

Poly Evolver Operation Manual



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I N S T R U M E N T S

Poly Evolver Operation Manual

Version 2.2
February, 2010

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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, email support@davesmithinstruments.com

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Welcome...

Thanks for purchasing your Poly Evolver! 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 and register.

Editor – Register at <http://www.soundtower.com/poly/regist.htm> to get your registration code.

Version 2.0 Notes

Your Poly has the latest 2.0 features installed. Older Polys can be updated – check on our website for more information.

These features were added in such a way to have no effect on programs made on earlier units for backwards compatibility. This means that in some cases parameters may not be in a logical order, or additional functions were added by increasing values at the end of their range.

Quick Start

Here's the standard short manual to get started:

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 Poly's signal outputs to your mixer/sound system, and connect a MIDI keyboard to the MIDI in jack.

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.

Program mode is usually meant to be played from a keyboard, but you have the option of hitting the **START** button, and voice 1 will play back the sequence for that Program. You can then play along with the other 3 voices. Note that all Programs do not necessarily have sequences programmed.

Be sure to try keyboard pressure (after-touch) and mod wheel. Many of the sounds will sound fairly simple at first, and then will come alive with the controllers. Or, sometimes the notes need to be held for a while to let the sound unfold. Playing in different ways will have a big effect on the Programs.

The upper knob changes the Program number, and the lower knob changes the Bank. If you want to edit a Program, just hit the **EDIT** button. Now, the upper knob selects parameters (128 of them), and the lower knob changes the value. The **PAGE UP** and **PAGE DOWN** buttons jump through groups of parameters in logical jumps, i.e. Oscillator 1 to Oscillator 2, etc.

To select Combo mode, just hit the COMBO button. 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, etc.

There are 3 banks of 128 Combos, a total of 384. As with the Programs, you can edit Combos by just hitting the EDIT button. Again, the top knob selects the parameter, the lower changes the value of that parameter. You can have up to 4 Parts to 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 PAGE UP and PAGE DOWN buttons step between 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 things to the signal, such as filtering, envelope following, distortion, feedback, delay, driving a sequence, etc.

Hit the GLOBAL button to change higher level parameters, such as MIDI channel number, Transpose/Detune, etc. These are remembered when the synth is turned off.

Poly Evolver Editor

The Poly Evolver comes with a stand-alone editor for both the PC and the Mac OSX. Place the CDROM in your CD drive to install it. You might want to check <http://www.soundtower.com/evolver/> for the latest version. Register at <http://www.soundtower.com/poly/regist.htm> to get your registration code.

Summary

You should be up and running now; for more operation information, read on. Or, just look up specific parameters for detailed notes. Pages 34 through 36 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, etc.

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

Program Notes

There are 512 Programs and 384 Combos in your Poly Evolver. The factory sound set is on the website if you ever need to refresh it. There are additional banks of Programs on our website 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. There are some test Programs at the end of Bank 4 that you might want to erase. Also, Program 128 in bank 2 is a simple basic Program that can be used 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. Using the editor makes it easier to track Program use in Combos.

Special thanks to Program contributors, including:

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

FAQs

The Poly 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 hints:

- 1) **How do I save a Program or Combo?** Hit the WRITE button. Then hit the YES button (also known as the PAGE UP button) when prompted. All other switches are locked out in the meanwhile, though you can hit the NO button 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 use COMPARE to check the sounds in the Program destinations.
- 2) **When I change Programs, the Sequencer speed always stays the same.** Check the Global Use Program Tempo parameter – if it is Off, then the speed is not updated when Programs change. Set it to On.
- 3) **I can't get the filter to oscillate.** Check the 2 pole/4 pole switch (Row 3, Knob 1, Shift) – the filter only oscillates when 4 poles are used.
- 4) **I seem to be getting some distortion in my output.** Assuming that the Distortion is 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, you should have the levels lower, in the 40 – 60 range. Likewise, if using all three delay taps, lower the levels of each.
- 5) **I can't hear the External input.** In addition to turning up the Ext In Volume, the filter and VCA must be open to hear the signal. You can initially turn up the filter cutoff 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 modulations sources to control the VCA and Filter when using external inputs.

Using an Evolver with a Poly Evolver

The Poly Evolver has 4 voices that are identical to the single voice in an Evolver. The Poly is also in a 1U rack, which means that it can be slow to program at times. Fortunately, it is set up so you can use an Evolver with a Poly to have a five voice synth, plus you can use your Evolver as a controller for both synths!

First, connect your MIDI keyboard to the MIDI In on Evolver. Connect MIDI Out on Evolver to the MIDI In on your Poly. Next, connect the Stereo Outputs on the Evolver to the stereo Mix Inputs on the Poly. Finally, the Output of the Poly is connected to your mixer/sound system.

On Evolver, set MIDI Rec and Xmit to ALL, and Poly Chain to ALL. If you want to use an external MIDI clock, set the MIDI Clock to I-O (in-out), otherwise set it to Out. Set the MIDI channel to All or 1-16, whichever is desired.

On the Poly, just set the MIDI channel to match the Evolver, and set the MIDI clock to In. You should be all set to play! Note this setup works best in Program mode on the Poly, where all five voices are set to the same sound. You can now change Programs/Banks from the Evolver, change the Volume, or go into the Program and edit any of the parameters – for example, if you go to the Filter Frequency on Evolver and turn the knob, all five voices respond together.

Note: Remember that if you change a Main parameter on the Evolver, the Poly will change also. For example, changing MIDI channels on the Evolver will also change the MIDI channels on the Poly, which is likely what you would want. However, if you change the MIDI Clock on the Evolver, it may not be what you wanted on the Poly. Usually it all works out, but just be aware of what is happening.

When in Combo mode, the chaining does not work as well, since the first note is always played by the Evolver, and it does not know the configuration of the Combo. So, when using an Evolver with a Poly, it's best to stay in Program mode when playing from a keyboard.

Multiple Polys

You can also chain multiple Poly Evolvers in the same manner. With two Polys, set the main parameter Poly Chain of the first Poly to 8, and the second Poly Chain to Off. With 3 Polys, the first is set to 12, the second is set to 8, and the third is Off. All other settings will be the same.

With multiple Polys, you will be able to use Combo mode in a logical manner most of the time. For example, if you have a Combo with 2 programs stacked, it will play them as a 4 voice with two Polys.

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, etc), 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.

Inside the Poly Voice

Before going through the individual parameters, following is a brief description of the Poly's architecture of a single Poly 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, etc).

Analog-to-Digital (A/D) and Digital-to-Analog (D/A) converters are used to connect the analog and digital. As can be seen, there are two sets of stereo converters; they run at 48 kHz sampling rate with 24 bits of precision for minimum impact on the analog sound.

Each voice is completely independent, except the single stereo External Signal Input is routed to all four voices.

Inputs and Outputs

There are a bunch of audio jacks on the rear panel. All are stereo pairs (two mono jacks), and unbalanced. First, there are the External Inputs, which can be routed to the input or 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 External Input jacks, where it can then be routed to another voice's input for some interesting effects.

There is also a Mix input; this input is simply mixed with the Poly's output with no level control. It is a convenience feature, for example when you have two Polys chained, or an Evolver and a Poly chained.

The last jacks are the Stereo Output mix. If you only use the Left/Mono jack, you will get a mono mix of both channels – but you really should use both channels!

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

Basic Operation

Program Mode: When the Poly is first turned on, it will be in Program Mode with the PROGRAM LED lit and the following screen active.

```
Program: xxx B: x  
xxxxxxxxxxxxxxxx
```

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 top knob will change the Program, and the bottom knob will change the Bank. The Program can also be incremented or decremented by using the PAGE UP or PAGE DOWN button respectively.

If you hold the SHIFT button while changing the Program or Bank, the sound will not change until you release the SHIFT button. If you hold the SHIFT button while changing the Program or Bank and the sequencer is running, when the SHIFT button is released the sequence will complete (according to the length of Sequence 1) before synchronously changing to the new program and it's sequence.

Edit Program Mode: To edit a Program, simply hit the EDIT button while in Program mode. See the Program Parameters section for a detailed list of all parameters and their functionality.

Combo Mode: When the COMBO button is hit, it will switch to Combo Mode with the following screen active.

```
Combo:   xxx B: x  
xxxxxxxxxxxxxxxx
```

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 top knob will change the Combo, and the bottom knob will change the Bank. The Combo can also be incremented or decremented by using the PAGE UP or PAGE DOWN button respectively.

Edit Combo Mode: To edit a Combo, simply hit the EDIT button while in Program mode. See the Combo Parameters section for a detailed list of all parameters and their functionality.

Program or Combo Save: Hit the WRITE button and the following screen will appear:

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

Simply hit the YES button to save the current Program or Combo, or NO if you changed your mind. To store in a different location, use the upper parameter knob to select a the new Program or Combo destination, and the lower knob for a different bank.

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

While there is a write pending (see screen above), you can hit the COMPARE switch to hear what is in a possible target Program or Combo destination before saving. Just be sure to turn Compare off again before you actually hit the YES button to save.

Voice Assignment: The Poly has four voices, and as such has to use a specific method for assigning the four voices as MIDI notes are received. 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 is to steal 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 is when Poly Chain in 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 Poly downstream.

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 will be 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 more wild results.

Global Parameters

To edit the Global parameters, just hit the GLOBAL button at any time, and Global page 1 is displayed. The upper knob changes the parameter on the upper LCD line, and the lower knob changes the lower parameter. The PAGE UP and PAGE DOWN buttons select the other pages.

Note: If you hold the PAGE DOWN button while you hit the PAGE UP button, it will jump to the last page. Similarly, if you hold the PAGE UP button when you hit the PAGE DOWN button, it will jump to the first page.

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

Page 1:

```
Tempo (BPM): xxx
Clock Div: xxxxxx
```

Top Line: **Tempo 30...250** 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 Use Program Tempo is On, the Tempo and Clock Divide will both be updated on every Program or Combo change.

Bottom Line: **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, etc.), 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
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

Page 2:

Transpose:	xx
Fine Tune:	xx

Top Line: **Transpose: -36...+36**
centered. Steps in semitones.

Master Transpose control, 0 is

Bottom Line: **Fine Tune: -50...+50**
Steps in cents (50 cents = 1/2 semitone).

Master Fine Tune control; 0 centered.

Page 3:

MIDI Channel:	xx
Poly Chain:	xx

Top Line: **MIDI Channel: ALL, 1...16**

Select which MIDI channel to send and receive data, 1 to 16. All receives on any channel.

Bottom Line: **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 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.

Page 4:

Clock:	xxxxxxxx
Prog Tempo:	xx

Top Line: **Clock: see table**
External sequencer triggers, as follows:

Selects the MIDI clock status, and enables

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.

Bottom Line: **Prog Tempo: Off, On** Use Program Tempo – 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 5:

```
Input Gain: xxxxxx
LCD Contrast: xx
```

Top Line: **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.

Bottom Line: **LCD Contrast: 1...100** This sets the contrast level for the LCD.

Page 6:

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

MIDI Dumps: see table This screen 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 button is hit, the transmission will start. Handy for saving Programs on a computer or sending to another Poly. The Poly's dumps include Program and Bank numbers, so when received it will be stored in same location.

Program Parameters

The Poly has 128 parameters in a Program, plus another 64 Sequence parameters, followed by the 16 character Program Name. These parameters are the same as in Evolver. Following is a description of every parameter.

The upper knob selects the Parameter, and the lower knob changes the value. The PAGE UP and PAGE DOWN buttons step through parameter groups.

Note: If you hold the PAGE DOWN button while you hit the PAGE UP button, it will jump to the last page. Similarly, if you hold the PAGE UP button when you hit the PAGE DOWN button, it will jump to the first page.

The parameters are listed in this section in groups according to the pages; the upper LCD line displays the current page, and the lower line shows the parameter name and value.

Page 1:

Oscillator 1

Oscillator 1 is an analog oscillator, and is hardwired to the Left channel. Following are the main controls for Oscillator 1. Note that there are some additional modulation controls that will affect Oscillator 1 – these are found in different sections of the Parameter definitions.

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, etc.), the second octave is -1 (c -1, c#-1, etc.), the third is zero (c 0, c# 0...), etc.

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

Shape: **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 to 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 Oscillator 1.

Glide: **0...100; F02...F99; OFF** The oscillator 1 Glide rate; low numbers 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 F02 to F00 (equivalent to glides of 2 to 100).

Thought not quite Glide related, if you set glide all the way to maximum, it goes to OFF, which has the effect of disconnecting oscillator 1 from MIDI.

Sync: Turns oscillator hard sync on or off. Whenever oscillator 2 resets, it will also reset oscillator 1 for the classic hard sync sound.

Page 2:

Oscillator 2

Oscillator 2 is also an analog oscillator, and is hardwired to the Right channel. The parameters for Oscillator 2 are the same as Oscillator 1 above, except there is no Sync control.

Page 3:

Oscillator 3

Oscillator 3 is a digital waveshape oscillator, and is hardwired to the Left channel. Like the original Prophet VS, the digital oscillators in Evolver get quite trashy at higher frequencies. Following are the controls for Oscillator 3:

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, etc.), the second octave is -1 (c -1, c#-1, etc.), the third is zero (c 0, c# 0...), etc.

Fine Freq: -50...+50 Fine Tune control; 0 centered. Steps in cents (50 cents = 1/2 semitone).

Wave Shape 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 Editor.

Level: 0...100 Sets the volume of Oscillator 1.

Glide: 0...100; F02...F99; OFF The oscillator 1 Glide rate; low numbers 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 F02 to F00 (equivalent to glides of 2 to 100).

Thought not quite Glide related, if you set glide all the way to maximum, it goes to OFF, which has the effect of disconnecting oscillator 1 from MIDI.

FM 4 → 3: *0...100* The amount of Frequency Modulation of Oscillator 3 from Oscillator 4. Note that each digital oscillator can FM the other at the same time for some wild results.

Shape Seq: *Off, SE1..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.

Ring Mod 4>3: *0...100* The amount of Ring (Amplitude) Modulation of Oscillator 3 from Oscillator 4. Note that each digital oscillator can Ring modulate the other at the same time.

Page 4:

Oscillator 4

Oscillator 4 is a digital waveshape oscillator, and is hardwired to the Right channel. The parameters for Oscillator 2 are the same as Oscillator 1 above, except the FM and Ring Mod parameters go in the opposite direction.

Page 5:

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 driven together in tandem, so they normally respond the same way. Exceptions are when using the Spilt parameter as noted below, 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.

Frequency: *0...164* Selects 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.

Config: *2 Pole, 4 Pole* Selects either 2 or 4 pole operation for the filter.

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

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

Env Attack: 0...110 Attack time of the filter ADSR envelope generator

Env Decay: 0...110 Decay time

Env Sustain: 0...100 Sustain Level

Env Release: 0...110 Release time

Keyboard Amt: 0...100 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, etc. Also, the MIDI note is derived using Oscillator 1 Glide, allowing Glide tracking.

Audio Mod: 0...100 Amount of audio modulation from the analog oscillator to the filter, separate in left and right channels.

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; this allows a way to unlock them.

Page 6:

VC Amplifier

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, then the Envelope Amount will have no effect.

Env Velocity: 0...100 Amount of MIDI velocity controlling the level of the VCA envelope.

Envelope Amt: 0...100 Amount of VCA envelope to the VCA level.

Env Attack: 0...110 Attack time of the VCA ADSR envelope generator

Env Decay: 0...110 Decay time

Env Sustain: 0...100 Sustain Level

Env Release: 0...110 Release time

Output: see table pan settings as below. 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

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

Page 7:

Tuned Feedback

Feedback is implemented via two identical tuned delay lines, one for each channel – see the diagram on page 12. 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). Assign a sequence to Feedback Frequency, 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** 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 will not have any effect at lower levels of feedback.

Page 8:

Delay

The delay takes a mix of both channels as input, and provides up to three independent taps, each which can be separately time or level modulated. 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 1: 0...150, sync Sets the delay time of the first delay tap. 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 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 Quarter (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

Level 1: 0...100 Sets the delay amount of the first delay tap. The left and right channels are mixed into a single delay.

Time 2: *0...150, sync* Sets the delay time of the second delay tap, same ranges as Time 1.

Level 2: *0...100* Sets the delay amount of the second delay tap.

Time 3: *0...150, sync* Sets the delay time of the third delay tap, same ranges as Time 1.

Level 4: *0...100* Sets the delay amount of the third delay tap.

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

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

Page 9:

LFO 1

There are four identical Low Frequency Oscillators (LFOs) in Evolver. Following is the description of LFO 1; the other three have the same four parameters.

Frequency: *0...150, sync* Selects the frequency of LFO. 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 can't respond very well to the fastest LFO speeds, due to speed limitations of the control voltages; but it will certainly generate some interesting sounds.

Above 150 are 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; Ksync 1...100** Sets the amount of LFO. A new feature on the Poly is the ability to re-start the LFO when a new note is played (Key Sync). To select this mode of operation, set the LFO amount to a value over 100. Each LFO can be set independently.

Destination: **see table** LFO 1 destination - see the Modulation Destination table on page 34 for a list of possible destinations.

Page 10:

LFO 2

Page 11:

LFO 3

Page 12:

LFO 4

These LFOs screens are the same as LFO 1

Page 13:

Envelope 3

Amount: **-99...+99** Amount of envelope 3

Destination: **see table** Envelope 3 destination - see the Modulation Destination table on page 34 for a list of possible destinations.

Velocity: **0...100** Amount of MIDI velocity controlling the level envelope 3.

Delay: **0...100** Delay time of Envelope 3, prior to Attack

Attack: **0...110** Attack time of ADSR envelope generator 3

Decay: **0...110** Decay time

Sustain: **0...100** Sustain Level

Release: **0...110** Release time

Misc Audio

Highpass: *Out 0...99, In 0...99* Sets the cutoff frequency of the four-pole highpass filter. If set from Out 0 to Out 99, the filter is placed after the analog lowpass filter and VCA, before the Delay. Conversely, if set from In 00 to In 99, the highpass filter is inserted before the analog lowpass filter, and only affects external input. Refer to the Signal Flow diagram on page 12. There are two separate highpass filters, one for each channel, that 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.

Noise Vol: *0...100* The volume of white noise mixed into the filter. The same amount goes into both channels.

Ext In Vol: *0...100* The volume of external audio input connected to Left In and/or Right In. The same signal is routed to all four voices.

Ext In: *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	Stereo – the left channel in goes to the left channel, right to right.
Left	Left – the left channel in goes to both channels (mono in).
Right	Right – the right channel in goes to both channels (mono in).
Split	Split - A mono audio signal is input on the Right Input; a separate control audio signal (for envelope follower, peak hold, and clock source) into the Left Input.

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.

Distortion: *Out 0...99, In 0...99* Amount of distortion. If set from Out 0 to Out 99, the distortion is after the analog filter and VCA, before the Delay. If set from In 00 to In 99, the distortion is before the analog filter, and only affects external input. There are two separate distortions, one for each channel.

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 In 01 (noise gate on input signal), or Out 01 for a noise gate after the analog electronics. The noise gate uses the Left channel signal level to gate both channels.

Output Hack: *0...14* Trashes the output signal, quite rudely.

Miscellaneous

There are different ways to control the Poly Evolver; using the internal sequencer, using external MIDI controllers (keyboards, computers, etc), or using external audio sources. And, there are ways of combining these, such as gating the sequencer from a keyboard. It can get more complicated in a Combo, but here we are just discussing the Program side of things.

Control consists mainly of triggers for the envelopes, and note numbers for the oscillators. Beyond that there are all the additional modulation sources/destinations and MIDI controls. Following are the parameters used to select the different control modes.

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 button. The Trigger modes that do this are marked in the table as **AUTO**.

Trigger: **see table** Selects the source of triggers/gates for the envelope generators.

Display	Envelope Trigger Selections
Sq or MD	The envelopes will be triggered by either the sequencer or MIDI notes. 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	The envelopes will be triggered by the sequencer only.
MIDI	The envelopes will be triggered by MIDI notes only.
MIDI r st	The envelopes will be triggered by MIDI, and the sequencer will be reset on every note (if it is running). The sequencer will not trigger the envelopes.
MID Gate	Gated mode – the envelopes will only be triggered when a MIDI note is held and the sequencer is running; in other words the MIDI notes will gate the sequencer. AUTO .
MIDI G r	Gated mode, reset – same as Gated mode, except every time a MIDI note is hit, the sequencer is reset to step 1. AUTO .
Ext In	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 r	Same as external in, but also resets the sequencer to step 1.
Ext Gate	External In signal will gate the sequencer. AUTO .
Ext G r	External In signal will gate the sequencer, and also resets the sequencer to step 1 on each new gate. AUTO .
MS Once	Plays a sequence once (according to the length of Sequence 1) when a new MIDI note is received. The sequence is not restarted on multiple MIDI notes until it finishes and stops. AUTO .
MS Once R	Also plays a MIDI sequence once, but will re-start the sequence on each MIDI note. AUTO .

EiSqStep	Plays one step of the sequencer on each External Input audio trigger. AUTO .
MdSqStep	Plays one step of the sequencer on each MIDI note received. AUTO .

Key Off/Tran: **Off, -36...+36** Enables and transposes MIDI notes. If Off, MIDI notes are ignored. Otherwise, it transposes midi notes from -36 to +36 semitones (+/- 3 octaves).

Note – this is an important parameter! When this is off, MIDI notes will not work. This parameter, with the Trigger Select (above) are the main controls for selecting how Evolver plays.

Another note – you will find that there are other interactions between the sequencer and MIDI. 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.

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 (Ply), Mono (Mon), Unison 1 (Un1), and Unison 2 (Un2). 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.

Display	MIDI input mode
Low	Low note priority
LoRT	Low note priority, re-trigger envelopes
High	High note priority
HiRT	High note priority, re-trigger envelopes
Last	Last note hit priority
LaRT	Last note hit priority, re-trigger envelopes

BPM: **30...250** The Programmed basic speed for the sequencer in BPM. Works the same as the BPM in Main, but is only active when “Use Preset Tempo” is On. When Use Preset Tempo is On, changing this parameter also changes the main BPM, and vice-versa. When Off, changing this parameter has no effect.

Clock Div: *see table* Used as a clock divider to provide a wider range of sequencer speeds. Works the same as the Clock Divide in main, but is only active when "Use Preset Tempo" is on. When On, changing this parameter also changes the main 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
64trip	BPM x 24	Sixty-fourth note triplets

Page 16:

Mod Sources

Source 1: *see table* General purpose modulation source select – see list on page 36 for possible sources. Since all mod sources in Evolver have a single destination, the four general purpose Mods allow a method to send a mod source (such as a sequence or LFO) to another destination, with a different amount. Also, there are some additional mod sources such as noise and the digital oscillators available, allowing audio-rate modulation. As mentioned above, there are some destinations that are not able to keep up with audio mod, but it's fun anyway.

Note - these mod 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.

Amount 1: **-99...+99** Amount of Mod 1 modulation.

Dest 1: **see table** Mod 1 Destination - see the Modulation Destination table on page 34 for a list of possible destinations.

Mods 2 – 4: Same as Mod 1

Page 17:

MIDI Modulation

Velocity Amt: **-99...+99** Amount of MIDI Velocity modulation. The Velocity of the most recent MIDI note is used.

Vel Dest: **see table** Velocity Destination - see the Modulation Destination table on page 34 for a list of possible destinations.

Mod Whl Amt: **-99...+99** Amount of MIDI Mod Wheel modulation. This parameter has a smoothing filter, which will clean up messy MIDI controller data into a clean response. If you want to bypass the filtering, use one of the four General Purpose Modulation sets, which are unfiltered.

Mod Whl Dest: **see table** Mod Wheel Destination - see the Modulation Destination table on page 34 for a list of possible destinations.

Pressure Amt: **-99...+99** Amount of MIDI Pressure modulation, either poly or channel pressure. This parameter has a smoothing filter, which will clean up messy MIDI controller data into a clean response. If you want to bypass the filtering, use one of the four General Purpose Modulation sets, which are unfiltered.

Press Dest: **see table** Pressure Destination - see the Modulation Destination table on page 34 for a list of possible destinations.

Breath Amt: **-99...+99** Amount of MIDI Breath controller modulation. This parameter has a smoothing filter, which will clean up messy MIDI controller data into a clean response. If you want to bypass the filtering, use one of the four General Purpose Modulation sets, which are unfiltered.

Breath Des: **see table** Breath controller Destination - see the Modulation Destination table on page 34 for a list of possible destinations.

Foot Con Amt: **-99...+99** Amount of MIDI Foot controller modulation. This parameter has a smoothing filter, which will clean up messy MIDI controller data into a clean response. If you want to bypass the filtering, use one of the four General Purpose Modulation sets, which are unfiltered.

Foot Dest: **see table** Foot controller Destination - see the Modulation Destination table on page 34 for a list of possible destinations.

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Misc Modulation

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.

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

P Bend Range: **0...12** Pitch Bend Range, in semitones.

In Peak Amt: **-99...+99** Amount of Peak Hold modulation. Takes the momentary peak of the left external audio input, and uses it as a modulation signal.

InPeak Dest: **see table** Peak Mod Destination - see the Modulation Destination table on page 34 for a list of possible destinations.

Env Fol Amt: **-99...+99** Amount of Envelope Follower modulation. Generates an envelope from the Left external audio input, and uses it as a modulation signal.

EnvFol Dest: **see table** Envelope Follower Destination - see the Modulation Destination table on page 34 for a list of possible destinations.

Seq 1 Dest: **see table** Sequence 1 Destination - see the Modulation Destination table on page 34 for a list of possible destinations. Note that the Sequencer has a few additional destinations that only work on the sequencer.

Seq 2 Dest: **see table** Sequence 2 Destination

Seq 3 Dest: **see table** Sequence 3 Destination

Seq 4 Dest: **see table** Sequence 4 Destination

Pages 19, 20, 21, 22:

Seq: xx Step: xx

The next four pages are for programming the sequencer. The Page buttons will step through Sequence 1 – 4 , and the upper knob selects the steps, from 1 to 16. The lower line then shows the value, 0 to 100, Reset or Rest (Rest is only available on Sequence 1).

Sequencer Operation

Every Poly Evolver Program has a 4 x 16 “analog” style step sequencer. Imagine four rows of 16 knobs. It is really a single sequencer with four controls per step, though the convention in Evolver is to call the four “rows” sequence 1 through 4.

When you hit the START button, the sequence will start playing. In Program mode, only voice 1 plays the sequence (if one is programmed); the other 3 voices are still

controlled via MIDI. In Combo mode, each Part can have the sequencer individually enabled or disabled.

As mentioned in the Trigger section above, some Trigger modes will automatically start the sequencer for gated sequence operation. In this case, all voices in Program mode will use the sequencer, not just voice 1.

Each of the four sequences is basically a modulation source; it can be routed to any of the normal modulation destinations (see table on page 34) using the Seq Dest knobs (last row). Usually at least one of the sequences is routed to an oscillator to control pitch. Using VCA Envelope as a destination allows setting the volume of each step; likewise you can go to the Filter or Filter Envelope Amount to have different filter settings per step.

Beyond this, you can really have some fun with other destinations; go to Delay amount to have the delay level change; or feedback amount, to drastically change the sound every step. FM and Ring Mod are fun to change – 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 is 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 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.

The Sequence parameters are in the pages after the synth parameters in Program Edit – the pages jump between sequences 1 – 4 for fast editing.

Note - when routing a sequencer to an oscillator, a sequence value of 24 corresponds to one octave, i.e. each step is one half a semitone.

All four sequences can have separate lengths. This is done by selecting Reset (at the end of the range after 100) as the step value. When this step is reached, the sequence will reset to step one. For example, if you want a four step sequence, simply set step 5 to Reset.

Each sequence can have its own reset, so you will need to set the reset for all four sequences if you want all of them to be the same length. And, if each is a different length, the rests (see below) 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, which makes sense on a single voice if you think about it.

Sequence 1 controls rests. If set to Rest (after Reset at the end of the range) there will not be a trigger to the envelopes on that step. As mentioned above, the rests will end up in different places on other sequences if they are a different length.

Using rests, resets, and different Clock Divides (half swing, swing, etc.) you can achieve very complex sequences.

START/STOP starts and stops the sequencer; the RESET button will reset the sequence to step one if the sequencer is running or not running.


Note – the RESET button also acts as a MIDI all-notes-off, and resets all MIDI controllers when hit while the sequencer is not running.

While the sequencer is running, if you hold the SHIFT button when you hit the STOP button, the sequence will continue running until finished (according to the length of Sequence 1), and will stop after playing step 1.

Also, If you hold the SHIFT button while changing the program or bank and the sequencer is running, when the SHIFT button is released the sequence will complete (according to the length of Sequence 1) before synchronously changing to the new program and it's sequence.

The Shift functions only work in Program mode; in Combo mode the SHIFT button is ignored.

Page 23:



Edit Name

The lower LCD line displays the name of the Program. The upper knob selects which character is currently active, which is displayed by blinking the letter. The lower knob changes the character.

Modulation Destinations

Display	Destination
Off	No destination selected
O1Frq	Oscillator 1 Frequency
O2Frq	Oscillator 2 Frequency
O3Frq	Oscillator 3 Frequency
O4Frq	Oscillator 4 Frequency
OAFrq	Oscillator All Frequency – goes to all four
O1Lev	Oscillator 1 Level
O2Lev	Oscillator 2 Level
O3Lev	Oscillator 3 Level
O4Lev	Oscillator 4 Level
OALev	Oscillator All Level
Noise	Noise Level
Ext In	External In Level
O1 PW	Oscillator 1 Pulse width
O2 PW	Oscillator 2 Pulse width
OA PW	Oscillator All Pulse width
FM4>3	Frequency Mod (FM) Amount; Osc 4 -> 3
FM3>4	Frequency Mod (FM) Amount; Osc 3 -> 4
RM4>3	Ring Mod (Amplitude) Amount; Osc 4 -> 3
Rm3>4	Ring Mod (Amplitude) Amount; Osc 3 -> 4
LPFil	Lowpass filter frequency
Split	Filter Split –separation between left / right
Reson	Resonance
Hipas	Highpass filter
UCA	VCA amount
Pan	Pan
FB Fr	Feedback frequency
FBAmt	Filter Amount
D1Tim	Delay 1 Time
D2Tim	Delay 2 Time
D3Tim	Delay 3 Time
DATim	Delay All Time
D1Amt	Delay 1 Amount
D2Amt	Delay 2 Amount
D3Amt	Delay 3 Amount
DAAmt	Delay All Amount
D FB1	Delay Feedback 1
D FB2	Delay Feedback 2

L1Frq	LFO 1 Frequency
L2Frq	LFO 2 Frequency
L3Frq	LFO 3 Frequency
L4Frq	LFO 4 Frequency
LAFrq	LFO All Frequency
L1Amt	LFO 1 Amount
L2Amt	LFO 2 Amount
L3Amt	LFO 3 Amount
L4Amt	LFO 4 Amount
LAAmt	LFO A Amount
E1Amt	Envelope 1 Amount (Level)
E2Amt	Envelope 2 Amount (Level)
E3Amt	Envelope 3 Amount (Level)
EAAmt	Envelope All Amount (Level)
E1Att	Envelope 1 Attack Rate
E2Att	Envelope 2 Attack Rate
E3Att	Envelope 3 Attack Rate
EAAtt	Envelope All Attack Rate
E1Dec	Envelope 1 Decay Rate
E2Dec	Envelope 2 Decay Rate
E3Dec	Envelope 3 Decay Rate
EADec	Envelope All Decay Rate
E1Rel	Envelope 1 Release Rate
E2Rel	Envelope 2 Release Rate
E3Rel	Envelope 3 Release Rate
EAREl	Envelope All Release Rate
F1Frq	Filter 1 (Left) lowpass filter cutoff frequency
F2Frq	Filter 2 (Right) lowpass filter cutoff frequency
F1Res	Filter 1 (Left) lowpass filter resonance
F2Res	Filter 2 (Right) lowpass filter resonance
Dist	Distortion - will not work if distortion is set to 0 (off) or 1 (noise gate select)

Additional Sequencer-Only Modulation Destinations

Clock	Sequencer clock (BPM) multiplier
Mnote	MIDI note number
MVel	MIDI Velocity
MmodW	MIDI Mod Wheel
Mpres	MIDI Pressure
Mbrth	MIDI Breath Controller
Mfoot	MIDI Foot Controller

Modulation Sources

Display	Source
Off	No Source selected
Seq 1	Sequence 1
Seq 2	Sequence 2
Seq 3	Sequence 3
Seq 4	Sequence 4
LFO 1	LFO 1
LFO 2	LFO 2
LFO 3	LFO 3
LFO 4	LFO 4
F Env	Filter Envelope
A Env	Amp (VCA) Envelope
Env 3	Envelope 3
Peak	External Audio Input Peak
EnvFol	External Audio Envelope Follower
Mid PB	Midi - Pitch Bend
Mid MW	Midi - Mod Wheel
Mpress	Midi - Pressure
Mbreth	Midi - Breath Controller
M Foot	Midi - Foot Controller
M Vel	Midi - Note Velocity
M Note	Midi - Note Number
M 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.

The upper knob selects the parameter, and the lower knob changes the value. The PAGE UP and PAGE DOWN buttons step through the four parts, and to the Edit name page after the four parts.

Note: If you hold the PAGE DOWN button while you hit the PAGE UP button, it will jump to the last page. Similarly, if you hold the PAGE UP button when you hit the PAGE DOWN button, it will jump to the first page.

Below we describe the 16 parameters for Part 1; the other parts are identical. 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 with only 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: *Off, On* Enables or disables the Program's sequencer for this Part. Only Parts with the Sequencer enabled will respond to hitting the START button 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
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

Trigger: *see table* Selects the source of triggers/gates for the envelope generators for this Part. Note that the Sequencer and/or MIDI 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 button. The Trigger modes that do this are marked in the table as **AUTO**.

Display	Envelope Trigger Selections
Sq or MD	The envelopes will be triggered by either the sequencer or MIDI notes. 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	The envelopes will be triggered by the sequencer only.

MIDI	The envelopes will be triggered by MIDI notes only.
MIDI rst	The envelopes will be triggered by MIDI, and the sequencer will be reset on every note (if it is running). The sequencer will not trigger the envelopes.
MID Gate	Gated mode – the envelopes will only be triggered when a MIDI note is held and the sequencer is running; in other words the MIDI notes will gate the sequencer. AUTO
MIDI G r	Gated mode, reset – same as Gated mode, except every time a MIDI note is hit, the sequencer is reset to step 1. AUTO
Ext In	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 r	Same as external in, but also resets the sequencer to step 1.
Ext Gate	External In signal will gate the sequencer (sequencer must be on). AUTO
Ext G r	External In signal will gate the sequencer (sequencer must be on). And also resets the sequencer to step 1 on each new gate. AUTO
MS Once	Plays a sequence once (according to the length of Sequence 1) when a new MIDI note is received. The sequence is not restarted on multiple MIDI notes until it finishes and stops. AUTO
MS Once R	Also plays a MIDI sequence once, but will re-start the sequence on each MIDI note. AUTO
EiSqStep	Plays one step of the sequencer on each External Input audio trigger. AUTO
MdSqStep	Plays one step of the sequencer on each MIDI note received. AUTO

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 over 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.

Lo 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.

Edit Name: This is displayed on the top line when the last page is selected. The lower LCD line displays the name of the Combo. The upper knob selects which character is currently active, which is displayed by blinking the letter. The lower knob changes the character.

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 which determine the overall response of Evolver to MIDI data. Following are all the parameters that affect response to MIDI.

Global Parameters

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

Poly Chain: *see table* Poly Chain is used to link multiple Evolvers and Poly Evolvers into a polyphonic system by selectively passing MIDI data through to the MIDI out jack where it can be routed to another Poly Evolver. Note that MIDI clocks are handled separately per the MIDI Clock parameter (you will likely want to use the MIDI In and OUT clock setting). Settings:

Display	Poly Chain Status
Off	MIDI operation is normal.
On	All MIDI information is passed through to the MIDI out jack
Note	Only MIDI note data is passed through to the MIDI out jack.

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 es	MIDI clock is received, but MIDI start/stop/continue messages are ignored.

Program Parameters

Trigger: *see table* Selects the source of triggers/gates for the envelope generators.

Display	Envelope Trigger Selections
Sq or MD	The envelopes will be triggered by either the sequencer or MIDI notes. 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	The envelopes will be triggered by the sequencer only.
MIDI	The envelopes will be triggered by MIDI notes only.
MIDI r st	The envelopes will be triggered by MIDI, and the sequencer will be reset on every note (if it is running). The sequencer will not trigger the envelopes.
MID Gate	Gated mode – the envelopes will only be triggered when a MIDI note is held and the sequencer is running; in other words the MIDI notes will gate the sequencer. AUTO
MIDI G r	Gated mode, reset – same as Gated mode, except every time a MIDI note is hit, the sequencer is reset to step 1. AUTO
Ext In	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 r	Same as external in, but also resets the sequencer to step 1.
Ext Gate	External In signal will gate the sequencer (sequencer must be on). AUTO
Ext G r	External In signal will gate the sequencer (sequencer must be on). And also resets the sequencer to step 1 on each new gate. AUTO
MS Once	Plays a sequence once (according to the length of Sequence 1) when a new MIDI note is received. The sequence is not restarted on multiple MIDI notes until it finishes and stops. AUTO
MS Once R	Also plays a MIDI sequence once, but will re-start the sequence on each MIDI note. AUTO
EiSqStep	Plays one step of the sequencer on each External Input audio trigger. AUTO
MdSqStep	Plays one step of the sequencer on each MIDI note received. AUTO

Key Off/Tran: **Off, -36...+36** Enables and transposes MIDI notes. If Off, MIDI notes are ignored. Otherwise, it transposes midi notes from -36 to +36 semitones (+/- 3 octaves).

Note – this is an important parameter! When this is off, MIDI notes will not work. This parameter, with the Trigger Select (above) are the main controls for selecting how Evolver plays.

Another note – you will find that there are other interactions between the sequencer and MIDI. 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.

Key Mode: *see table* Selects the key mode when playing from a MIDI keyboard. These are only active in Combo mode when a Part is Mono.

Display	MIDI input mode
Low	Low note priority
LoRT	Low note priority, re-trigger envelopes
High	High note priority
HiRT	High note priority, re-trigger envelopes
Last	Last note hit priority
LaRT	Last note hit priority, re-trigger envelopes

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.

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 over 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.

Lo 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.

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

Display	Envelope Trigger Selections
Sq or MD	The envelopes will be triggered by either the sequencer or MIDI notes. 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	The envelopes will be triggered by the sequencer only.
MIDI	The envelopes will be triggered by MIDI notes only.
MIDI rst	The envelopes will be triggered by MIDI, and the sequencer will be reset on every note (if it is running). The sequencer will not trigger the envelopes.
MIDI Gate	Gated mode – the envelopes will only be triggered when a MIDI note is held and the sequencer is running; in other words the MIDI notes will gate the sequencer. AUTO
MIDI G r	Gated mode, reset – same as Gated mode, except every time a MIDI note is hit, the sequencer is reset to step 1. AUTO
Ext In	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 r	Same as external in, but also resets the sequencer to step 1.
Ext Gate	External In signal will gate the sequencer (sequencer must be on). AUTO
Ext G r	External In signal will gate the sequencer (sequencer must be on). And also resets the sequencer to step 1 on each new gate. AUTO
MS Once	Plays a sequence once (according to the length of Sequence 1) when a new MIDI note is received. The sequence is not restarted on multiple MIDI notes until it finishes and stops. AUTO
MS Once R	Also plays a MIDI sequence once, but will re-start the sequence on each MIDI note. AUTO
EiSqStep	Plays one step of the sequencer on each External Input audio trigger. AUTO
MdSqStep	Plays one step of the sequencer on each MIDI note received. AUTO

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

27	Oscillator 4 Level
28	Oscillator 1 Shape
29	Oscillator 2 Shape
30	Oscillator 3 Shape
31	Oscillator 4 Shape
40	FM 4->3
41	FM 3->4
42	RM 4->3
43	RM 3->4
62	Noise Level
52	Low Pass Filter Frequency
53	Filter Resonance
54	Filter Envelope Amount
55	Filter Attack
56	Filter Decay
57	Filter Sustain
58	Filter Release
59	Filter Audio Mod
60	Filter Split
61	Filter Key Amount
75	Amp Attack
76	Amp Decay
77	Amp Sustain
78	Amp Release
13	Highpass Filter Cutoff
85	Feedback Frequency
86	Feedback Level
12	Distortion
102	Delay 1 Time
103	Delay 2 Time
104	Delay 3 Time
105	Delay 1 Amount
106	Delay 2 Amount
107	Delay 3 Amount
108	Delay Feedback 1
109	Delay Feedback 2

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)

Poly 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 61.
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 59.
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 57. 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 52. It also sends a Program Name Dump message (also on page 52) 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 53

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 53.

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 52.

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 53

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 52

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 54). 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 54) = 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 54). 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 54). 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 57.
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 54). 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 F6 F5 F4 F3 F2 F1 F0
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.

Start/Stop Button

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0000	Evolver ID
0000 0001	File Version
0001 0010	Start/Stop button
1111 0111	End of Exclusive (EOX)

Reset Button

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

Shift Button On

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0000	Evolver ID
0000 0001	File Version
0001 0011	Shift Button On
1111 0111	End of Exclusive (EOX)

Shift Button Off

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

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 . 3 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

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 4 Eighth Note 5 Eighth Note half swing 6 Eighth Note full swing 7 Eighth Note triplets 8 Sixteenth Note 9 Sixteenth Note half swing 10 Sixteenth Note full swing 11 Sixteenth Note triplets 12 Thirty-second Notes 13 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 MIDI notes 1 Seq – The envelopes will be triggered by the sequencer only. 2 MIDI – The envelopes will be triggered by MIDI notes only. 3 MIDI Reset– Same, with sequencer reset on Note On 4 Combo - Envelopes will only be triggered with both a MIDI note 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 Midi note plays sequence once
					11 Midi note plays sequence once, resetting on multiple notes
					12 External Trigger – the sequence plays once on an external signal
					13 MIDI trigger – the sequence plays once when a MIDI note is received
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 - 200	LFO 1 Amount (over 100 repeats with Key sync on)
43	0 - 68	LFO 1 Destination (see destination table on page 67)
44	0 - 160	LFO 2 Frequency (same as LFO 1)
45	0 - 4	LFO 2 Shape (same as LFO 1)
46	0 - 200	LFO 2 Amount (over 100 repeats with Key sync on)
47	0 - 68	LFO 2 Destination (see destination table on page 67)

Parameter	Range	Description
48	0 - 198	Envelope 3 Amount; -99 to +99
49	0 - 68	Envelope 3 Destination (see destination table on page 67)
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 MIDI notes 1 Seq – The envelopes will be triggered by the sequencer only. 2 MIDI – The envelopes will be triggered by MIDI notes only. 3 MIDI Reset– Same, with sequencer reset on Note On 4 Combo - Envelopes will only be triggered with both a MIDI note 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 Midi note plays sequence once 11 Midi note plays sequence once, resetting on multiple notes 12 External Trigger – the sequence plays once on an external signal 13 MIDI trigger – the sequence plays once when a MIDI note is received
55	0 - 73	Key Off / Transpose – 0 = MIDI notes ignored. 1 = -36 semitones MIDI transpose, 37 = no transposing, 73 = +36 semitones

Parameter	Range	Description
56	0 - 75	Sequencer 1 Destination (see destination table on page 67)
57	0 - 75	Sequencer 2 Destination (see destination table on page 67)
58	0 - 75	Sequencer 3 Destination (see destination table on page 67)
59	0 - 75	Sequencer 4 Destination (see destination table on page 67)
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 - 5	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

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 69)
86	0 - 198	Modulation 1 Amount; -99 to +99
87	0 - 68	Modulation 1 Destination (see destination table on page 67)

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 69)
91	0 - 198	Modulation 2 Amount; -99 to +99
92	0 - 68	Modulation 2 Destination (see destination table on page 67)
93	0 - 24	Modulation 3 Source (see Source Table on page 69)
94	0 - 198	Modulation 3 Amount; -99 to +99
95	0 - 68	Modulation 3 Destination (see destination table on page 67)

Parameter	Range	Description
96	0 - 24	Modulation 4 Source (see Source Table on page 69)
97	0 - 198	Modulation 4 Amount; -99 to +99
98	0 - 68	Modulation 4 Destination (see destination table on page 67)
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 - 200	LFO 3 Amount (over 100 repeats with Key sync on)
107	0 - 68	LFO 3 Destination (see destination table on page 67)
108	0 - 160	LFO 4 Frequency (same as LFO 1)
109	0 - 4	LFO 4 Shape (same as LFO 1)
110	0 - 200	LFO 4 Amount (over 100 repeats with Key sync on)
111	0 - 68	LFO 4 Destination (see destination table on page 67)

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 67)
116	0 - 198	External Input Envelope Follower Amount; -99 to +99
117	0 - 68	External Input Envelope Follower Destination (see destination table on page 67)
118	0 - 198	Velocity Amount; -99 to +99
119	0 - 68	Velocity Destination (see destination table on page 67)

Parameter	Range	Description
120	0 - 198	Mod Wheel Amount; -99 to +99
121	0 - 68	Mod Wheel Destination (see destination table on page 67)
122	0 - 198	Pressure Amount; -99 to +99
123	0 - 68	Pressure Destination (see destination table on page 67)
124	0 - 198	Breath Controller Amount; -99 to +99
125	0 - 68	Breath Controller Destination (see destination table on page 67)
126	0 - 198	Foot Controller Amount; -99 to +99
127	0 - 68	Foot Controller Destination (see destination table on page 67)

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	Midi - Pitch Bend
15	Midi - Mod Wheel
16	Midi - Pressure
17	Midi - Breath Controller
18	Midi - Foot Controller
19	Midi – Note Velocity
20	Midi – Note Number
21	Midi – Expression
22	Noise
23	Oscillator 3
24	Oscillator 4

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