to Poly 3, the total would be 6 voices, so it obviously it will not work in a four voice instrument. In this case, it would assign the first 3 voices to Part 1, and the last voice to Part 2, ignoring the rest of the Parts. Looking at the voice LED's on the front panel will help to see the voice operation.

Display	Part Mode
Off	Don't use this Part
Poly 4	Assign 4 voices to this Part
Poly 3	Assign 3 voices to this Part
Poly 2	Assign 2 voices to this Part
Mono	Assign 1 voice monophonically to this Part

**Program: 1...128** – Selects the Program to use for this Part.

**Bank: 1...3** – Selects the Bank of the Program to use for this Part.

**MIDI Mode: see table** – Selects the Program to use for this Part.

Display	MIDI mode
Off	This Part will not respond to MIDI
Notes	This Part only responds to MIDI notes
Cntrl's	This Part only responds to MIDI controller messages
On All	This Part responds to both MIDI notes and MIDI controller messages

**MIDI Ch: 1...16, All** – Selects the MIDI channel to use for this Part. If All is selected, it responds to any MIDI channel. If MIDI Mode is set to Off, this parameter is ignored.

**Sequencer: Enable, Disable** – Enables or disables the Program's sequencer for this Part. Only Parts with the Sequencer enabled will respond to hitting the START switch or MIDI Start commands (when MIDI clocks are enabled in the Global setting). If this Part uses a gated sequence Trigger mode (see below), you should leave the Sequencer Off – the voices in this Part will play the gated sequences automatically.

**Tempo: 30...250** – Sets the tempo of the Part – ignored if the Sequencer is Off.

**Clock Div: see table** – Sets the clock divider for this Part, also ignored if Sequencer is Off.

Display	Tempo	Timing Division
Half	BPM/2	Half note
Quartr	BPM	Quarter note
Eighth	BPM x 2	Eighth note
8half	BPM x 2	Eighth note, half swing timing
8swing	BPM x 2	Eighth note, full swing timing
8trip	BPM x 3	Eighth note triplets
16th	BPM x 4	Sixteenth note
16half	BPM x 4	Sixteenth note, half swing timing
16swing	BPM x 4	Sixteenth note, full swing timing
16trip	BPM x 6	Sixteenth note triplets
32nd	BPM x 8	Thirty-second note
32trip	BPM x 12	Thirty-second note triplets
64trip	BPM x 24	Sixty-fourth note triplets

**Trigger: see table** – Selects the source of triggers/gates for the envelope generators for this Part. Note that the Sequencer and/or keyboard must be enabled to match the Trigger selected.

In the Poly (different from the Evolver) some of the Trigger modes will automatically turn the Sequencer on. This allows gated-sequence Programs to be played without having to manually hit the START/STOP switch. The Trigger modes that do this are marked in the table as **AUTO**.

Display	Envelope Trigger Selections
Sequencer or Key	The envelopes will be triggered by either the sequencer or the keyboard. When triggered by the sequencer, the gates are on for half the step time. Simply adjust the envelope parameters (ADSR) for the desired effect.
Sequencer Only	The envelopes will be triggered by only the sequencer.
Keyboard Only	The envelopes will be triggered by the keyboard only.
Key, Resets Seq	The envelopes will be triggered by the keyboard, and the sequencer will be reset on every key (if it is running). The sequencer will not trigger the envelopes.
Key, Gates Seq	Gated mode – the envelopes will be triggered by the sequencer when a key is held; in other words the keyboard will gate the sequencer. <b>AUTO</b>
KeyGates Seq Rst	Gated mode, reset – same as Gated mode, except every time a key is hit, the sequencer is reset to step 1. <b>AUTO</b>
Ext Audio Input	The envelopes are gated by the Left external audio input signal level, in other words, when the signal gets above a fixed threshold, the envelopes start. The envelopes then go into the release phase when the signal level drops below a second fixed threshold.
Ext In, ResetsSeq	Same as external in, but also resets the sequencer to step 1 if it is running.
Ext In, Gates Seq	External In signal will gate the sequencer. <b>AUTO</b>
Ext In GateSeqRst	External In signal will gate the sequencer, and also resets the sequencer to step 1 on each new gate. <b>AUTO</b>
Key GatesSeqOnce	Plays a sequence once (according to the length of Sequence 1) when a key is hit. The sequence is not restarted on multiple keys until it finishes and stops. <b>AUTO</b>
Key GateSeqOnceR	Also plays a sequence once when a key is hit, but will re-start the sequence on each key hit. <b>AUTO</b>
Ext In Steps Seq	Plays one step of the sequencer on each External Input audio trigger. <b>AUTO</b>
Key Steps Seq	Plays one step of the sequencer on each key hit. <b>AUTO</b>

**Transpose: -36...+36** – Transpose control for this Part; 0 is centered, steps in semitones. Note that it is summed with the Global Transpose, and the overall limit of the two controls is -36 to +36. For example, if the Combo is transposed down two octaves (-24) and you then turn the Global transpose down two octaves, summing the two would be -48, which is out of range. In this case, it automatically adds octaves to keep it in range.

**Fine Freq: -50...+50** – Fine Tune control for this Part; 0 centered, steps in cents (50 cents = ½ semitone). As with the Transpose, it is summed with the Global Fine Freq, and the summed limit is -50 to +50.

**Volume: 0...100** – Sets the Volume level for this Part.

**Low Key: C -2...C 8** – This parameter, along with the High Key parameter following, sets the keyboard range that this part will respond to. The frequency covers a 10 octave range, from 8 Hz to 8KHz, stepping in semitones. C3 is middle C (MIDI note 60). The keyboard range is used for setting up keyboard splits, for example when Part 1 is set from C-2 to C2 with one voice (unison), and Part 2 is set from C#2 to C 8 with 3 voices (Poly 3).

Or, you may want to stack two voices, by setting two Parts to Poly 2, and setting both keyboard ranges to the same range (C-2 to C8). You can even stack four Unison Parts, each with a different Program, for a super-thick mono synth.

**High Key: C -2...C 8** – This parameter sets the high keyboard limit for this Part in conjunction with the Low Key parameter.

**Low Velocity: 0...127** – This parameter, along with the Hi Velocity parameter following, sets the velocity range this Part responds to. This is useful for setting a velocity split point, so one Part plays at low velocity notes, and another plays at higher velocities. Or, you could set multiple velocity split points.

**Hi Velocity: 0...127** – This parameter, along with the Lo Velocity parameter following, sets the velocity range this Part responds to.

# MIDI Implementation

The Poly Evolver receives MIDI data according to the mode controls in the Global Section. When in Combo mode, the Global parameters may be overridden by the Combo settings. In addition, there is interaction between some of the Program parameters that determine the overall response of Evolver to MIDI data. Following are the parameters that affect response to MIDI.

## Global Parameters

**MIDI Channel:** *ALL, 1...16* – Selects the MIDI channel to send and receive data, 1 to 16. All receives on any channel.

**Poly Chain:** *ALL, 5...20*– Use this to link multiple Evolvers and Poly Evolvers into a system with more voices by intelligently processing the keys hit and passing MIDI data through to the Poly Chain MIDI out jack where it can be routed to another Evolver or Poly Evolver. Note that MIDI clocks are handled separately per the MIDI Clock parameter.

**Local Control:** *Off, On* – Enables or disables the internal connection between the keyboard and panel controls and the synth electronics. This is useful with some sequencers.

**Clock:** *see table* – Selects the MIDI clock status, and enables External sequencer triggers, as follows:

Display	MIDI Clock Setting
Internal	MIDI clock is neither sent nor received
MIDI Out	MIDI clock is sent
MIDI In	MIDI clock is received
M In Out	MIDI clock is received and transmitted (use with Poly Chain)
In no ss	MIDI clock is received, but MIDI start/stop/continue messages are ignored.

## Combo Parameters

**MIDI Mode:** *see table* – Selects the Program to use for this Part.

Display	MIDI mode
Off	This Part will not respond to MIDI
Notes	This Part only responds to MIDI notes
Cntrl's	This Part only responds to MIDI controller messages
On All	This Part responds to both MIDI notes and MIDI controller messages



**MIDI Ch: 1...16, All** – Selects the MIDI channel to use for this Part. If All is selected, it responds to any MIDI channel. If MIDI Mode is set to Off, this parameter is ignored.

**RESET switch:** Acts as a MIDI all-notes-off, and resets all MIDI controllers when hit while the sequencer is not running.

## MIDI Messages

### Received Channel Messages

Status	Second	Third	Description
1000 nnnn	0kkkkkkk	0vvvvvvv	Note Off. Velocity is ignored
1001 nnnn	0kkkkkkk	0vvvvvvv	Note On. Note off if vvvvvvvv = 0
1010 nnnn	0kkkkkkk	0vvvvvvv	Polyphonic Key Pressure
1011 nnnn	0vvvvvvv	0vvvvvvv	Control Change; see “Received Controller Messages” table following
1100 nnnn	0pppppppp		Program change, 0 – 127 for Programs 1 – 128 within current Bank
1101 nnnn	0vvvvvvv		Channel Pressure
1110 nnnn	0vvvvvvv	0vvvvvvv	Pitch Bend LS Byte then MS Byte

Notes: 0kkkkkkk      Note number 0 - 127  
 nnnn                  Channel number 0 to 15 (MIDI channel 1-16). Ignored if MIDI  
                              channel set to ALL  
 0vvvvvvv            Value

### Received Controller Messages

Status	Second	Third	Description
1011 nnnn	0000 0001	0vvvvvvv	Mod Wheel – directly assignable controller
1011 nnnn	0000 0010	0vvvvvvv	Breath Controller – directly assignable controller
1011 nnnn	0000 0100	0vvvvvvv	Foot Controller – directly assignable controller
1011 nnnn	0000 0111	0vvvvvvv	Volume – Combined with Master Volume and Program Volume
1011 nnnn	0100 1010	0vvvvvvv	Brightness – Added to lowpass filter cutoff frequency
1011 nnnn	0000 1101	0vvvvvvv	Expression Controller – directly assignable controller
1011 nnnn	0010 0000	0vvvvvvv	Bank Select – 0 to 3 selects banks 1 to 4; others ignored
1011 nnnn	0100 0000	0vvvvvvv	Damper pedal – holds envelopes in Sustain if 0100 0000 or higher
1011 nnnn	0111 1101	0vvvvvvv	All Notes Off – clear all MIDI notes
1011 nnnn	0111 1011	0vvvvvvv	Reset All Controllers – clears all MIDI controllers to 0, MIDI volume to maximum

### System Common Messages

Status	Second	Third	Description
1111 0010	0vvvvvvv	0vvvvvvv	Song Position Pointer – LS Byte then MS Byte. Positions depends on Clock Divide. For example, if Clock Divide is set to 4n (quarter note), then the sequence is 4 measures of 4/4 in length. The Song Position will calculate correctly within the four bars.

### System Real-time Messages

Status	Description
1111 1000	Timing Clock
1111 1010	Start – starts the sequencer from step 1
1111 1011	Continue – re-starts the sequencer from the current step
1111 1100	Stop – Stops the sequencer

### Universal System Exclusive Message (Device Inquiry)

Status	Description
1111 0000	System Exclusive (SysEx)
0111 1110	Non-realtime message
0vvv vvvv	If MIDI channel is set to 1-16, 0vvvvvvv must match (unless MIDI Channel = ALL); always responds if 0vvvvvvv = 0111 1111.
0000 0110	Inquiry Message
0000 0001	Inquiry Request
1111 0111	End of Exclusive (EOX)

Evolver responds with:

Status	Description
1111 0000	System Exclusive (SysEx)
0111 1110	Non-realtime message
0vvv vvvv	If MIDI Channel = ALL, 0vvvvvvv = 0111 1111. Otherwise 0vvvvvvv = Channel Number 0-15.
0000 0110	Inquiry Message
0000 0010	Inquiry Reply
0000 0001	DSI ID
0010 0001	Poly Evolver ID (Family LS)
0000 0000	Family MS
0000 0000	Family Member LS
0000 0000	Family Member MS
0jjj nnnn	Main PIC Software version: jjj – Major rev; nnnn – Minor Rev
0jjj nnnn	Voice PIC Software version: jjj – Major rev; nnnn – Minor Rev
0vvv vvvv	DSP Software version LS
0vvv vvvv	DSP MS
1111 0111	End of Exclusive (EOX)



## System Exclusive Messages

Note that all the System Exclusive messages use the Evolver ID, rather than the Poly Evolver ID. This maintains compatibility with Evolver, since the Programs are the same.

### Program Parameters

If this message is received while in Combo mode, only the Parts with MIDI enabled will respond to the change.

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0000	Evolver ID
0000 0001	File Version
0000 0001	Program Parameter
0vvv vvvv	Parameter Number 0 – 127. Parameters are in the same order as Evolver. The Parameter data starts on page 66.
0000 vvvv	Parameter value, LS Nibble
0000 vvvv	Parameter value, MS Nibble
1111 0111	End of Exclusive (EOX)

### Sequencer Parameters

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0000	Evolver ID
0000 0001	File Version
0000 1000	Sequence Parameter
00vv vvvv	Sequence step 0 – 63. 0 – 15 are sequence 1 steps, 16- 31 for sequence 2, etc.
0000 vvvv	Step value, LS Nibble
0000 vvvv	Step value, MS Nibble
1111 0111	End of Exclusive (EOX)

## Combo Parameters

This message is ignored if the synth is in Program mode

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0000	Evolver ID
0000 0001	File Version
0010 1010	Combo Parameter
00vv vvvv	Combo Parameter number 0 – 79. See table on page 64.
0000 vvvv	Parameter value, LS Nibble
0000 vvvv	Parameter value, MS Nibble
1111 0111	End of Exclusive (EOX)

## Global Parameters

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0000	Evolver ID
0000 0001	File Version
0000 1001	Global Parameter
0000 vvvv	Global Parameter Number 0 – 17. Global Parameters are listed starting on page 62. Note that some parameter numbers are not used; this is to maintain compatibility with Evolvers.
0000 vvvv	Parameter value, LS Nibble
0000 vvvv	Parameter value, MS Nibble
1111 0111	End of Exclusive (EOX)

### Request Program Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0000	Evolver ID
0000 0001	File Version
0000 0101	Request Program Transmit
0000 00vv	Bank Number, 0 - 3
0vvv vvvv	Program Number, 0 - 127
1111 0111	End of Exclusive (EOX)

The Poly Evolver will respond by sending out the Program Data in the format described in the Program Data Dump on page 57. It also sends a Program Name Dump message (also on page 57) after the Program dump. This makes it a complete Program dump while maintaining compatibility with Evolvers.

### Request Program Edit Buffer Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0000	Evolver ID
0000 0001	File Version
0000 0110	Request Program Edit Buffer Transmit
1111 0111	End of Exclusive (EOX)

Evolver will respond by sending out the current Program edit buffer in the format described in the Edit Buffer Dump on page 58

### Request Waveshape Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0000	Evolver ID
0000 0001	File Version
0000 1011	Request Waveshape Transmit
0vvv vvvv	Waveshape number, 0 - 127
1111 0111	End of Exclusive (EOX)

Evolver will respond by sending out the requested Waveshape data, in the format described in the Waveshape Data Dump on page 58.

### Request Combo Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0000	Evolver ID
0000 0001	File Version
0010 0001	Request Combo Transmit
0000 00vv	Bank Number, 0 - 2
0vvv vvvv	Program Number, 0 - 127
1111 0111	End of Exclusive (EOX)

Evolver will respond by sending out the Combo Data in the format described in the Combo Data Dump on page 57.

### Request Combo Edit Buffer Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0000	Evolver ID
0000 0001	File Version
0011 1000	Request Combo Edit Buffer Transmit
1111 0111	End of Exclusive (EOX)

Evolver will respond by sending out the current edit buffer in the format described in the Combo Edit Buffer Dump on page 58

### Request Global Parameter Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0000	Evolver ID
0000 0001	File Version
0000 1110	Request Global Parameter Transmit
1111 0111	End of Exclusive (EOX)

Evolver will respond by sending out the current edit buffer in the format described in the Global Parameter Dump on page 57



### Program Data Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0000	Evolver ID
0000 0001	File Version
0000 0010	Program Data
0000 00vv	Bank Number, 0 - 3
0vvv vvvv	Program Number, 0 - 127
0vvv vvvv	220 bytes in "packed MS bit" format (see page 60). Includes 128 bytes of Program parameters and 64 bytes of Sequence data.
1111 0111	End of Exclusive (EOX)

### Program Name Data Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0000	Evolver ID
0000 0001	File Version
0001 0001	Program Name Data
0000 00vv	Bank Number, 0 - 3
0vvv vvvv	Program Number, 0 - 127
0vvv vvvv	16 name data bytes. Note that the Poly Evolver stores the basic 7 bit data. The assumption is that the data is ASCII
1111 0111	End of Exclusive (EOX)

### Combo Data Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0000	Evolver ID
0000 0001	File Version
0010 0010	Combo Data
0000 00vv	Bank Number, 0 - 2
0vvv vvvv	Combo Number, 0 - 127
0vvv vvvv	92 bytes in "packed MS bit" format (see page 60) = 80 bytes of Combo data
1111 0111	End of Exclusive (EOX)

### Program Edit Buffer Data Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0000	Evolver ID
0000 0001	File Version
0000 0011	Edit Buffer Data
0vvv vvvv	220 bytes in "packed MS bit" format (see page 60). Includes 128 bytes of Program parameters and 64 bytes of Sequence data.
1111 0111	End of Exclusive (EOX)

### Combo Edit Buffer Data Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0000	Evolver ID
0000 0001	File Version
0011 0111	Edit Buffer Data
0vvv vvvv	220 bytes in "packed MS bit" format (see page 60). Includes 128 bytes of Program parameters and 64 bytes of Sequence data.
1111 0111	End of Exclusive (EOX)

### Global Parameters Data Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0000	Evolver ID
0000 0001	File Version
0000 1111	Main Parameter Data
0vvv vvvv	34 nibbles (LS then MS) for 17 Global parameters. Global Parameters are listed starting on page 62.
1111 0111	End of Exclusive (EOX)

## Waveshape Data Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0000	Evolver ID
0000 0001	File Version
0000 1010	Waveshape Data
0vvv vvvv	Waveshape number, 0 – 127, corresponds to Waveshapes 1 – 128. Only Waveshapes 96 – 127 can be sent to Evolver and saved as user programmable; others will be ignored.
0vvv vvvv	293 bytes in “packed MS bit” format (see page 60). The 293 bytes = 256 data bytes, in the format of LS byte/MS byte, for the 128 16-bit words that make up a waveshape. The ROM Waveshapes are 12 bit two’s complement (to match the VS), but the User Waveshapes (97 – 128) can be a full 16 bits.
1111 0111	End of Exclusive (EOX)

# Packed Data Format

Data is packed in 8 byte “packets”, with the MS bit stripped from 7 parameter bytes, and packed into an eighth byte, which is sent at the start of the 8 byte packet.

Example:

## Input Data

```
1 A7 A6 A5 A4 A3 A2 A1 A0
2 B7 B6 B5 B4 B3 B2 B1 B0
3 C7 C6 C5 C4 C3 C2 C1 C0
4 D7 D6 D5 D4 D3 D2 D1 D0
5 E7 E6 E5 E4 E3 E2 E1 E0
6 F7 E6 E5 E4 E3 E2 E1 E0
7 G7 G6 G5 G4 G3 G2 G1 G0
```

## Packed MIDI data

```
1 00 G7 F7 E7 D7 C7 B7 A7
2 00 A6 A5 A4 A3 A2 A1 A0
3 00 B6 B5 B4 B3 B2 B1 B0
4 00 C6 C5 C4 C3 C2 C1 C0
5 00 D6 D5 D4 D3 D2 D1 D0
6 00 E6 E5 E4 E3 E2 E1 E0
7 00 E6 E5 E4 E3 E2 E1 E0
8 00 G6 G5 G4 G3 G2 G1 G0
```

This is why it takes 220 MIDI bytes to transmit 192 Program/Sequence data bytes, and 293 bytes to send 256 Waveshape bytes.

### Reset Switch

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0000	Evolver ID
0000 0001	File Version
0000 0100	Reset Switch
1111 0111	End of Exclusive (EOX)

Only sent when Poly Chain is on and MIDI clock is set to Out

### Select Program Mode

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0000	Evolver ID
0000 0001	File Version
0011 0000	Select Program Mode
1111 0111	End of Exclusive (EOX)

### Select Combo Mode

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0000	Evolver ID
0000 0001	File Version
0011 0001	Select Combo Mode
1111 0111	End of Exclusive (EOX)

## Global Parameter Data

Parameter	Range	Description
0	0 - 127	Program Number 1 - 128
1	0 - 3	Bank Number 1 - 4
2	0 - 100	Master Volume 0 - 100
3	0 - 72	Master Transpose; 0 = -36 semitones (- 3 octaves), 36 = 0 (no transpose), and 72 = +36 semitones.
4	30 - 250	BPM
5	0 - 12	Clock Divide: 0 Half Note 1 Quarter Note 2 Eighth Note 3 Eighth Note half swing 4 Eighth Note full swing 5 Eighth Note triplets 6 Sixteenth Note 7 Sixteenth Note half swing 8 Sixteenth Note full swing 9 Sixteenth Note triplets 10 Thirty-second Notes 11 Thirty-second Notes triplets 12 Sixty-Fourth Notes triplets
6	0 - 1	Use Program tempo; 0 = Off, 1 = On
7	0 - 6	MIDI clock select 0 Use Internal clock, don't send MIDI clock 1 Use Internal clock, send MIDI clock 2 Use MIDI clock In 3 Use MIDI clock In, and retransmit MIDI clock out 4 No change 5 No change 6 Use MIDI clock In, but ignore MIDI Start/Stop
8	x	Not used (zero sent in Main Dump)
9	0 - 16	Poly Chain 0 No Chaining 1 5 voices total 2 6 voices total . 16 20 voices total
10	0 - 8	Input Gain 0 No gain 1 + 3 db 2 + 6 db 3 + 9 db 4 + 12 db 5 + 15 db 6 + 18 db 7 + 21 db 8 + 24 db
11	0 - 100	Master Fine Tune; 0 = -50 cents, 50 = 0 (centered), 100 = + 50 cents

12	x	Not used (zero sent in Main Dump)
13	x	Not used (zero sent in Main Dump)
14	0 - 16	MIDI Channel; if = 0, data received on all MIDI channels. Otherwise = channel number 1 – 16.
15	X	Not used (zero sent in Main Dump)
16	0 – 127	Combo number 1 - 128
17	0 – 2	Combo Bank 1 to 3
18	0 - 1	MIDI Program Change enable
19	0 - 1	MIDI Pressure enable
20	0 - 1	MIDI Controller enable
21	0 - 1	MIDI SysEx enable
22	0 - 5	Pedal/CV 1 destination
23	0 - 5	Pedal/CV 2 destination
24	0 - 3	Velocity Curve
25	0 - 3	Pressure Curve
26	0 - 1	Local Control Off/On
27	0 - 1	Damper Polarity; 0 = normally open, 1 = normally closed

Note: Some parameters are not used in order to maintain the closest match with standard Evolvers.

## Combo Parameter Data

There are 4 identical parts in a Combo; they are listed below. The name of the combo follows the other parameters.

1	2	3	4	Range	Description
0	16	32	48	0 - 4	Mode – number of polyphonic voices 0 Off 1 Poly 4 2 Poly 3 3 Poly 2 4 Unison
1	17	33	49	0 - 127	Program
2	18	34	50	0 - 3	Bank
3	19	35	51	0 - 3	MIDI Mode 0 Off 1 Notes only 2 Controller messages only 3 All – notes and controllers
4	20	36	52	0 - 16	MIDI Channel; if = 0, data received on all MIDI channels. Otherwise = channel number 1 – 16.
5	21	37	53	0 - 1	Sequencer; 0 = Off, 1 = On
6	22	38	54	30 - 250	Tempo
7	23	39	55	0 - 12	Clock Divide: 0 Half Note 1 Quarter Note 3 Eighth Note 4 Eighth Note half swing 5 Eighth Note full swing 6 Eighth Note triplets 7 Sixteenth Note 8 Sixteenth Note half swing 9 Sixteenth Note full swing 10 Sixteenth Note triplets 11 Thirty-second Notes 12 Thirty-second Notes triplets 12 Sixty-Fourth Notes triplets
8	24	40	56	0 - 13	Trigger Select 0 All - The envelopes will be triggered by either the sequencer or keyboard 1 Seq – The envelopes will be triggered by the sequencer only. 2 Keyboard - The envelopes will be triggered by the keyboard only. 3 Keyboard Reset– Same, with sequencer reset on Note On 4 Combo - Envelopes will only be triggered with both a keyboard note and the sequencer running 5 Combo Reset – same, with sequencer reset on Note On 6 External Input gates the envelopes 7 External Input gates the envelopes and resets the sequencer 8 External Input gates the sequencer



					9 External Input gates the sequencer and resets the sequencer
					10 Keyboard plays sequence once
					11 Keyboard plays sequence once, resetting on multiple notes
					12 External Trigger – the sequence plays once on an external signal
					13 Keyboard trigger – the sequence plays once when a key is hit
9	25	41	57	0 - 72	Transpose; 0 = -36 semitones (- 3 octaves), 36 = 0 (no transpose), and 72 = +36 semitones.
10	26	42	58	0 - 100	Fine Freq; 0 = -50 cents, 50 = 0 (centered), 100 = +50 cents
11	27	43	59	0 - 100	Volume level for this part
12	28	44	60	0 - 127	Low Key
13	29	45	61	0 - 127	High Key
14	30	46	64	0 - 127	Low Velocity
15	31	47	63	0 - 127	High Velocity

Parameters		
64 - 79	32 - 127	Name characters 1 - 16

## Program Parameter Data

Parameter	Range	Description
0	0 - 120	Oscillator 1 Frequency, 0 – 120 in semitones (10 octave range)
1	0 - 100	Oscillator 1 Fine Tune; 0 = -50 cents, 50 = 0 (centered), 100 = + 50 cents
2	0 - 102	Oscillator 1 Shape 0 Sawtooth 1 Triangle 2 Sawtooth/triangle mix 3 – 102 Pulse Wave, Pulse width 0 - 99
3	0 - 100	Oscillator 1 Level
4	0 - 120	Oscillator 2 Frequency, 0 – 120 in semitones (10 octave range)
5	0 - 100	Oscillator 2 Fine Tune; 0 = -50 cents, 50 = 0 (centered), 100 = + 50 cents
6	0 - 102	Oscillator 2 Shape 0 Sawtooth 1 Triangle 2 Sawtooth/triangle mix 3 – 102 Pulse Wave, Pulse width 0 - 99
7	0 - 100	Oscillator 2 Level

Parameter	Range	Description
8	0 - 120	Oscillator 3 Frequency, 0 – 120 in semitones (10 octave range)
9	0 - 100	Oscillator 3 Fine Tune; 0 = -50 cents, 50 = 0 (centered), 100 = + 50 cents
10	0 - 127	Oscillator 3 Shape 1 - 128
11	0 - 100	Oscillator 3 Level
12	0 - 120	Oscillator 4 Frequency, 0 – 120 in semitones (10 octave range)
13	0 - 100	Oscillator 4 Fine Tune; 0 = -50 cents, 50 = 0 (centered), 100 = + 50 cents
14	0 - 127	Oscillator 4 Shape 1 - 128
15	0 - 100	Oscillator 4 Level

Parameter	Range	Description
16	0 - 164	Filter Frequency, steps in semitones
17	0 - 198	Filter Envelope Amount; -99 to +99
18	0 - 110	Filter Envelope Attack
19	0 - 110	Filter Envelope Decay
20	0 - 100	Filter Envelope Sustain
21	0 - 110	Filter Envelope Release
22	0 - 100	Resonance
23	0 - 100	Filter Keyboard Amount

Parameter	Range	Description
24	0 - 100	VCA Level
25	0 - 100	VCA Envelope Amount
26	0 - 110	VCA Envelope Attack
27	0 - 110	VCA Envelope Decay
28	0 - 100	VCA Envelope Sustain
29	0 - 110	VCA Envelope Release
30	0 - 6	Output Pan 0 Left channel panned fully left, Right fully to the right 1 Left channel panned mostly left, Right mostly to the right 2 Left channel panned somewhat left, Right somewhat to the right 3 Mono 4 Right channel panned somewhat left, Left somewhat to the right 5 Right channel panned mostly left, Left mostly to the right 6 Right channel panned fully left, Left fully to the right
31	0 - 100	Program Volume

Parameter	Range	Description
32	0 - 48	Feedback Frequency – steps in semitones
33	0 - 100	Feedback Amount
34	0 - 1	Grunge; 0 = off, 1 = on
35	0 - 166	Delay 1 Time
36	0 - 100	Delay 1 Level
37	0 - 100	Delay sum feedback to Delay input
38	0 - 100	Delay sum feedback to filter input
39	0 - 14	Output hack amount

Parameter	Range	Description
40	0 - 160	LFO 1 Frequency; 0 – 150 unsynced frequency 151 Sequence speed divided by 32 152 Sequence speed divided by 16 153 Sequence speed divided by 8 154 Sequence speed divided by 4 155 Sequence speed divided by 2 156 One cycle per step 157 Two cycles per step 158 Four cycles per step 159 Eight cycles per step 160 Sixteen cycles per step
41	0 - 4	LFO 1 Shape 0 Triangle 1 Reverse Sawtooth 2 Sawtooth 3 Pulse (square) 4 Random

42	0 - 100	LFO 1 Amount
43	0 - 68	LFO 1 Destination (see destination table on page 72)
44	0 - 160	LFO 2 Frequency (same as LFO 1)
45	0 - 4	LFO 2 Shape (same as LFO 1)
46	0 - 100	LFO 2 Amount
47	0 - 68	LFO 2 Destination (see destination table on page 72)

Parameter	Range	Description
48	0 - 198	Envelope 3 Amount; -99 to +99
49	0 - 68	Envelope 3 Destination (see destination table on page 72)
50	0 - 110	Envelope 3 Envelope Attack
51	0 - 110	Envelope 3 Envelope Decay
52	0 - 100	Envelope 3 Envelope Sustain
53	0 - 110	Envelope 3 Envelope Release
54	0 - 13	Trigger Select 0 All - The envelopes will be triggered by either the sequencer or the keyboard 1 Seq – The envelopes will be triggered by the sequencer only. 2 The envelopes will be triggered by the keyboard only. 3 Same, with sequencer reset on Note On 4 Combo - Envelopes will only be triggered by both the keyboard and the sequencer is running 5 Combo Reset – same, with sequencer reset on Note On 6 External Input gates the envelopes 7 External Input gates the envelopes and resets the sequencer 8 External Input gates the sequencer 9 External Input gates the sequencer and resets the sequencer 10 Keyboard plays sequence once 11 Keyboard plays sequence once, resetting on multiple notes 12 External Trigger – the sequence plays once on an external signal 13 The sequence plays once when a key is hit
55	0 - 73	Key Off / Transpose – 0 = Key pitch ignored. 1 = -36 semitones keyboard transpose, 37 = no transposing, 73 = +36 semitones

Parameter	Range	Description
56	0 - 75	Sequencer 1 Destination (see destination table on page 72)
57	0 - 75	Sequencer 2 Destination (see destination table on page 72)
58	0 - 75	Sequencer 3 Destination (see destination table on page 72)
59	0 - 75	Sequencer 4 Destination (see destination table on page 72)
60	0 - 100	Noise Volume
61	0 - 100	External Input Volume
62	0 - 2	External Input Mode 0 Stereo 1 Left Input channel goes to both channels 2 Right Input channel goes to both channels

		3 Left channel audio, Right channel control
63	0 - 14	Input Hack Amount

Parameter	Range	Description
64	0 - 200	Glide, Oscillator 1; 101 – 199 = Fingered; 200 = osc midi off
65	0 - 1	Sync; 0 = off, 1 = on
66	30 - 250	Program tempo
67	0 - 12	Program Clock Divide (see Master Clock Divide for selections)
68	0 - 200	Glide, Oscillator 2; 101 – 199 = Fingered; 200 = osc midi off
69	0 - 5	Oscillator Slop
70	0 - 12	Pitch Bend Range, in semitones
71	0 - 23	Key Mode 0 Low note priority 1 Low note priority with re-trigger 2 High note priority 3 High note priority with re-trigger 4 Last note hit priority 5 Last note hit priority with re-trigger  Add 0 for Poly, 6 for Mono, 12 for Unison 1, and 18 for Unison 2 to the above

Parameter	Range	Description
72	0 - 200	Glide, Oscillator 3; 101 – 199 = Fingered; 200 = osc midi off
73	0 - 100	FM, Oscillator 4 to Oscillator 3
74	0 - 4	Shape Mod Oscillator 3; 0 = Off, 1 = Sequence 1, etc.
75	0 - 100	Ring Mod, Oscillator 4 to Oscillator 3
76	0 - 200	Glide, Oscillator 4; 101 – 199 = Fingered; 200 = osc midi off
77	0 - 100	FM, Oscillator 3 to Oscillator 4
78	0 - 4	Shape Mod Oscillator 4; 0 = Off, 1 = Sequence 1, etc
79	0 - 100	Ring Mod, Oscillator 3 to Oscillator 4

Parameter	Range	Description
80	0 - 1	2/4 Pole Select; 0 = 2 Pole, 1 = 4 Pole
81	0 - 100	Filter Envelope Velocity
82	0 - 100	Filter Audio Modulation
83	0 - 100	Filter Split
84	0 – 199	Highpass Filter cutoff. 0-99 for filter on output; 100 – 199 for levels 0-99 with filter on input
85	0 - 24	Modulation 1 Source (see Source Table on page 74)
86	0 - 198	Modulation 1 Amount; -99 to +99
87	0 - 68	Modulation 1 Destination (see destination table on page 72)

Parameter	Range	Description
88	0 - 1	Linear/Exponential envelopes 0 = Exponential, 1 = Linear
89	0 - 100	VCA Envelope Velocity
90	0 - 24	Modulation 2 Source (see Source Table on page 74)
91	0 - 198	Modulation 2 Amount; -99 to +99
92	0 - 68	Modulation 2 Destination (see destination table on page 72)
93	0 - 24	Modulation 3 Source (see Source Table on page 74)
94	0 - 198	Modulation 3 Amount; -99 to +99
95	0 - 68	Modulation 3 Destination (see destination table on page 72)

Parameter	Range	Description
96	0 - 24	Modulation 4 Source (see Source Table on page 74)
97	0 - 198	Modulation 4 Amount; -99 to +99
98	0 - 68	Modulation 4 Destination (see destination table on page 72)
99	0 - 166	Delay 2 Time
100	0 - 100	Delay 2 Level
101	0 - 166	Delay 3 Time
102	0 - 100	Delay 3 Level
103	0 - 199	Distortion; 0-99 for distortion on output; 100 – 199 for levels 0-99 with distortion on input

Parameter	Range	Description
104	0 - 160	LFO 3 Frequency (same as LFO 1)
105	0 - 4	LFO 3 Shape (same as LFO 1)
106	0 - 100	LFO 3 Amount
107	0 - 68	LFO 3 Destination (see destination table on page 72)
108	0 - 160	LFO 4 Frequency (same as LFO 1)
109	0 - 4	LFO 4 Shape (same as LFO 1)
110	0 - 100	LFO 4 Amount
111	0 - 68	LFO 4 Destination (see destination table on page 72)

Parameter	Range	Description
112	0 - 100	Envelope 3 Delay
113	0 - 100	Envelope 3 Velocity
114	0 - 198	External Input Peak Amount; -99 to +99
115	0 - 68	External Input Peak Destination (see destination table on page 72)
116	0 - 198	External Input Envelope Follower Amount; -99 to +99
117	0 - 68	External Input Envelope Follower Destination (see destination table on page 72)
118	0 - 198	Velocity Amount; -99 to +99
119	0 - 68	Velocity Destination (see destination table on page 72)

<b>Parameter</b>	<b>Range</b>	<b>Description</b>
120	0 - 198	Mod Wheel Amount; -99 to +99
121	0 - 68	Mod Wheel Destination (see destination table on page 72)
122	0 - 198	Pressure Amount; -99 to +99
123	0 - 68	Pressure Destination (see destination table on page 72)
124	0 - 198	Breath Controller Amount; -99 to +99
125	0 - 68	Breath Controller Destination (see destination table on page 72)
126	0 - 198	Foot Controller Amount; -99 to +99
127	0 - 68	Foot Controller Destination (see destination table on page 72)

## Modulation Destinations

0	No destination selected
1	Oscillator 1 Frequency
2	Oscillator 2 Frequency
3	Oscillator 3 Frequency
4	Oscillator 4 Frequency
5	Oscillator All Frequency – goes to all four
6	Oscillator 1 Level
7	Oscillator 2 Level
8	Oscillator 3 Level
9	Oscillator 4 Level
10	Oscillator All Level
11	Noise Level
12	External In Level
13	Oscillator 1 Pulse width
14	Oscillator 2 Pulse width
15	Oscillator All Pulse width
16	Frequency Mod (FM) Amount; Osc 4 -> 3
17	Frequency Mod (FM) Amount; Osc 3 -> 4
18	Ring Mod (Amplitude) Amount; Osc 4 -> 3
19	Ring Mod (Amplitude) Amount; Osc 3 -> 4
20	Filter frequency
21	Filter Split –separation between left / right
22	Resonance
23	Highpass Frequency
24	VCA amount
25	Pan
26	Feedback frequency
27	Feedback Amount
28	Delay Time 1
29	Delay Time 2
30	Delay Time 3
31	Delay Time All
32	Delay Amount 1
33	Delay Amount 2
34	Delay Amount 3
35	Delay Amount All
36	Delay Feedback 1
37	Delay Feedback 2
38	LFO 1 Frequency
39	LFO 2 Frequency
40	LFO 3 Frequency
41	LFO 4 Frequency
42	LFO All Frequency
43	LFO 1 Amount
44	LFO 2 Amount



45	LFO 3 Amount
46	LFO 4 Amount
47	LFO A Amount
48	Envelope 1 Amount
49	Envelope 2 Amount
50	Envelope 3 Amount
51	Envelope A Amount
52	Envelope 1 Attack
53	Envelope 2 Attack
54	Envelope 3 Attack
55	Envelope A Attack
56	Envelope 1 Decay
57	Envelope 2 Decay
58	Envelope 3 Decay
59	Envelope A Decay
60	Envelope 1 Release
61	Envelope 2 Release
62	Envelope 3 Release
63	Envelope A Release
64	Filter 1 (left) Cutoff Frequency
65	Filter 2 (right) Cutoff Frequency
66	Filter 1 (left) Resonance
67	Filter 2 (right) Resonance
68	Distortion

## Sequencer only destinations

69	Tempo Clock multiplier
70	MIDI Note Out
71	MIDI Velocity Out
72	MIDI Mod Wheel Out
73	MIDI Pressure Out
74	MIDI Breath Controller Out
75	MIDI Foot Controller Out

## Modulation Sources

0	No Source selected
1	Sequence 1
2	Sequence 2
3	Sequence 3
4	Sequence 4
5	LFO 1
6	LFO 2
7	LFO 3
8	LFO 4
9	Filter Envelope
10	Amp (VCA) Envelope
11	Envelope 3
12	External Audio Input Peak
13	External Audio Envelope Follower
14	Pitch Bend
15	Mod Wheel
16	Pressure
17	Midi - Breath Controller
18	Midi - Foot Controller
19	Key Velocity
20	Key Note Number
21	Midi – Expression
22	Noise
23	Oscillator 3
24	Oscillator 4



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