PROPHET 12

Module

Operation Manual

Dave Smith
INSTRUMENTS

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FC Tested To Comply
With FCC Standards
FOR OFFICE USE

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Credits and Acknowledgements

For Sound Design:

Thank You

I've been designing synthesizers for 35 years now, starting with the Prophet-5 in 1978. Often times over the years, people have asked which instrument is my favorite. I've never been able to answer that question; it's like picking your favorite child. The Prophet-5 since it was the first, and a breakthrough instrument? The Evolvers with their hybrid analog/digital architecture? The Prophet '08, as a modern analog poly synth, a full-featured followup 30 years after the Prophet-5? The Prophet VS? Wavestation?

The problem is now resolved: the Prophet 12 is my favorite. No question. It sounds different than my other designs, yet it retains the Prophet vibe. There's something magical about the combination of a digital front end followed with analog filters and electronics per voice. The Prophet 12 has a sound, a soul of its own, unlike any other instrument. I love it!

I hope you enjoy playing this instrument as much as we enjoyed designing it. Thanks for the purchase, from the team at DSI!

Cheers,

Dave Smith

Your Prophet 12 Module is Hot!

Figuratively and literally. Under normal operating conditions, that is not a cause for concern. The Prophet 12 Module packs a lot of DSP power and analog circuitry into a very compact instrument and, as a result, it can generate a fair amount of heat.

Since you're reading the manual, you have probably noticed that the module's enclosure is well ventilated on both the bottom and rear. Do not obstruct the vents when it's powered on and avoid placing it in a small enclosed space with little or no air circulation. We also discourage use in direct sunlight under any circumstance, but particularly when the ambient temperature is high.

Overview

This is a brief overview of the Prophet 12 module, describing its capabilities and its operation. More in-depth information about specific parameters can be found in the reference section of the manual. However, don't let a lack of familiarity with either the instrument or sound synthesis prevent you from turning knobs and pressing buttons—that's what they're there for! You won't break anything and you can always get back to where you started, even if you have no idea what you're doing. Great things can occur with synthesizers when you don't quite know what to expect, so start twiddling and keep your ears—and mind—open.

Getting Started

The Prophet 12 module is a twelve-voice, polyphonic synthesizer, which allows up to twelve distinct notes to play simultaneously. We refer to the Prophet 12 as a hybrid synthesizer. That is, it uses a combination of digital and analog audio electronics to generate its sounds, called *programs*.

The Prophet 12 contains 792 programs organized into eight banks of 99. Half the programs are in four Factory banks and the rest are in four User banks. When a Prophet 12 leaves the factory, the User banks are an exact copy of the Factory banks. Program 1 in bank 1 of the User banks is the same as program 1 in bank 1 of the Factory banks, User program 2 is the same as Factory program 2, and so on. All programs in either the Factory or User banks can be edited using the front panel controls, but the edits cannot be saved to the Factory banks, only the User banks. The Factory banks are read-only, permanent.

Choosing programs is simple. Use the BANK SELECT knob to choose User banks (U1, U2, U3, U4), or Factory banks (F1, F2, F3, F4), and then use the PROGRAM SELECT knob to select program number, 01 through 99.

While auditioning programs, it should become obvious that some programs are split—two different sounds can be played from different zones of the keyboard—and some are stacked—one sound is layered on another. The Prophet 12 is bi-timbral. That is, it can play two different sounds simultaneously and each of those sounds can be routed to its own stereo outputs, if desired. Each of the Prophet 12's program memory locations is capable of saving and recalling two different programmed sounds, one in layer A and one in layer B. Layers are used to facilitate split and stacked programs.

A split program maps the layer A sound to a key zone on the left side of the split point and the layer B sound to the right. Six voices are allocated to each key zone.

A stacked program maps both layers A and B to the entire keyboard, with six voices allocated to each layer. So, when STACK A + B is on, the maximum polyphony is six. (At least two voices play with each keystroke.) The voice activity LEDs indicate how the voices are being used.

If SPLIT A | B or STACK A + B are not on, the layer B sound can still be accessed and edited by pressing EDIT LAYER B. This also provides a shortcut to switch quickly between two sounds without actually changing programs.

Using the Display and "Soft" Controls

The Prophet 12's parameters are all accessible by pressing the associated front panel switch, and then editing the parameters via the OLED display. It's a quick and easy method of getting to the control you want without having to drill down though endless menus. Synth parameters are selected and tweaked using the four *soft knobs* and *soft keys* located above and below the display. The soft knobs are detented encoders and are great for dialing in specific values.

The "Soft Knobs"

The "Soft Keys"
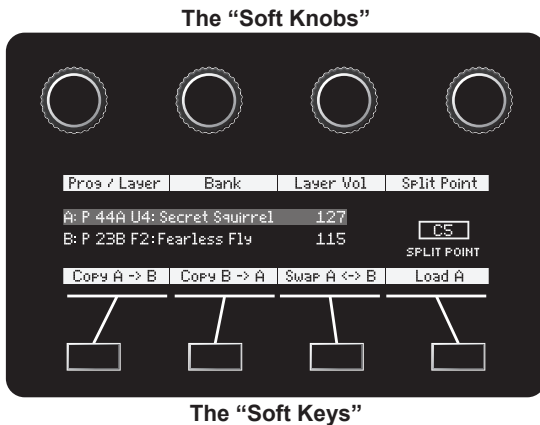
Using Compare

At any point while editing a program, turn on COMPARE to hear the saved, unedited program. Or, to revert to the saved program, just reload it by momentarily selecting another bank using the BANK SELECT knob. When you switch back to the original bank, the unedited program will be restored.

Saving Programs

Saving an edited program is easy. As mentioned previously, you can compare the edited program to the saved program at any time using COMPARE. Once you're ready to commit, press WRITE. Press the flashing WRITE button again to save.
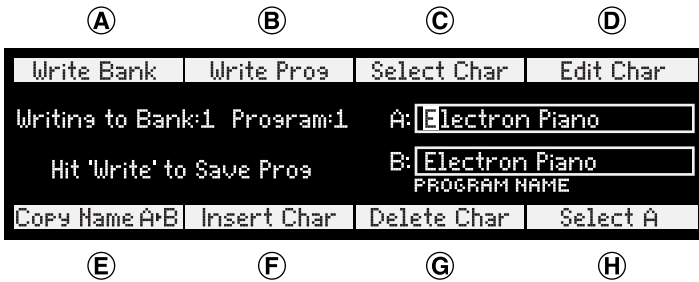
A. **Write Bank** (soft knob 1)—Choose the User Bank (1 through 4) to which the program will be saved.

B. **Write Program** (soft knob 2)—Choose the program (1 through 99) to which the program will be saved.

C. **Select Char** (soft knob 3)—Highlight a character in the current layer's name.

D. **Edit Char** (soft knob 4)—Choose a character.

E. **Copy Name** A > B (soft key 1)—Copy the layer A name to layer B.

F. **Insert Char** (soft key 2)—Insert a character before the selected character.

G. **Delete Char** (soft key 3)—Delete the selected character.

H. **Select A/B** (soft key 4)—Switch between the layer A and layer B name.

Saving a program overwrites a previously saved program. While WRITE is blinking, COMPARE lets you "audition" the saved program in the bank and program location you have selected, However, WRITE is disabled when COMPARE is On.

Moving to the Next Level

This overview just covers basic operation. The Prophet 12 is a deep instrument filled with possibility and playing it is a lot more compelling than reading a manual. But we would like to point you in the direction of a few things that will help you tailor the instrument to your needs. In particular, check out the *Global Settings* section of the manual. Read about Pot Modes and determine which works best for you. You'll also find information about MIDI setup to

more effectively integrate the Prophet 12 into your rig, as well as information about using a footswitch and expression pedals. Also, look for the tips and notes scattered throughout the manual to gain a better working knowledge of the instrument.
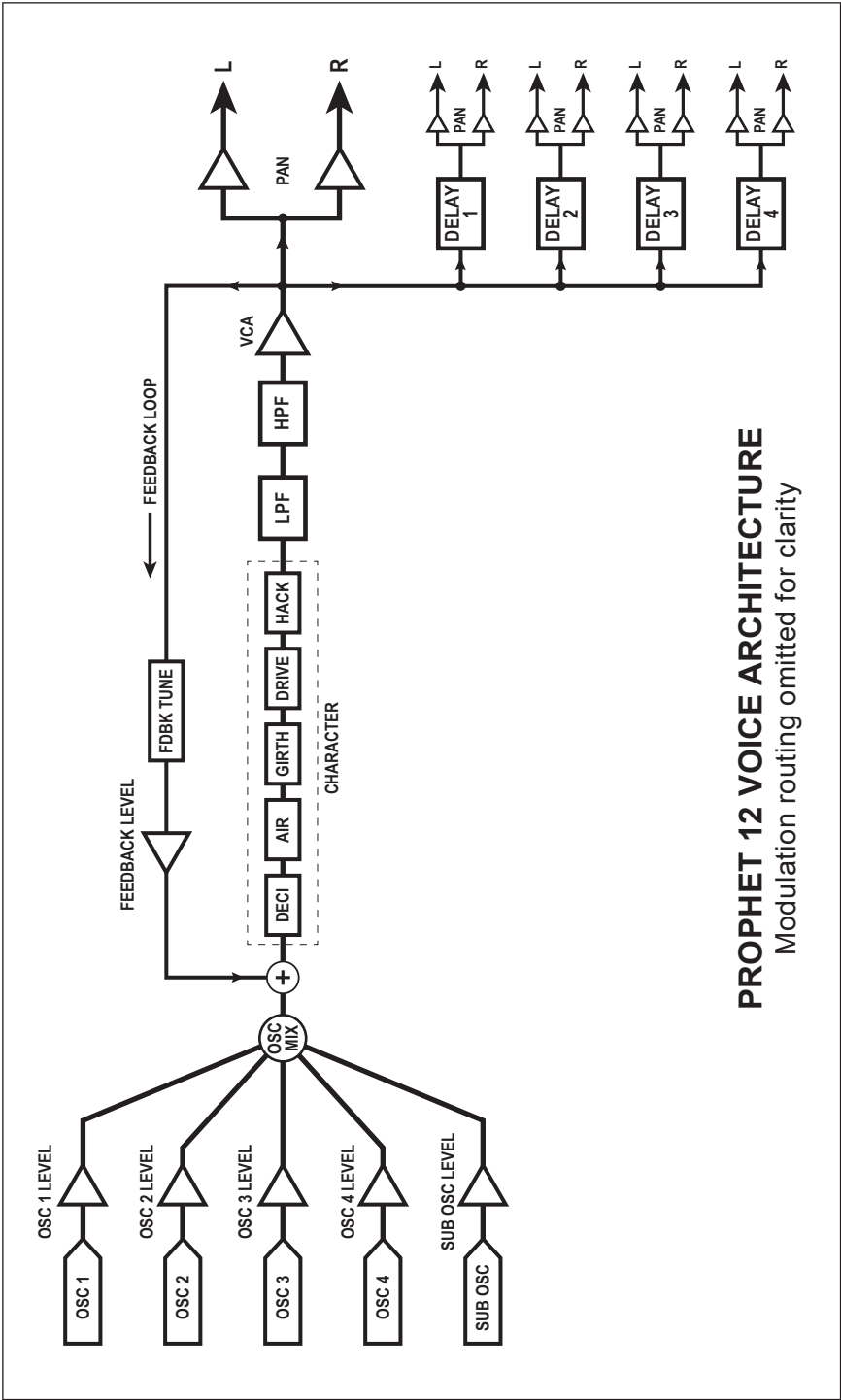
PROPHET 12 VOICE ARCHITECTURE
Modulation routing omitted for clarity

L R

PAN

DELAY 1 L R PAN
DELAY 2 L R PAN
DELAY 3 L R PAN
DELAY 4 L R PAN

VCA

HPF

LPF

HACK

DRIVE

GIRTH

AIR

DECI

CHARACTER

FEEDBACK LOOP

FDBK TUNE

FEEDBACK LEVEL

OSC MIX

+

OSC 1 LEVEL OSC 1
OSC 2 LEVEL OSC 2
OSC 3 LEVEL OSC 3
OSC 4 LEVEL OSC 4
SUB OSC LEVEL SUB OSC

Connections

AC Power Inlet—Accepts 13.5VDC at 1400mA from the supplied external power supply. The tip of the plug is positive (body is ground).
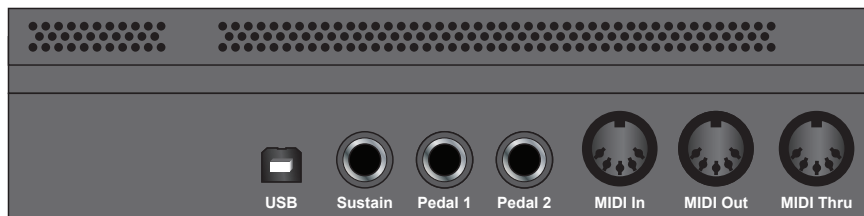
USB—For bidirectional MIDI communication with a computer. The Prophet 12 is a Class Compliant USB device and does not require additional drivers when used with Mac OS or Windows. The Prophet 12 transmits and receives data via USB, but does not transmit audio.

> **Note:** MIDI In and USB should not be used at the same time, as overlapping messages from different sources may cause the Prophet 12 to respond unpredictably. MIDI Out and USB can be used at the same time and transmit the same data.

See *Using USB* on page 47 for more information.

Sustain—Accepts a momentary, normally open or normally closed footswitch to control sustain or to turn the arpeggiator on and off. See "Sustain Footswitch" under *Global Settings* on page 10 for more information.

Pedal 1 and Pedal 2—Accept a standard expression pedal that has a variable resistor on a TRS (tip-ring-sleeve) ¼" phone plug. For more information, see "Pedal 1 Function" and "Pedal 2 Function" in *Global Settings* on page 10.

MIDI In, Out, and Thru—Standard 5-pin MIDI DIN connectors.

Main/A Outputs and B Outputs—Unbalanced, ¼″ audio outputs. The Main outputs are a mix of a program's A and B layers. When plugs are inserted into the B outputs, only layer A is available from the Main outputs and layer B is routed to the B outputs. See *Layers, Split, and Stack* on page 44 for more information.
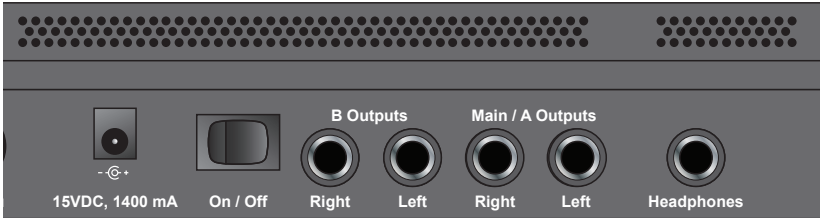
The Prophet 12 sounds great in stereo, but can be switched to mono. See "Mono/Stereo" in *Global Settings* on page 9.

Power Switch—Turns the Prophet 12 On of Off.

Headphones—A ¼″ stereo headphone jack.

Global Settings

Press G<small>LOBAL</small> to set those parameters, such as Master Tune and MIDI Channel, which affect all programs globally.

1. Master Coarse Tune: -12…+12—Master Transpose control, 0 is centered. Steps in semitones as much as one octave up (+12) or down (-12).

2. Master Fine Tune: -50…+50—Master Fine Tune control; 0 centered. Steps in cents as much as a quarter-tone up (+50) or down (-50).

3. MIDI Channel: All, 1…16—Selects which MIDI channel to send and receive data, 1 to 16. All receives on all 16 channels.

4. MIDI Multi Mode: Off, On—Allows the A & B layers to be controlled by separate MIDI channels. When On, the MIDI channel for layer B will be channel (A+1) and shown in parenthesis, i.e. 1(B:2) in the MIDI channel display (above).

5. MIDI Clock Mode: See table—Sets the Prophet 12's ability to send and receive MIDI clock messages.

Display	MIDI Clock Setting
Off	MIDI Clock is neither sent nor received.
Master	MIDI Clock is sent, but not received.
Slave	MIDI Clock is received, but not sent.
Slave Thru	MIDI Clock is received and passed to MIDI Out.

> **Note:** In Slave and Slave Thru modes, if no MIDI clock is present at the selected input, the arpeggiator will not function.

6. MIDI Clock Cable: MIDI Port, USB—Sets the port, MIDI or USB, by which MIDI clocks are received.

7. MIDI Param Send: Off, CC NRPN—Changes to the values of front panel controls are transmitted via MIDI as Non-registered Parameter Number (NRPN) controllers or as Continuous Controllers (CC). Transmission of parameters can also be turned off. See *MIDI Implementation* on page 55 for details.

> **Note:** NRPNs are the preferred method of parameter transmission, since they cover the complete range of all parameters, while CCs are limited to a range of 128.

8. MIDI Param Receive: Off, CC NRPN—Sets the method by which parameter changes are received via MIDI. As with transmission, NRPNs are the preferred method.

9. MIDI Control Enable: Off, On—When On, the synth will respond to MIDI controllers, including Pitch Wheel, Mod Wheel, Pedal, Breath, Volume, and Expression.

10. MIDI Sysex Enable: Off, On—When On, the synth will respond to received MIDI SysEx messages, and will transmit them, when prompted, to the MIDI Out. See *Sysex Messages* on page 83 for details.

11. MIDI Sysex Cable: None, MIDI Port, USB—Sets the port, MIDI or USB, by which System Exclusive data will be transmitted and received.

12. MIDI Out Select: Off, MIDI, USB, MIDI+USB—Sets the port by which MIDI data will be transmitted.

13. Local Control: Off, On—When on (the default), the front panel controls directly affect the Prophet 12. When off, the controls are transmitted via MIDI but do not directly affect the "local" synth (that is, the Prophet 12). This is primarily useful for avoiding MIDI data loops that can occur with some external sequencers.

14. Mono/Stereo: Stereo, Mono—The Prophet 12 defaults to stereo operation. When set to Mono, this parameter defeats all pan settings and modulation, effectively making each of the outputs a mono output.

15. Pot Mode: Relative, Passthru, Jump—The rotary controls on the Prophet 12's front panel are a mixture of "endless" rotary encoders and potentiometers or "pots." The pots are identifiable by their lined knobs and the fact that they have about 300° of travel. There are three pot modes to determine how the synth reacts when the programmable parameters are edited. (Master volume is not programmable, so these modes don't apply.)

When set to Relative, changes are relative to the stored setting. In Relative mode, the full value range is not available until either the minimum or maximum value and the respective lower or upper limit of the pot's travel is reached.

For example, the Resonance parameter has a value range of 0 to 127. Let's say the physical position of the Resonance pot is the equivalent of a value of 100. If you switch to a program that has a stored Resonance setting of 63 and turn the pot all the way up, it will only go to 90. To get to the maximum value of 127, you first have to turn down until the value is at the other extreme and the pot is at the limit of its travel (in this case, 0 and fully counter-clockwise, respectively).

In Passthru mode, turning the pot has no effect until after the edited value equals the preset value (that is, until the edited value "passes through" the stored value).

Jump mode uses an absolute value based upon the position of the pot when edited: turn a pot and the value jumps immediately from the stored value to the edited value.

16. Sustain Footswitch: Normally Open, Normally Closed—There are two types of momentary footswitches, normally open and normally closed. Either type can be used with the Prophet 12's Sustain switch input. Not sure which type you have? If the footswitch's behavior is the opposite of what's expected—that is, down is off and up is on—changing this setting will correct that.

17. Sustain Pedal Function: Sustain, Arp On/Off—The footswitch can be used for sustain or to turn arpeggiator hold on and off.

18. Pedal 1 Function: Breath Control, Foot Controller, Expression, Master Volume, Lowpass Filter: Full Range, Lowpass Filter: Half Range—Sets the function/destination for the Pedal 1 input. An expression pedal can be routed to any destination using the modulation matrix. See *Modulation* on page 32 for more information.

19. Pedal 2 Function: Breath Control, Foot Controller, Expression, Master Volume, Lowpass Filter: Full Range, Lowpass Filter: Half Range—Sets the function/destination for the Pedal 2 input. . An expression pedal can be routed to any destination using the modulation matrix. See *Modulation* on page 32 for more information.

20. Basic Patch—Press Write Now (soft key 1) to load a basic, template program into the edit buffer. Use Write to permanently save any changes to memory.

21. Autotune Filters—Press Start Tuning (soft key 1) and follow the onscreen instructions to tune the low- and high-pass filters.

> **Note:** The filters are calibrated at the factory and under normal circumstances should not require re-calibration or re-tuning.

22. Reset Globals—Sets the global parameters to the factory default settings.

23. Dump Current Program—Transmits the current program in SysEx format via the selected MIDI port. (See "9. MIDI Sysex Cable.") Dumped programs will load back into the same bank and program location in memory when received by the Prophet 12 via MIDI.

24. Dump Current Bank—Transmits the current bank in SysEx format via the selected MIDI port. (See "9. MIDI Sysex Cable.") Dumped banks will load back into the same bank location in memory when received by the Prophet 12 via MIDI.

25. Dump All User Banks—Transmits all four User Banks in SysEx format via the selected MIDI port. (See "9. MIDI Sysex Cable.") Dumped banks will load back into the same bank location in memory when received by the Prophet 12 via MIDI.

Oscillators

The Prophet 12 has four oscillators for each of its twelve voices. The oscillators are capable of generating the "classic" analog wave shapes—sine, triangle, sawtooth, square—as well as more complex shapes and different types of noise.
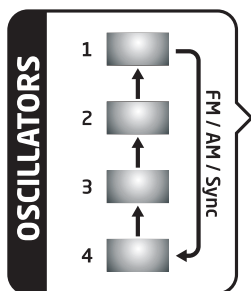
Use the four oscillator buttons to select an oscillator for editing. The arrows that connect the oscillator buttons is a graphic representation showing which oscillator affects another when the Sync, FM (frequency modulation), or AM (amplitude modulation) parameters are used. Oscillator 2 affects oscillator 1, oscillator 3 affects oscillator 2, and so on. For information about what the Sync, FM, and AM parameters do, see the relevant items later in this section.

Tip: To edit a parameter on all oscillators simultaneously, press and briefly hold any of the oscillator select buttons until all of them are lit. Select the desired parameter using Prev and Next Param (Soft keys 2 & 3). Press and hold, Hold: Edit All (Soft key 1) while adjusting one of the soft knobs. Or use the soft knobs to edit the same parameter for each oscillator individually. Press any oscillator button to exit.

Shape/Noise: Off, Sawtooth, Pulse, Triangle, Sine, Tines, Mellow, Church, Muted, Nasal, Boing, Gothic, Ahhh, Shrill, Ohhhh, Buzzzz, Meh, Red Noise, White Noise, Violet Noise—Used to select the wave shape or type of noise generated by the selected oscillator. Wave shapes include four typical analog synthesizer waves as well as twelve more complex wavetable sounds. There are also three types of noise: red, white, and violet.

Shape Mod/Pulse Width: -64…0…63—Causes the wave shape to be altered. How it changes depends upon the selected shape. A setting of 0 is the default, unaffected shape.

When Sawtooth is the selected shape, Shape Mod/Pulse Width controls the symmetry of the wave, similar to pulse width on the Pulse wave creating the rich sound of two sawtooth oscillators.

Shape Mod/Pulse Width affects the pulse width or duty cycle of the Pulse wave.

-64   0   63
                         Pulse Width
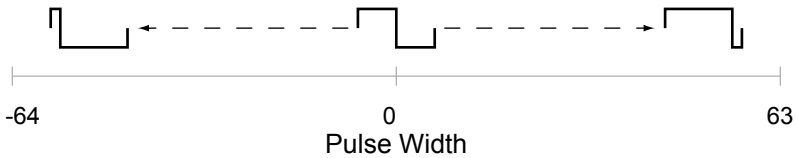
When Triangle is the selected shape, the width of the wave is changed, similar to Pulse and Sawtooth, adding harmonics and getting more thin sounding when turned in either direction from 0.

With Sine as the selected shape, values less than 0 gradually add another sine an octave higher than the base pitch. Values greater than 0 cause the sine wave to gradually be clipped, adding harmonics and sounding somewhat distorted.

For the 12 wavetable shapes, Shape Mod/Pulse Width crossfades between the selected shape and the Wave Left and Wave Right selections. Let's say, for example, that the selected wave shape is Mellow, Wave Left is set to Tines, and Wave Right is set to Nasal. A Shape Mod/Pulse Width setting of -64 will be the Tines wave, 0 will be Mellow, and +63 will be Nasal. Values between -64 and 0 will be a mix of Tines and Mellow; values between 0 and +63 will be a mix of Mellow and Nasal. An extremely broad variety of hybrid wave shapes can be created by mixing two of the wavetable shapes. And, of course, Shape Mod/Pulse Width is a modulation destination, so an LFO or other modulation source can be routed to it. Note that the algorithm used to mix the waves is not simply a mix. If all three are set to the same wave, there will still be a noticeable difference in the sound as Shape Mod changes.

Shape Mod/Pulse Width also works when noise is the selected shape. With a Shape Mod value of 0, the displayed noise type is what is heard. Values less than 0 gradually cause it to change to a second noise type. Values greater than 64 cause it to change to a third noise type. The left and right noise sources are fixed. Try it. It's much easier to hear than to explain! The display also provides a visual indication of the change.

Wave Left, Wave Right—Sets the wavetable shapes used in conjunction with the Shape Mod/Pulse Width parameter. Wave Left and Wave Right are only active when one of the twelve wavetables is selected as the primary oscillator shape. See "Shape Mod/Pulse Width" for more information.

Pitch: C 0…C 10—Sets the base oscillator frequency over a 10-octave range, from 8 Hz to 8kHz, stepping in semitones. C3 is middle C, the first octave is 0 (C0, C#0, etc.), the second octave is 1 (C1, C#1, etc.), and so on.

> **Note:** The global Master Tune settings affect the pitch of all oscillators. See *Global Settings* on page 8 for more information.

Fine: -50…+50—Fine tune control with a range of a quartertone up or down. Zero is centered. Steps are in cents (50 cents = 1/2 semitone).

Key Follow: Off, On—When Key Follow is on, the oscillator tracks the note data received via MIDI. When off, the oscillator plays at its base frequency setting, though the pitch may be affected by modulation from other sources.

Wave Reset: Off, On—When Wave Reset is off, the Prophet 12's oscillators are free running, which is typically how analog synths behave. That is, the oscillators are running whether a note is being gated on or not. When the amplifier envelope is set for a fast attack, this can cause a soft, but detectable, pop or click at the beginning of a note because the note might be gated on at a point in the wave's cycle other than a zero crossing. The first cycle to play might be truncated. For some sounds, like monophonic basses, this may actually be desirable. It adds a bit of randomness to the attack that can make it sound, for lack of a better word, more organic. When Wave Reset is on, the wave is always reset to zero—the start of its cycle—when a note is gated on.

Sync: Off, On—Turns oscillator hard sync on. Sync utilizes pairs of oscillators to force one oscillator (the slave) to restart its cycle every time the other oscillator (the master) starts a cycle. This provides a way to create more complex, harmonically rich shapes from simple waveforms.
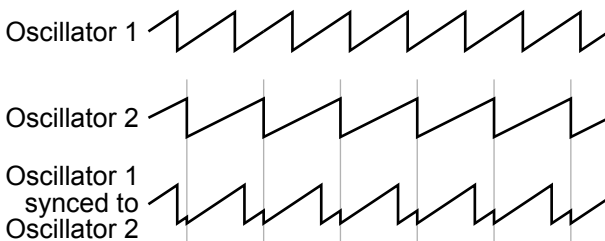
The arrows between the oscillator select buttons show how the oscillators are paired, as does the following table.

Master Osc	controls	Slave Osc
2	→	1
3	→	2
4	→	3
1	→	4

The effect of Sync is much more easily heard than explained. Here's a simple example of how to use Sync.

1. Load the Basic Patch from the Global menu. Oscillator 1 and 2 SHAPE is set to sawtooth and oscillators 3 and 4 are off.

2. Turn oscillator 2 OUTPUT LEVEL to 0. Only oscillator 1 should be audible.

3. Turn oscillator 1 SYNC on.

4. Now turn oscillator 1 PITCH while playing the keyboard. The harmonic content changes, but not the fundamental pitch. Now do the same thing while turning oscillator 2 PITCH. (Remember: only oscillator 1 should actually be audible.) The fundamental pitch changes, but the harmonic content is relatively consistent. Oscillator 2 is the master and oscillator 1 is the slave.

    Tip: Use glide, an envelope generator, an LFO, the mod wheel, or other modulation source to sweep the pitch of a slave oscillator.

Of course, each of the four oscillators can be synced, so it's possible to have two pairs of synced oscillators or to sync oscillators in series (an oscillator synced to a synced oscillator, synced to a synced oscillator…).

Note: The OSCILLATOR 1 SUB OCTAVE does not sync to oscillator 2. To sync oscillator 1 and have a sub octave that plays in tune with oscillator 2, use one of the other oscillators as a sub.

Output Level: 0…127—Sets the output level for each of the oscillators.

Note: When using three or four oscillators, it may be necessary to reduce the levels of each to avoid clipping.

Frequency Modulation (FM): 0…127—Allows one oscillator—called the *modulator*, for the purposes of FM synthesis—to modulate the frequency of another oscillator—called the *carrier*. The arrows between the oscillator select buttons show the modulator/carrier relationship between the oscillators, as does the following table.

Carrier	Modulator
Oscillator 1	Oscillator 2
Oscillator 2	Oscillator 3
Oscillator 3	Oscillator 4
Oscillator 4	Oscillator 1

Turning up FM for oscillator 1 causes it to be modulated by oscillator 2, turning up FM for oscillator 2 causes it to be modulated by oscillator 3, and so on.

> **Note:** The indicated order of modulation is really just a handy shortcut. In fact, you can route any oscillator to another using the modulation matrix. See *Modulation* on page 32 for more information.

Amplitude Modulation (AM): 0…127—As with FM, AM uses the oscillators as carrier/modulator pairs. But with AM, the modulator modulates the carrier's amplitude, not its frequency. As with FM, any oscillator routing combination can be configured using the modulation matrix.

Glide Amount: 0...127—Sets the oscillator glide (*portamento*) amount. Glide can be set independently for each oscillator. Low values are shorter/faster. The Glide switch must be on to hear the effect of Glide Amount. For a detailed explanation, see *Glide* on page 36.

> **Tip:** To set Glide Amount for all oscillators simultaneously, press and briefly hold any of the oscillator select buttons until all of them are lit. Repeatedly press Prev and Next Param (Soft keys 2 & 3) until Glide is displayed. Press and hold, Hold: Edit All (Soft key 1) while adjusting one of the soft knobs. Press any oscillator button to exit.

Slop: 0…127—Adds random detuning to the oscillator to emulate the tuning instability of voltage controlled analog oscillators, from subtle, barely perceptible amounts to wildly out of tune.

Oscillator 1 Sub Octave: 0…127—Controls the level of a sine wave oscillator pitched one octave below oscillator 1.

Character

The Character controls affect the sonic character of the mixed output of the oscillators. The effect may or may not be subtle and may be dependent upon the frequency and harmonic content of the audio being processed. For example, Girth boosts and enhances low frequencies, so the effect upon high frequency content is minimal.

Girth: 0…127—A low shelf filter to boost low frequencies, with some extra harmonic modification at higher settings.

Air: 0…127— A high shelf filter to boost high frequencies, with some extra harmonic modification at higher settings.

Hack: 0…127—Reduces the bit depth of the mixed output from the oscillators.

Decimation: 0…127—Reduces the sample rate of the mixed output from the oscillators.

Drive: 0…127— Emulates tape saturation.

Low-Pass Filter

The Prophet 12 features one analog resonant low-pass filter per voice. The filter is switchable between 2- and 4-pole modes and has a dedicated five-stage (delay/attack/decay/sustain/release) envelope generator, capable of looping the delay, attack, and decay segments. There are also controls for modulating the filter cutoff with the keyboard and envelope amount with keyboard velocity.

4-Pole—Selects the filter configuration. When lighted, the filter is in 4-pole mode. A 4-pole, low-pass filter rolls off frequencies above the cutoff frequency at a slope of 24dB per octave. When the button is off, the filter is in 2-pole mode and has a slope of 12dB per octave and a more gradual roll-off of the higher frequencies. Frequencies below the cutoff pass through unaffected, hence the name "low-pass."

Frequency: 0...164—Sets the low-pass filter's cutoff frequency over a range of more than 13 octaves, stepping in semitones. The cutoff transitions smoothly across the values when the frequency is swept.

Resonance: 0...127—Emphasizes a narrow band of frequencies around the cutoff frequency. In 4-pole mode, high levels of resonance can cause the filter to self oscillate. In 2-pole mode, resonance is much more subtle and self-oscillation does not occur.

Key Amount: 0...127—Sets the amount of modulation from the note data received via MIDI to FREQUENCY (the filter's cutoff frequency). A setting of 64 will step the filter in semitone increments for each note, 32 would be quarter-tones, and so on.

Velocity→Envelope Amount: 0...127—Enables keyboard velocity to modulate the filter ENVELOPE AMOUNT.

Envelope Amount: -127...127—Sets the amount of modulation from the low-pass filter envelope to the low-pass filter frequency. The modulation amount can be positive or negative, allowing for inverted envelope control.

> **Note:** The low-pass frequency setting may limit the effect of the envelope on the filter. For example, if FREQUENCY is all the way up, a positive envelope amount will have no effect on the filter.

Delay: 0...127—Sets a delay between the time the envelope is gated on and

when the Attack segment actually begins.

Attack: 0...127—Sets the attack time of the envelope.

Decay: 0...127—Sets the decay time of the envelope.

Sustain: 0...127—Sets the sustain level of the envelope.

Release: 0...127—Sets the release time of the envelope.

DADSR Envelope
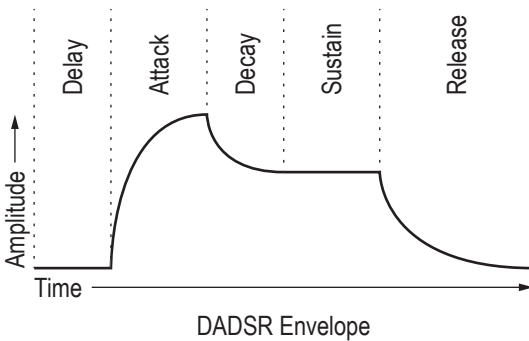
Repeat: Off, On—When on, the Delay, Attack, and Decay segments of the envelope repeat. Sustain still affects the level at which the Decay segment ends, but—instead of sustaining at a fixed level while a note is gated on—Delay, Attack, and Decay loop until the note is turned off. The Release segment begins when the note is gated off, just as it does when Repeat is off. See the illustration on the following page.
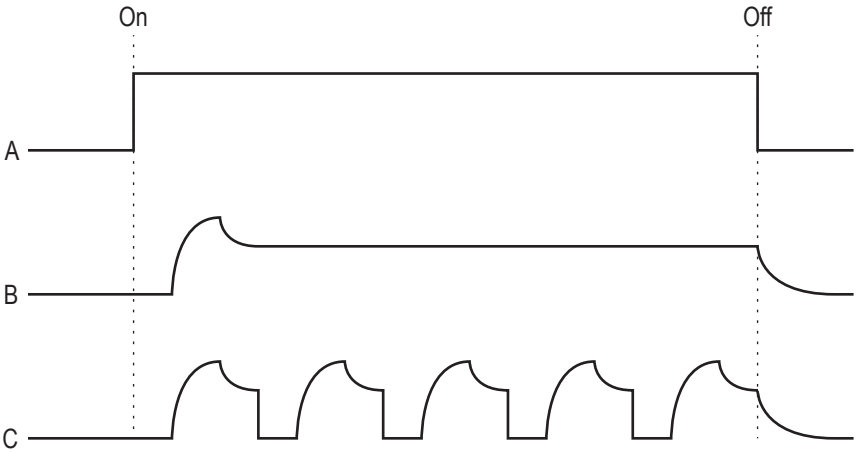
A: The gate generated by pressing, holding, and then releasing a key.
B: Corresponding DADSR envelope behavior with Delay on and Repeat off.
C: Behavior of the same envelope with Repeat on.

High-Pass Filter

After each voice's low-pass filter, the signal passes through a 2-pole, resonant analog high-pass filter. There is also a control for modulating the filter cutoff with the keyboard.

Frequency: 0...127—Sets the high-pass filter's cutoff frequency. Frequencies below the cutoff are attenuated at a slope of 12 dB per octave. Frequencies above the cutoff pass through the filter unaffected, hence the name "high-pass."

Resonance: 0...127—Emphasizes a narrow band of frequencies around the cutoff frequency. Normally, the high-pass filter does not self oscillate at the maximum resonance setting. However, it may be driven into self-oscillation by routing DC modulation to resonance to push it beyond what can be achieved by the Resonance control alone. Be aware, though, that the signal level of the self-oscillation is significantly higher than normal, and will likely cause severe

clipping, especially as more voices are played. That can be mitigated by turning down the voltage controlled amplifier envelope amount and, if used, the VCA Velocity→Amount.

Key Amount: 0...127—Sets the amount of modulation from the note data received via MIDI to Frequency (the filter's cutoff frequency). A setting of 64 will step the filter in semitone increments for each note, 32 would be quarter-tones, and so on.

> **Note:** The high-pass filter does not have a dedicated envelope like the low-pass does. However, auxiliary envelopes 3 and 4 can be routed directly to the high-pass filter, and any of the envelopes can be used to modulate the high-pass using the modulation matrix. See *Modulation* on page 32 for more information.

Voltage Controlled Amplifier

After passing through the filter stages, the signal goes into an analog voltage controlled amplifier or VCA. The VCA has a dedicated, five-stage envelope generator. (See *Low-Pass Filter* on page 18 for an illustrated example of an envelope generator.) There is a control for modulating the envelope amount using keyboard velocity, as well as a control for left/right spread of the voices in the stereo field.

Envelope Amount: 0...127—Sets the amount of modulation from the amplifier envelope to the VCA. See the following item, Velocity➔Envelope Amount, for information about setting a program's velocity sensitivity.

Velocity➔Envelope Amount: 0...127—It's very easy to misunderstand what this control does. It enables keyboard velocity to modulate the VCA Envelope Amount. What it does not do is use keyboard velocity to directly control the VCA.

To create a program in which velocity controls the VCA, turn VCA Envelope Amount down and turn Velocity➔Envelope Amount up.

To achieve the best results, it may be necessary to set an initial level using Envelope Amount. Just remember that once Envelope Amount is set to the maximum, no modulation from velocity—or any other source—will cause it to go higher than that.

Program Volume: 0...127— Sets the volume of the current program to match volumes between programs.

> **Note:** There is enough gain in the synth voice that, with some settings, some mild clipping distortion may be heard. If this happens, try lowering the Program Volume, and/or the VCA Envelope Amount (or VCA Velocity Env Amount).

Pan Spread: 0...127—Pans the audio in the stereo field individually per voice. Set to 0, all voices are panned to the center. As Pan Spread is turned up, the audio in each voice is gradually moved away from the center by different amounts. Every other voice goes in a different direction, left or right. This creates a broader stereo field while playing. Any modulation to Pan will individually move each voice from its position as set by Pan Spread.

**Delay:** 0...127—Sets a delay between the time the envelope is gated on and when the Attack segment actually begins.

Attack: 0...127—Sets the attack time of the envelope.

Decay: 0...127—Sets the decay time of the envelope.

Sustain: 0...127—Sets the sustain level of the envelope.

Release: 0...127—Sets the release time of the envelope.

Repeat: Off, On—When on, the Delay, Attack, and Decay segments of the envelope repeat. Sustain still affects the level at which the Decay segment ends, but—instead of sustaining at a fixed level while a note is gated on—Delay, Attack, and Decay loop until the note is turned off. The Release segment begins when the note is gated off, just as it does when Repeat is off. For an illustrated example, see *Low-Pass Filter* on page 18.

Feedback

The analog output of the VCA is input to a tuned delay, whose output is mixed with the oscillators and input to the character effects. Each voice has its own tuned delay.

Feedback Amount: -127…0…127—Sets the level of feedback. As the level goes up, the feedback will eventually oscillate at the set Tuning. Medium levels of feedback add depth and movement to the sound. Negative values invert the signal producing different results than positive values.

> **Note:** Be careful when using feedback and filter settings with high resonance. It can get loud quickly!

Tuning: 0…48—Sets the base frequency of the feedback loop. It steps in semitones from C0 to C4 for a four-octave range. The frequency always tracks the keyboard. 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.

Delay

The Prophet 12 has a stereo, four-tap digital delay per voice. It can be used for simple delays or, in conjunction with modulation and short delay times, flanging and chorus effects. Simple reverbs can be built using different delay times and settings on the level and feedback of all four delays. A lowpass or highpass filter in the feedback path allows you to simulate analog tape echoes or unnatural effects. In addition, the delay time can be synced to the arpeggiator and various modulation sources can be routed to delay panning.
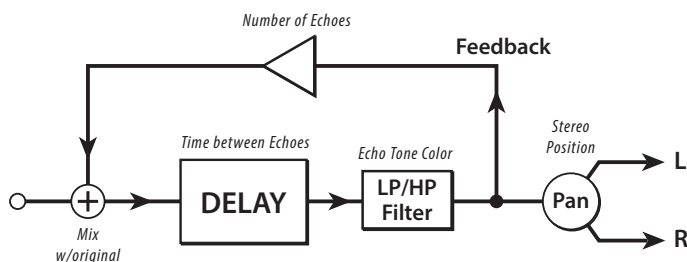
Digital Delay (x4)

The outputs of the delay are mixed back in with the synth's left and right channels, so the primary audio path from the filters forward is still entirely analog.

Delay Time: 0...255—Sets the delay time for the selected tap, from a minimum of 0.9556 milliseconds and a maximum of 1 second. For a complete list of the available delay times, see *Delay Times* on page 52.

Amount: 0...127—Sets the level of the delayed signal. When set to 0, the delay is essentially off.

Feedback: 0...127—Sets the amount of feedback from the selected delay tap to the input of the delay.

Sync: Off, On—Sets the delay time to a subdivision or multiple of the BPM setting. This allows the delay to be synced to the arpeggiator and MIDI clock. The sync settings are all based upon one beat equals one quarter note.

When Sync is on, Delay Time displays the following values.

Displayed Value	Delay Time
64th	1/16 of 1 beat
32nd	1/8 of 1 beat
32nd Dot	3/16 of 1 beat
16th	1/4 of 1 beat
16th Dot	3/8 of 1 beat
8th	1/2 of 1 beat
8th Dot	3/4 of 1 beat
Qrtr	1 beat
Qrtr Dot	1 1/2 beat
Half	2 beats
Half Dot	3 beats
Whole	4 beats

> **Note:** The maximum delay time is 1 second. The combination of longer synced delay times with slower tempos can result in delay times that would be greater than 1 second. When that happens, the delay time is divided by 2 until it no longer exceeds the 1 second limit. For example, if the BPM is set to 60 and Delay Time is set to Half, the expected delay time would be 2 seconds. The actual delay time will be 1 second (2 seconds divided by 2).

LP/HP Freq: 0…127—Sets the cutoff frequency of the lowpass or highpass filter in the output/feedback path. A lowpass setting of 127 results in no filtering. The highpass filter works just the opposite, where a setting of 127 equals maximum filtering.

Mode: Lowpass, Highpass—Selects either a lowpass or highpass filter in the output/feedback path. Use the lowpass filter to create natural sounding echoes and analog tape echo effects. The highpass filter can create interesting flange effects and unnatural sounding echoes.

Delay Pan: 0…127—Allows you to pan the output of the delay anywhere in the stereo field. This is very useful in creating a rich stereo image as well as for ping-pong effects.

Delay Pan is also a modulation destination. That is, the stereo pan position of the delayed signal can be modulated using an LFO or any mod source in the modulation matrix.

Reverb and Modulation-Based Effects

A reverb is effectively multiple delays of a source signal as it moves through a space and bounces off of various surfaces. Convincing small to medium sized rooms, spring, and plate reverb effects can be simulated using the four delay paths, feedback paths, and amounts. Try setting each of the delay times to different time settings between 30 and 70. Set the amounts and feedbacks to different values and listen to how the sound changes. Altering the values of the above parameters will "sculpt" the sound of the reverberation.

The delay time can be modulated to produce flanging and chorus effects. The main difference between the two is that flanging uses feedback and chorus does not, and chorus typically uses a longer delay time (though, with modulation, the range of delay times for each effect may actually overlap a bit).

For flanging, a Time value of 31 (4.8157 milliseconds) or less is a good place to start. Use a triangle wave LFO to modulate the delay time, being careful to keep the LFO Amount low so that it doesn't drive the delay time to zero and "flatten out" the triangle at one extreme. It will be fairly obvious when that happens.

For chorus, start with a value around 53 (17.164 milliseconds).

For ping-pong effects, use a square LFO routed to Delay Pan. The Delay Pan parameter sets the initial pan position. Both the LFO and the Delay must have Sync on, and the LFO should also have Wave Reset on, to keep everything in sync.

Low Frequency Oscillators

The Prophet 12 has four low frequency oscillators (LFOs) per voice. The LFOs can be free-running, reset by keystrokes, or synced to the arpeggiator and MIDI clock.

Press any of the four LFO buttons to choose an LFO for editing.

Press and briefly hold any of the LFO buttons to light all the LFO buttons and display a single parameter for all LFOs. Turning any of the four dedicated LFO knobs—Frequency, Amount, Shape, or Destination—will cause that parameter's value to be displayed for each of the four LFOs. Use the four soft knobs above the display to adjust the individual values. Press any of the LFO buttons to return to normal editing mode.

Frequency: 0...127—Sets the frequency of LFO modulation routed to the selected destination. See also "Sync."

Amount: 0...127—Sets the amount of LFO modulation routed to the selected destination.

Shape: Triangle, Reverse Sawtooth, Sawtooth, Square, Pulse 1, Pulse 2, Pulse 3, Random—The wave shape of the LFO.
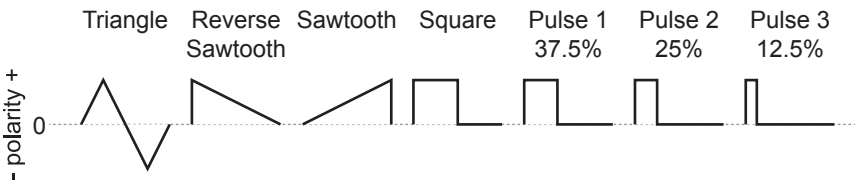
Random, also known as "sample and hold," generates a series of random values, each held for the duration of one cycle.

Triangle is bipolar. That is, it is positive for half its cycle and negative for the other half. That makes it possible to generate a natural-sounding vibrato that goes alternately sharp and flat in equal amounts on either side of a center frequency. The other wave shapes and Random generate only positive values. However, any of the LFOs can be inverted using the modulation matrix. See *Modulation* on page 32 for more information.

Destination—The parameter being modulated by the LFO. See *Modulation Destinations* on page 50 for a list of possible destinations.

Sync: Off, On—When on, Frequency displays note values that sync precisely with the arpeggiator and delay.

Displayed Value	Cycle Duration
32nd Trip	1/12 of 1 beat
32nd	1/8 of 1 beat
16th Trip	1/6 of 1 beat
16th	1/4 of 1 beat
8th Trip	1/3 of 1 beat
8th	1/2 of 1 beat
Qrtr Trip	1 1/3 beats
1 Qrtr	1 beat
Qrtr Dot	1 1/2 beats
1/2 Note	2 beats
3 Qrtr	3 beats
4 Qrtr	4 beats
6 Qrtr	6 beats
8 Qrtr	8 beats
16 Qrtr	16 beats
32 Qrtr	32 beats

Phase: 0...127—Used in conjunction with Wave Reset, Phase sets the initial phase, from 0 to 360 degrees, at which the LFO wave shape starts when keyed on. Each step represents 2.8125°, so a value of 32 equals 90°, 64 equals 180°, and so on.

> **Note:** For Phase to have any noticeable effect, Wave Reset must also be turned on for that LFO. If the LFO is free-running—that is, Wave Reset is off—there is no fixed start point from which the phase can be offset.

Slew Rate: 0...127—Slew rate is defined as the maximum possible rate of change of a signal. The effect of the Slew Rate control is most obviously heard on

Phase Offset in Degrees

0°   180°   360°
  90°   270°

0   32   64   96   127

Phase Parameter Value
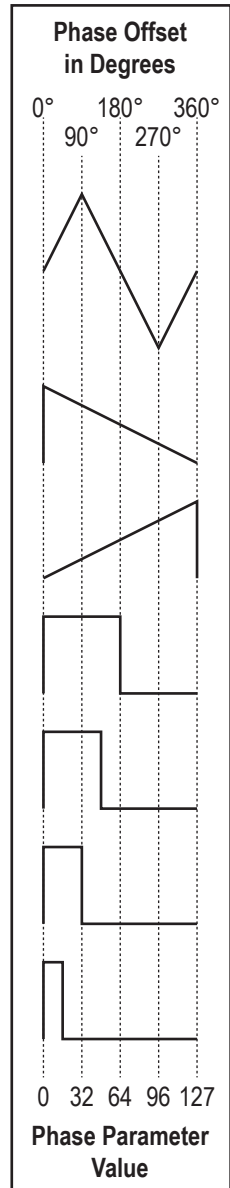
Pulse and Random, shapes that normally change state virtually instantaneously. As Slew Rate increases, those changes are drawn out, elongated, and the result is a sort of smoothing effect.

Wave Reset: Off, On—When off, the LFO is free running. When on, the LFO is re-started each time a new note is played. WAVE RESET is set independently for each LFO.

> **Note:** Use Phase to offset the start point when Wave Reset is on.

Auxiliary Envelopes

The Prophet 12 has four, five-stage envelope generators. Two of them are dedicated to the low-pass filter and VCA, but the other two can be routed to any of the modulation destinations.

> **Note:** Actually, any of the envelopes can be routed to any destination—or multiple destinations—using the modulation matrix. See *Modulation* on page 32 for more information.

See *Low-Pass Filter* on page 18 for an illustrated example of an envelope generator.

Destination—The parameter being modulated by the envelope. See *Modulation Destinations* on page 50 for a list of possible destinations.

Envelope Amount: -127...127—Sets the amount of modulation from the envelope to the chosen destination. The modulation amount can be positive or negative, allowing for inverted envelope control.

Velocity→Envelope Amount: 0...127—Enables keyboard velocity to modulate the Envelope Amount.

Delay: 0...127—Sets a delay between the time the envelope is gated on and when the Attack portion actually begins.

Attack: 0...127—Sets the attack time of the envelope.

Decay: 0...127—Sets the decay time of the envelope.

Sustain: 0...127—Sets the sustain level of the envelope.

Release: 0...127—Sets the release time of the envelope.

Repeat: Off, On—When on, the Delay, Attack, and Decay segments of the envelope repeat. Sustain still affects the level at which the Decay segment ends, but—instead of sustaining at a fixed level while a note is gated on—Delay, Attack, and Decay loop until the note is turned off. The Release segment begins when the note is gated off, just as it does when Repeat is off. For an illustrated example, see *Low-Pass Filter* on page 18.

Modulation

The Prophet 12 has eight fixed-source modulation paths and a 16 x 2 modulation matrix where the mod sources and destinations are completely user configurable. There are 27 modulation sources and 98 destinations. For complete lists of all the sources and destinations, see page 49 and page 50.

To display the mod routings, press either of the Assign Mod buttons in the Modulation section.

```
┌─────────────┬──────────┬─────────┬─────────────┐
│ Edit Mod 1  │  Source  │ Amount  │ Destination │
│ B1 P32: Heavy Dumplings                         │
│                                                 │
│ Mod 1:    Mod Wheel      ▶ 23  ▶  LFO 1 Amount  │
│ Mod 2:  Slider 1 Position ▶ 50 ▶  LPF Cutoff    │
│ Mod 3:  Slider 2 Position ▶ -50 ▶ HPF Cutoff    │
│  Sort Slot  │ Sort Source │ Sort Dest │         │
└─────────────┴─────────────┴───────────┴─────────┘
```

Soft knob 1 selects the modulation slot to edit.

Source (Soft knob 2) sets the modulation source.

Amount (Soft knob 3) sets the amount of modulation from the source to the destination. Amount can be set over a range of -127 to 127.

Destination (Soft knob 4) sets the modulation destination.

Sort Slot (Soft key 1) sorts the 24 mod slots in order.

Sort Source (Soft key 2) sorts the mod slots by Source, to more easily see how a single source may be routed to multiple destinations.

Sort Dest (Soft key 3) sorts the mod slots by Destination, to more easily see how multiple sources may be routed to a single destination.

Using the Assign Mod Buttons

The Prophet 12 provides a shortcut for modulation routing in the form of the Assign Mod Source and Assign Mod Destination buttons.

To assign modulation:

1. Press and hold Assign Mod Source.

2. Choose a source by turning its knob or pressing its button, or my using a controller (pitch wheel, mod wheel, or touch slider).

    The Modulation screen is displayed and that source is assigned to the first available mod slot. Release Assign Mod Source.

3. Press and hold Assign Mod Destination.

4. Choose a destination by turning its knob or pressing its button.

    That destination is assigned to the mod slot. Release Assign Mod Destination.

5. Use either the Amount knob or soft knob 3 to set the modulation amount.

New modulation paths can easily be assigned by repeating these steps until all of the available mod slots are used.

> **Cool Tip:** When assigning modulation destinations, hold the Destination button down while repeatedly pressing the parameter selection button to quickly scroll through the list of available options. For example, if you wanted to assign Osc 1 FM as a destination, press and hold Assign Mod Destination and repeatedly press the Osc 1 button until the mod destination in the OLED displays Osc 1 FM.

Distortion

The Prophet 12's stereo analog distortion is actually two stereo distortions, one for layer A and another for layer B, so that split and stacked sounds can have different distortion settings per layer.

Distortion: 0…127—Sets the distortion amount for the current layer.

Unison

When UNISON is on, the Prophet 12 plays like a monophonic synthesizer. That is, only one note can be played at a time. Turn UNISON on to display the three parameters that control how the voices and keyboard will respond.

> **Note:** UNISON can be on in Layer A and off in Layer B, or vice versa.

```
┌──────────┬──────────┬────────────┬───────────┐
│   Mode   │  Detune  │ Key Assign │           │
│ B1 P1: Super Squirrel                         │
│                                               │
│ ┌─────────┐    ⊙ 0   ┌──────────┐             │
│ │1 Voice  │          │Low Note  │             │
│ MODE         DETUNE   KEY ASSIGN              │
│ ┌──────────┬──────────┬──────────┬──────────┐ │
│ │  Unison  │ Keyboard │          │          │ │
└──────────┴──────────┴──────────┴──────────────┘
```
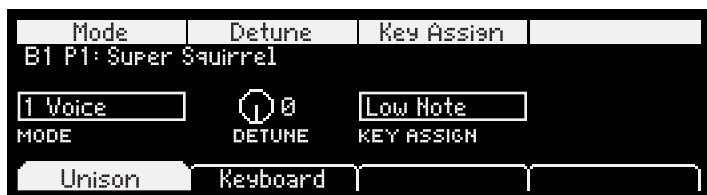
Mode: 1 Voice, All Voices—Set to 1 Voice, only one of the twelve voices plays. Use this setting to emulate a typical monophonic synthesizer. When set to All Voices, all the available voices play in unison (all twelve voices or six if Stack or Split are on).

Detune: 0…127—In All Voices mode, Detune detunes the voices by varying amounts to fatten the sound.

Key Assign: Low Note, LowRetrig, HighNote, HighRetrig, LastNote, LastRetrig — Key Assign (sometimes called note priority) determines what note gets priority when more than one note is played via MIDI. Low-note priority is most common in vintage synths and is often used for playing trills by holding a note and repeatedly tapping a lower note. LowRetrig causes the envelopes to be retriggered with each keystroke. HighNote and HighRetrig are similar to the low note settings, except that the highest note is given priority. And LastNote and LastRetrig give priority to the last note played.

Glide

Glide or *portamento* is a feature that has been present on synthesizers since at least the early '70s. (Earlier modular synthesizers could achieve the same effect through the use of a *lag processor*.) In monophonic synthesizers (or the Prophet 12 when Unison is on), it simply causes the pitch of a note to glide up or down from the pitch of the previously played note. When played polyphonically, the Prophet 12 behaves in a similar fashion, except the pitch glides up or down from the previous note *played on that voice*. For example, say C3 is played on voice 1 with Glide on. More notes are played and cycle through voices 2 through 12. The next time voice 1 sounds, it's playing F#4. The pitch will glide up from C3 to F#4.

Glide is turned on and off using the Glide switch, but the Glide Amount must also be set in the Oscillators section. If Glide is on, but Glide Amount is set to 0 for all oscillators, Glide has no apparent effect. Glide Amount can be set to a different value for each of the oscillators.

> **Tip:** To set Glide Amount for all oscillators simultaneously, press and briefly hold any of the oscillator select buttons until all of them are lit. Repeatedly press Prev and Next Param (Soft keys 2 & 3) until Glide is displayed. Press and hold, Hold: Edit All (Soft key 1) while adjusting one of the soft knobs. Press any oscillator button to exit.

In addition to Glide Amount, there are four Glide modes—FixRate, FixRate A, FixTime, and FixTime A—that determine how Glide behaves. Turn Glide on to display and change the modes.

FixRate: The time to transition between notes varies with the interval between the notes; the greater the interval, the longer the transition time. The glide rate is fixed.

FixRate A: The same as FixRate, but glide is only applied when playing legato. That is, glide only occurs when a note is held until the next note is played. This effectively allows glide to be turned on and off from the keyboard.

FixTime: Glide is set to a fixed time, regardless of the interval between notes.

FixTime A: The same as FixTime, but glide only occurs when playing legato.

Hold

When HOLD is on, any played notes will continue to play until HOLD is turned off. If more than twelve notes are played, voices will be stolen from the earlier held notes in order to play the new notes.

When used in conjunction with the arpeggiator's Arp Auto Latch function, arpeggiated notes are latched on and replaced by any new note(s) struck.

Arpeggiator

The Prophet 12 has a flexible and full-featured arpeggiator that can be synced to the LFOs, delay, and external MIDI clock. Particularly complex arpeggios can be created using split and stack with different arpeggiator settings for layers A and B.

```
┌──────────────┬──────────────┬──────────────┬──────────────┐
│  Arp Mode    │ Octave Range │ Clock Divide │   Repeats    │
│ B1 P1: Super Squirrel                                      │
│                                                            │
│ ┌──────────┐   ┌──────────┐   ┌──────────┐    ┌────────┐   │
│ │ Up+Down  │   │ 1 Octave │   │   1/16   │    │   0    │   │
│ └──────────┘   └──────────┘   └──────────┘    └────────┘   │
│   ARP MODE     OCTAVE RANGE   CLOCK DIVIDE     REPEATS     │
│ ┌──────────┐  ┌──────────┐                 ┌───────────┐   │
│ │ Arp Main │  │ Arp Misc │                 │Capture Arp│   │
│ └──────────┘  └──────────┘                 └───────────┘   │
└────────────────────────────────────────────────────────────┘
```
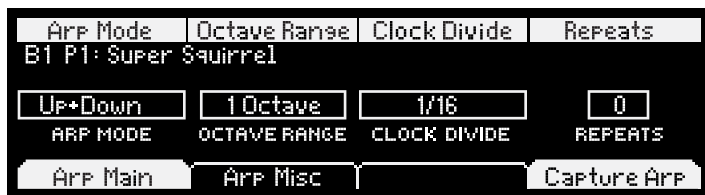
Arpeggiator—Turns the Arpeggiator on and off.

Arp Mode: See table—Sets the order in which notes play when Arpeggiator is on.

Arp Mode	Behavior
Up	Plays from lowest to highest note
Down	Plays from highest to lowest note
Up + Down	Plays from lowest to highest and back to lowest
Assign	Plays notes in the order the keys were pressed
Random	Plays notes randomly

Octave Range: 1 Octave, 2 Octaves, 3 Octaves—Set to 1 Octave, only the keyed notes are arpeggiated. Set to 2 Octaves, the keyed notes and the notes one octave above them arpeggiate. Set to 3 Octaves, the keyed notes and the notes one and two octaves above them arpeggiate.

Repeats: 0…3—Set to 0, each note in the arpeggio plays once. Set to 1, each note in the arpeggio plays once and then repeats once, which is a long way of saying each step plays twice. The maximum number of repeats is 3 (each step plays four times).

Tap Tempo—Tap the switch to set the tempo from 30 to 250 BPM.

Clock Divide: See table—Sets the note value for each arpeggiator step relative to the BPM. CLOCK DIVIDE works with both internal and external clock sources. The following table lists the CLOCK DIVIDE values.

Display	Tempo	Timing Division
1/2	BPM/2	Half note
1/4	BPM	Quarter note
1/8	BPM x 2	Eighth note
1/8 Half Swing	BPM x 2	Eighth note, half swing timing
1/8 Full Swing	BPM x 2	Eighth note, full swing timing
1/8 Triplet	BPM x 3	Eighth note triplets
1/16	BPM x 4	Sixteenth note
1/16 Half Swing	BPM x 4	Sixteenth note, half swing timing
1/16 Full Swing	BPM x 4	Sixteenth note, full swing timing
1/16 Triplet	BPM x 6	Sixteenth note triplets
1/32	BPM x 8	Thirty-second note

BPM: 30…250—Sets the tempo for the arpeggiator in BPM (beats per minute). Tap Tempo flashes on the beat. Also affects the LFO frequency and delay time when Sync is turned on for an LFO or delay tap. When syncing to an external MIDI clock source, the BPM control has no effect.

Arp Auto Latch: Off, On—Works in conjunction with HOLD. When HOLD and ARPEGGIATOR are on and Arp Auto Latch is off, played notes are held on and arpeggiated, with additional played notes added to the held notes and the arpeggio.

When Arp Auto Latch and HOLD are both on, played notes are latched on. Removing your hands from all keys and then playing an additional note or notes causes the held notes to be released and the newly played note(s) to be latched on. As long as at least one key is held, pressing additional keys will add to the arpeggio.

Lock Notes: Off, On—With the arpeggiator ON, play and hold notes. Turning LOCK NOTES On while notes are held will take a temporary snapshot of your arpeggio and save it to the arpeggiator scratchpad. The arpeggiated pattern can now be transposed to any note on your keyboard simply by playing a single note.

> **Note:** Lock Notes can be used in conjunction with the Hold button for arpeggiator transposition with continuous arpeggiator playback.

You can edit the arpeggio temporarily saved to the scratchpad.
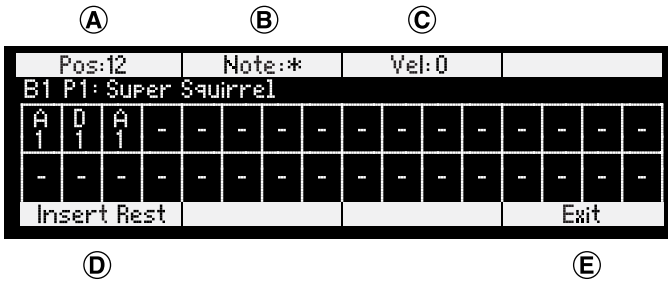
To get to the Arpeggiator Scratchpad:

1. Press the ARP MISC tab

2. Set LOCK NOTES to On.

3. When LOCK NOTES is On, Soft key #4 becomes a button called EDIT ARP. Press EDIT ARP to access the arpeggiator snapshot.

The arp edit screen displays the arpeggiator snapshot. From this screen it is possible to change note values, insert new notes, insert rests, delete notes, and change note velocities. The arpeggiator holds a maximum of 32 notes.

A. Position (soft knob 1): Changes current cursor edit position

B. Note (soft knob 2): Changes current note value

C. Velocity (soft knob 3): Changes current note velocity

D. Insert/Delete Rest (soft button 1): Insert or Delete rest

E. Exit Scratchpad (soft button 4): Exits arp edit screen

You can also save notes to the arpeggiator scratchpad if Lock Notes is OFF. To do so, when MIDI notes are held and you are looking at either the Arp Main, or Arp Misc screens, soft key #4 becomes a button called CAPTURE ARP. The CAPTURE ARP text is only present when MIDI notes are held. When CAPTURE ARP is pressed, the note combination is temporarily saved to the arpeggiator scratchpad.

> **Note:** You can save an arpeggio in program memory. However, you must save the program by pressing the Write button in order to save the arpeggio, it is not saved automatically.

Master Volume/Voice Volume

Volume of a program is determined by a combination of the Master Volume, Voice Volume, and Pedal/MIDI volume (if used). If any of the three are off, there will be no output.

Voice Volume is set in the Vol/Dist tab of the VCA screens. Voice Volume is programmable to balance the level between programs.

> **Note:** The volume settings in the Layers screen are Voice Volume. See *Layers, Split, and Stack* on page 44 for more information.

Pitch and Modulation Wheels

The range of your controller keyboard's pitch wheel can be programmed for each preset. The up and down range can be set separately.

To set the pitch bend range:

1. Press the GLIDE button.

   The Wheel/Glide screen is displayed.
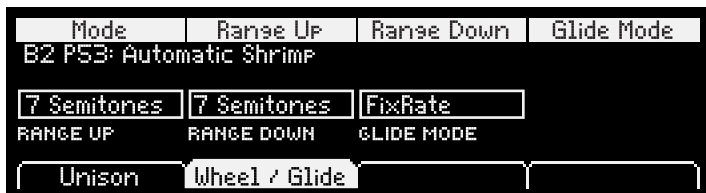
2. Use Range Up (soft knob 2) to set the pitch bend up range.

   Range Up can be set in semitones from Off to 1 Octave.

3. Use Range Down (soft knob 3) to set the pitch bend down range.

   Range Down can be set in semitones from Off to 2 Octaves.

Mod Wheel

Your controller's mod wheel is a modulation source and can be assigned to a modulation destination just like any other mod source, either using the modulation matrix or the ASSIGN MOD buttons. See *Modulation* on page 32 for more information.

Layers, Split, and Stack

Each of the Prophet 12's programs contains two layers, layer A and layer B. Each layer can contain a complete, distinctly different sound from the other layer. In a sense, each program is really two programs. This helps to facilitate split and stacked (layered) key mapping.

When a program is recalled from memory and neither Split A | B nor Stack A + B are on, the sound that is loaded is the sound in layer A. To play and edit layer B, turn on Edit Layer B.

> **Tip:** To edit parameters in layers A and B simultaneously, press and briefly hold Edit Layer B until it blinks. To return to single layer editing, press Edit Layer B again.

When Split A | B is on, layer A is mapped to the left of the keyboard's split point and layer B is mapped to the right. Layer A plays up to—but does not include—the split point; layer B plays from the split point and above. Six voices are allocated to each side of the split.

To set the split point:

1. Turn Split A | B on.

2. Press and hold the key where layer B should start.

3. Press Split A | B.

    The Split Point is set to that note.

When Stack A + B is on, both layers play for the full range of the keyboard, with six voices allocated to each layer.

Managing Layers

Layers can easily be swapped or copied between programs to create useful split and stacked programs.

To display the layers screen:

• Press Edit Layer B

Ⓐ   Ⓑ   Ⓒ   Ⓓ

```
┌─────────────┬──────────────┬──────────────┬──────────────┐
│ Prog / Layer│     Bank     │   Layer Vol  │  Split Point │
├─────────────┴──────────────┴──────────────┴──────────────┤
│ A: P 44A U4: Secret Squirrel      127                     │
│                                              ┌──────┐     │
│ B: P 23B F2: Fearless Fly         115        │  C5  │     │
│                                              └──────┘     │
│                                              SPLIT POINT  │
├─────────────┬──────────────┬──────────────┬──────────────┤
│  Copy A -> B │  Copy B -> A │  Swap A <-> B │    Load A   │
└─────────────┴──────────────┴──────────────┴──────────────┘
```

Ⓕ   Ⓖ   Ⓗ   Ⓘ
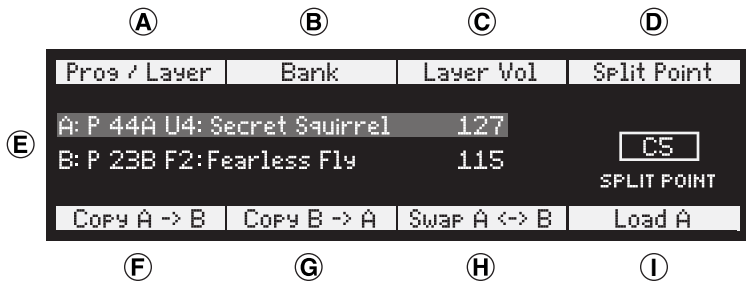
A. **Program/Layer** (soft knob 1): Choose any program and layer (A or B) in the current bank.

  To Audition a Layer:

1. After pressing EDIT LAYER B, use Soft Key 4 (Load A/B) to switch between A and B layers to edit.

2. Adjust the Program, Bank or Volume for the selected layer in either split or stack modes. Discover endless tonal and textural possibilities.

C. **Bank** (soft knob 2): Choose a bank (User = U1, U2, U3, or U4; Factory = F1, F2, F3, or F4).

D. **Layer Vol** (soft knob 3): Sets the program volume for the selected layer.

E. **Split Point** (soft knob 4): Sets the split point for the current program.

F. **The current layers and their names.**

G. **Copy A -> B** (soft key 1): Copies the sound and name from layer A to layer B.

H. **Copy B -> A** (soft key 2): Copies the sound and name from layer B to layer A.

I. **Swap A <-> B** (soft key 3): Swaps the sound and name from layer A to B and B to A.

J. **Load A/B** (soft key 4): Selects the layer, A or B.

Important: These operations manage the sounds loaded into the current program's A and B layers, but the program must still be written to memory in order to retain those settings.

Multi Mode Operation

When Multi Mode is On, the Prophet 12 can be controlled by two separate MIDI channels. In Multi Mode, Layer A will only play voices 1-6 and Layer B will only play voices 7-12.

To Turn Multi Mode On:

1. Press GLOBAL.

2. Scroll down to 4. MIDI Multi Mode and turn it On. Note that the parameter 3. MIDI Channel changes to show the channels for the A and B layers.

3. Press GLOBAL again to exit the Global menu.

*   **For all Multi Modes Normal (stack/split OFF)/Split/Stack**:
    The front panel controls will send MIDI data on Layer A's MIDI channel.

*   **Press the Edit Layer B button to activate Layer B.**
    The front panel controls will now send MIDI data on Layer B's MIDI channel.

*   **Press and hold the Edit Layer B button to enter Link Edit Mode.**
    The front panel controls send MIDI data on both channels simultaneously.

*   **If Split A|B is active,** the split point determines the MIDI note channel assignment for Layer A and Layer B.

*   **If Stack A + B is active,** MIDI data from the front panel controls is sent on Layer A's MIDI channel by default. Press Edit Layer B to send MIDI data on Layer B's channel.

Sending a program change message to either Layer A or Layer B's MIDI channel will load Layer A only of that program. To load Layer B of a given program to either Layer A or Layer B, use MIDI CC 66 on each layer's corresponding MIDI channel.

> **Note:** If the MIDI channel is set to ALL, Layer B's MIDI channel will be set to OFF. Choose a single MIDI channel to activate Layer B's MIDI channel.

Using USB

The Prophet 12's USB 2.0 port enables bidirectional MIDI communication with a computer. A MIDI interface and MIDI cables are not necessary, just a USB cable. The Prophet 12 is a Class Compliant USB device. That means it does not require any additional drivers to be installed to communicate with a Mac or Windows computer.

The Prophet 12 transmits and receives MIDI data via USB, but does not transmit audio.

> **Note:** MIDI In and USB should not be used at the same time, as overlapping messages from different sources may cause the Prophet 12 to respond unpredictably. MIDI Out and USB can be used at the same time and transmit the same data.

USB Notes

Under Mac OS X, "Prophet 12 Keyboard" will appear as a MIDI port when connected via USB and can be configured using the Mac's Audio MIDI Setup utility (typically found in Applications/Utilities).

Under Windows, the first time the Prophet 12 is connected via USB, the "Found new hardware" alert appears and it is automatically installed as "Prophet 12 Keyboard."

In Windows, if you unplug the USB cable and plug it back in while a program has the Prophet 12 port open, you may have to resync. That usually means going to the Prophet 12 Properties—in the Windows Device Manager under "Sound, video, and game controllers"—and clicking OK. If Prophet 12 is no longer listed in the Device Manager, power the Prophet 12 down and back up again while it is connected via USB. It should be detected on power up.

Appendix A: Modulation Sources

Off
Osc 1
Osc 2
Osc 3
Osc 4
LFO 1
LFO 2
LFO 3
LFO 4
Lowpass Env
VCA Env
Env 3
Env 4
Pitchbend
Mod Wheel
Slider 1 Position
Slider 2 Position
Slider 1 Pressure
Slider 2 Pressure
Aftertouch
CC#2: Breath
CC#4: Foot Pedal
CC#11: Expression
Velocity
Note Number
Random
DC
Audio Out

Appendix B: Modulation Destinations

Off	LPF Cutoff
Osc 1 Freq	LPF Resonance
Osc 2 Freq	HPF Cutoff
Osc 3 Freq	HPF Resonance
Osc 4 Freq	VCA
Osc All Freq	Pan
Osc 1 Level	Pan Spread
Osc 2 Level	Feedback Amount
Osc 3 Level	Feedback Tuning
Osc 4 Level	Delay 1 Amount
Osc 1 Shape Mod	Delay 2 Amount
Osc 2 Shape Mod	Delay 3 Amount
Osc 3 Shape Mod	Delay 4 Amount
Osc 4 Shape Mod	Delay 1 Time
Sub Osc Level	Delay 2 Time
Osc 1 FM	Delay 3 Time
Osc 2 FM	Delay 4 Time
Osc 3 FM	Delay 1 Feedback
Osc 4 FM	Delay 2 Feedback
Osc All FM	Delay 3 Feedback
Osc 1 AM	Delay 4 Feedback
Osc 2 AM	Delay 1 Pan
Osc 3 AM	Delay 2 Pan
Osc 4 AM	Delay 3 Pan
Osc All AM	Delay 4 Pan
Osc All Slop	LFO 1 Freq
Air	LFO 2 Freq
Girth	LFO 3 Freq
Hack	LFO 4 Freq
Decimate	LFO 1 Amount
Drive	LFO 2 Amount

LFO 3 Amount	Mod 14 Amount
LFO 4 Amount	Mod 15 Amount
LPF Env Amount	Mod 16 Amount
Amp Env Amount	
Env 3 Amount	
Env 4 Amount	
LPF Env Attack	
Amp Env Attack	
Env 3 Attack	
Env 4 Attack	
All Env Attack	
LPF Env Decay	
Amp Env Decay	
Env 3 Decay	
Env 4 Decay	
All Env Decay	
LPF Env Release	
Amp Env Release	
Env 3 Release	
Env 4 Release	
All Env Release	
Mod 1 Amount	
Mod 2 Amount	
Mod 3 Amount	
Mod 4 Amount	
Mod 5 Amount	
Mod 6 Amount	
Mod 7 Amount	
Mod 8 Amount	
Mod 9 Amount	
Mod 10 Amount	
Mod 11 Amount	
Mod 12 Amount	
Mod 13 Amount	

Appendix C: Delay Times

Value	Time (msec)	Value	Time (msec)	Value	Time (msec)
0	0.9556	30	5.4055	60	30.5781
1	1.0124	31	5.7269	61	32.3963
2	1.0726	32	6.0675	62	34.3227
3	1.1364	33	6.4282	63	36.3636
4	1.2039	34	6.8105	64	38.5259
5	1.2755	35	7.2155	65	40.8168
6	1.3514	36	7.6445	66	43.2439
7	1.4317	37	8.0991	67	45.8153
8	1.5169	38	8.5807	68	48.5396
9	1.6071	39	9.0909	69	51.4259
10	1.7026	40	9.6315	70	54.4839
11	1.8039	41	10.2042	71	57.7237
12	1.9111	42	10.8110	72	61.1561
13	2.0248	43	11.4538	73	64.7926
14	2.1452	44	12.1349	74	68.6454
15	2.2727	45	12.8565	75	72.7273
16	2.4079	46	13.6210	76	77.0519
17	2.5511	47	14.4309	77	81.6336
18	2.7027	48	15.2890	78	86.4878
19	2.8635	49	16.1982	79	91.6306
20	3.0337	50	17.1614	80	97.0793
21	3.2141	51	18.1818	81	102.8519
22	3.4052	52	19.2630	82	108.9678
23	3.6077	53	20.4084	83	115.4474
24	3.8223	54	21.6219	84	122.3122
25	4.0495	55	22.9077	85	124.7166
26	4.2903	56	24.2698	86	129.8653
27	4.5455	57	25.7130	87	135.0140
28	4.8157	58	27.2419	88	140.1627
29	5.1021	59	28.8618	89	145.3115

Value	Time (msec)	Value	Time (msec)	Value	Time (msec)
90	150.4602	122	315.2194	154	479.9787
91	155.6089	123	320.3681	155	485.1274
92	160.7576	124	325.5169	156	490.2761
93	165.9064	125	330.6656	157	495.4248
94	171.0551	126	335.8143	158	500.5736
95	176.2038	127	340.9631	159	505.7223
96	181.3525	128	346.1118	160	510.8710
97	186.5013	129	351.2605	161	516.0197
98	191.6500	130	356.4092	162	521.1685
99	196.7987	131	361.5580	163	526.3172
100	201.9474	132	366.7067	164	531.4659
101	207.0962	133	371.8554	165	536.6146
102	212.2449	134	377.0041	166	541.7634
103	217.3936	135	382.1529	167	546.9121
104	222.5424	136	387.3016	168	552.0608
105	227.6911	137	392.4503	169	557.2096
106	232.8398	138	397.5990	170	562.3583
107	237.9885	139	402.7478	171	567.5070
108	243.1373	140	407.8965	172	572.6557
109	248.2860	141	413.0452	173	577.8045
110	253.4347	142	418.1939	174	582.9532
111	258.5834	143	423.3427	175	588.1019
112	263.7322	144	428.4914	176	593.2506
113	268.8809	145	433.6401	177	598.3994
114	274.0296	146	438.7888	178	603.5481
115	279.1783	147	443.9376	179	608.6968
116	284.3271	148	449.0863	180	613.8455
117	289.4758	149	454.2350	181	618.9943
118	294.6245	150	459.3838	182	624.1430
119	299.7732	151	464.5325	183	629.2917
120	304.9220	152	469.6812	184	634.4404
121	310.0707	153	474.8299	185	639.5892

Value	Time (msec)	Value	Time (msec)	Value	Time (msec)
186	644.7379	218	809.4971	250	974.2564
187	649.8866	219	814.6459	251	979.4051
188	655.0353	220	819.7946	252	984.5538
189	660.1841	221	824.9433	253	989.7025
190	665.3328	222	830.0920	254	994.8513
191	670.4815	223	835.2408	255	1000.0000
192	675.6303	224	840.3895		
193	680.7790	225	845.5382		
194	685.9277	226	850.6869		
195	691.0764	227	855.8357		
196	696.2252	228	860.9844		
197	701.3739	229	866.1331		
198	706.5226	230	871.2818		
199	711.6713	231	876.4306		
200	716.8201	232	881.5793		
201	721.9688	233	886.7280		
202	727.1175	234	891.8768		
203	732.2662	235	897.0255		
204	737.4150	236	902.1742		
205	742.5637	237	907.3229		
206	747.7124	238	912.4717		
207	752.8611	239	917.6204		
208	758.0099	240	922.7691		
209	763.1586	241	927.9178		
210	768.3073	242	933.0666		
211	773.4560	243	938.2153		
212	778.6048	244	943.3640		
213	783.7535	245	948.5127		
214	788.9022	246	953.6615		
215	794.0510	247	958.8102		
216	799.1997	248	963.9589		
217	804.3484	249	969.1076		

MIDI Implementation

Prophet 12 receives MIDI data according to the mode controls under Gʟᴏʙᴀʟ. In addition, there is interaction between some of the Program parameters that determine the overall response of Prophet 12 to MIDI data.

Following are the Global parameters that affect response to MIDI:

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

MIDI Clock Mode: See table — Selects the MIDI clock status as follows:

Display	MIDI Clock Setting
Off	MIDI clock is neither sent nor received
Master	MIDI clock is sent, but not received
Slave	MIDI clock is received, but not sent
Slave Thru	MIDI clock is received and passed to MIDI Out

MIDI Clock Cable: MIDI Port, USB—Selects the MIDI port by which MIDI clock data is transmitted and received.

MIDI Parameter Send: NRPN, CC, Off—Changes to the values of Prophet 12's front panel controls are transmitted via MIDI as Non-registered Parameter Number (NRPN) controllers or as Continuous Controllers (CC). Transmission of parameters can also be turned off.

MIDI Parameter Receive: All, NRPN, CC, Off—Sets the method by which Prophet 12 receives parameter changes via MIDI. As with transmission, NRPNs are the preferred method, though some controllers may only be able to send CCs.

MIDI Control Enable: Off, On—When On, the synth will respond to MIDI control messages, including Pitch Wheel, Mod Wheel, Pedal, Breath, Volume, and Expression.

MIDI SysEx Enable: Off, On—When On, the synth will respond to received MIDI SysEx messages, and will transmit them, when prompted, to the MIDI Out.

MIDI Out Select: Off, MIDI, USB, MIDI+USB—Selects the output to use for MIDI transmissions.

MIDI Messages

System Real-Time Messages

Status	Description
1111 1000	MIDI Timing Clock

Received Channel Messages

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

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

Received Controller Messages

Status	Second	Third	Description
1011 nnnn	1	0vvvvvvv	Mod Wheel: directly assignable controller
1011 nnnn	2	0vvvvvvv	Breath Controller: directly assignable controller
1011 nnnn	4	0vvvvvvv	Foot Controller: directly assignable controller
1011 nnnn	7	0vvvvvvv	Volume: Combined with Master Volume and Voice Volume
1011 nnnn	74	0vvvvvvv	Brightness: Added to low-pass filter cutoff frequency
1011 nnnn	11	0vvvvvvv	Expression Controller: directly assignable controller

Status	Second	Third	Description
1011 nnnn	32	0vvvvvvv	Bank Select: 0 - 3 select user banks 1 - 4; 4 - 7 select factory banks 1 - 4; others ignored
1011 nnnn	64	0vvvvvvv	Damper pedal: Holds envelopes in Sustain if 0100 0000 or higher
1011 nnnn	123	0vvvvvvv	All Notes Off: Clear all MIDI notes
1011 nnnn	121	0vvvvvvv	Reset All Controllers: Clears all MIDI controllers to 0, MIDI volume to maximum

See sections below for additional Continuous Controller (CC) and Non-registered Parameter Number (NRPN) messages received.

Transmitted Channel Messages

Status	Second	Third	Description
1000 nnnn	0kkkkkkk	0000000	Note Off.
1001 nnnn	0kkkkkkk	0vvvvvvv	Note On.
1011 nnnn	0vvvvvvv	0vvvvvvv	Control Change; see "Transmitted Controller Messages"
1100 nnnn	0ppppppp		Program change, 0-98 for Programs 1-99 within current Bank
1101 nnnn	0vvvvvvv		Channel Pressure
1110 nnnn	0vvvvvvv	0vvvvvvv	Pitch Bend LS Byte then MS Byte

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

Transmitted Controller Messages

Status	Second	Third	Description
1011 nnnn	0000 0001	0vvvvvvv	Mod Wheel
1011 nnnn	0000 0010	0vvvvvvv	Breath Controller: When assigned to Pedal 1 or Pedal 2
1011 nnnn	0000 0100	0vvvvvvv	Foot Controller: When assigned to Pedal 1 or Pedal 2
1011 nnnn	0000 0111	0vvvvvvv	Volume: When assigned to Pedal 1 or Pedal 2

1011 nnnn	0100 1010	0vvvvvvv	Brightness: When assigned to Pedal 1 or Pedal 2
1011 nnnn	0000 1101	0vvvvvvv	Expression: When assigned to Pedal 1 or Pedal 2
1011 nnnn	0010 0000	0vvvvvvv	Bank Select: 0 - 7
1011 nnnn	0100 0000	0vvvvvvv	Damper pedal: Sends 0 if off, 0111 1111 when on
1011 nnnn	0000 0111	0vvvvvvv	Volume knob

See sections below for additional Continuous Controller (CC) and Non-registered Parameter Number (NRPN) messages transmitted.

Additional Continuous Controllers Transmitted/Received

The following table details how MIDI Continuouse Controllers (CCs) are mapped onto Prophet 12's controls. They are transmitted when MIDI Param Send is set to CC in Global, and recognized when received when MIDI Param Receive is set to CC in the Global menu.

CC#	Param
1	Mod Wheel
2	Breath
3	BPM
4	Foot Controller
5	Glide Mode
6	Data Entry MSB
7	Volume
8	Osc 1 Sub Octave
9	Distortion Amount
10	Pan Spread
11	Expression
12	Voice Volume
13	A/B Mode
14	Slider 1 Position
15	Slider 2 Position
16	Slider 1 Pressure
17	Slider 2 Pressure

CC#	Param
18	Delay 1 Time
19	Delay 1 Sync
20	Delay 1 Amount
21	Delay 1 Feedback
23	Delay 2 Time
24	Delay 2 Sync
25	Delay 2 Amount
26	Delay 2 Feedback
28	Delay 3 Time
29	Delay 3 Sync
30	Delay 3 Amount
31	Delay 3 Feedback
32	Bank Select
33	Delay 4 Time
34	Delay 4 Sync
35	Delay 4 Amount
36	Delay 4 Feedback

CC#	Param
38	Data Entry LSB
40	VCA Envelope Amt
41	Velocity to VCA Env Amt
42	VCA Env Delay
43	VCA Env Attack
44	VCA Env Decay
45	VCA Env Sustain
46	VCA Env Release
47	LPF Envelope Amt
48	Velocity to LPF Env Amt
49	LPF Env Delay
50	LPF Env Attack
51	LPF Env Decay
52	LPF Env Sustain
53	LPF Env Release
54	Osc 1 Glide Amt
55	Osc 2 Glide Amt
56	Osc 3 Glide Amt
57	Osc 4 Glide Amt
58	Arpeggiator On/Off
59	Arpeggiator Mode
60	Arpeggiaor Range
61	Arp Auto Latch On/Off
62	Arp Clock Divide
63	Arp Repeats
64	Pedal 2
65	Glide On/Off
67	Osc 1 Pitch
68	Osc 1 Fine Tune
69	Osc 1 Level
70	Osc 1 Shape
71	Osc 1 Shape Mod
72	Osc 1 FM
73	Osc 1 AM

CC#	Param
74	Brightness
75	Osc 2 Pitch
76	Osc 2 Fine Tune
77	Osc 2 Level
78	Osc 2 Shape
79	Osc 2 Shape Mod
80	Osc 2 FM
81	Osc 2 AM
82	Osc 3 Pitch
83	Osc 3 Fine Tune
84	Osc 3 Level
85	Osc 3 Shape
86	Osc 3 Shape Mod
87	Osc 3 FM
88	Osc 3 AM
89	Osc 4 Pitch
90	Osc 4 Fine Tune
91	Osc 4 Level
92	Osc 4 Shape
93	Osc 4 Shape Mod
94	Osc 4 FM
95	Osc 4 AM
96	Data Inc
97	Data Dec
98	NRPN LSB
99	NRPN MSB
100	RPN LSB
101	RPN MSB
102	LPF Frequency
103	LPF Resonance
104	LPF Key Amount
105	LPF 2/4 Pole
106	HPF Frequency
107	HPF Resonance

CC#	Param
108	HPF Key Amount
109	Girth
110	Air
111	Hack
112	Decimate
113	Drive
114	Feedback Amount
115	Feedback Tuning
116	Unison On/Off
117	Unison Detune
118	Unison Mode
119	Unison Key Assign

NRPN Messages

The Non-Registered Parameter Number (NRPN) MIDI messages are used to transmit and receive both global and program parameters. They are transmitted when MIDI Parameter Send is set to NRPN in Global, and received when MIDI Parameter Receive is set to NRPN in Global.

The messages are handled in standard MIDI format using the NRPN CC commands in running status byte format. Below is the format used for transmitting a NRPN parameter.

Transmitted NRPN Messages

Status	Description
1011 nnnn	Control Change
0110 0011	NRPN parameter number MSB CC
0vvv vvvv	Parameter Number MSB
0110 0010	NRPN parameter number LSB CC
0vvv vvvv	Parameter Number LSB
0000 0110	NRPN parameter value MSB CC
0vvv vvvv	Parameter value MSB
0010 0110	NRPN parameter value LSB CC
0vvv vvvv	Parameter value LSB

The parameter number can be found in the two tables below, one for Global parameters, and the other for Program parameters. The parameter numbers and the parameter values are broken into two 7-bit bytes for MIDI transmission; the LSB has the seven least-significant bits, and the MSB has the seven most-significant bits, though in most cases the MSB will be zero or one, and never more than two.

When receiving a NRPN, all messages do not necessarily need to be transmitted, since the synth will track the most recent NRPN number, though it is usually good practice to send the entire message above.

Once a NRPN is selected, the synth will also respond to NRPN Data Increment and Decrement commands, which some controllers utilize. Finally, it responds to one RPN (Registered Parameter Number) command, the RPN/NRPN Reset command, which can be handy for resetting the currently selected parameter to a known state.

Received NRPN Messages

Status	Second	Third	
1011 nnnn	0110 0011	0vvvvvvv	NRPN parameter number MSB CC
1011 nnnn	0110 0010	0vvvvvvv	NRPN parameter number LSB CC
1011 nnnn	0000 0110	0vvvvvvv	NRPN parameter value MSB CC
1011 nnnn	0010 0110	0vvvvvvv	NRPN parameter value LSB CC
1011 nnnn	0110 0000	0xxxxxxx	NRPN parameter value Increment
1011 nnnn	0110 0001	0xxxxxxx	NRPN parameter value Decrement
1011 nnnn	0010 0101	0111111	RPN parameter number MSB CC - Reset NRPN parameter number (when both MSB and LSB received)
1011 nnnn	0010 0100	0111111	RPN parameter number LSB CC - Reset NRPN parameter number (when both MSB and LSB received)

Global Parameter Data

The following table shows the Global data that is sent and received on global parameter dumps, and the corresponding NRPN number when sent/received individually.

NRPN	Range	Description
1024	0-24	Master Coarse Tune
1025	0-100	Master Fine Tune
1026	0-16	MIDI Channel 0 = All
1027	0-3	MIDI Clock Mode 0 = Off 1 = Master 2 = Slave 3 = Slave Thru
1028	0-1	MIDI Clock Cable 0 = MIDI Port 1 = USB
1029	0-2	MIDI Param Send* 0 = NRPN 1 = CC 2= Off

NRPN	Range	Description
1030	0-2	MIDI Param Receive† 0 = NRPN 1 = CC 2= Off
1031	0-1	MIDI Control Enable 0 = Off 1 = On
1032	0-1	MIDI SysEx Enable 0 = Off 1 = On
1033	0-2	MIDI SysEx Cable 0 = None 1= MIDI Port 2 = USB
1034	0-3	MIDI Out Select 0 = Off 1 = MIDI 2 = USB 3 = MIDI+USB
1035	0-1	Local Control* 0 = Off 1 = On
1036	0-1	Mono/Stereo 0 = Stereo 1 = Mono
1037	0-2	Pot Mode 0 = Relative 1= PassThru 2 = Jump
1038	0-1	Sustain Footswitch 0 = normally open 1= normally closed
1039	0-1	Sustain Pedal Function 0 = sustain 1 = arpeggiator on/off
1040	0-5	Pedal 1 Function
1041	0-5	Pedal 2 Function
1042	0-1	Aftertouch Enable 0 = Off 1 = On

NRPN	Range	Description
1043	0-3	Aftertouch Curve
1044	0-3	Velocity Curve

*Controller received, but not transmitted.

†Controller transmitted, but ignored when received.

Program Parameter Data

The following table lists Prophet 12's program parameters.

NRPN Layer A	NRPN Layer B	Value	Description
0	512	0-120	Osc 1 Pitch
1	513	0-100	Osc 1 Fine Tune
2	514	0-127	Osc 1 Level
3	515	0-19	Osc 1 Shape 0 = Off 1 = Sawtooth 2 = Pulse 3 = Triangle 4 = Sine 5 = Tines 6 = Mellow 7 = Church 8 = Muted 9 = Nasal 10 = Boing 11 = Gothic 12 = Ahhh 13 = Shrill 14 = Ohhhh 15 = Buzzzz 16 = Meh 17 = Red Noise 18 = White Noise 19 = Violet Noise
4	516	0-127	Osc 1 Shape Mod

NRPN Layer A	NRPN Layer B	Value	Description
5	517	0-11	Osc 1 Wave Left 0 = Tines 1 = Mellow 2 = Church 3 = Muted 4 = Nasal 5 = Boing 6 = Gothic 7 = Ahhh 8 = Shrill 9 = Ohhhh 10= Buzzzz 11 = Meh
6	518	0-11	Osc 1 Wave Right (see Osc 1 Wave Left)
7	519	0-255	Osc 1 FM
8	520	0-255	Osc 1 AM
9	521	0-127	Osc 1 Slop
10	522	0-127	Osc 1 Glide Amount
11	523	0-1	Osc 1 Sync 0 = Off 1 = On
12	524	0-1	Osc 1 Key Follow 0 = Off 1 = On
13	525	0-1	Osc 1 Wave Reset 0 = Off 1 = On
18	530	0-120	Osc 2 Pitch
19	531	0-100	Osc 2 Fine Tune
20	532	0-127	Osc 2 Level
21	533	0-19	Osc 2 Shape (see Osc 1 Shape)
22	534	0-127	Osc 2 Shape Mod
23	535	0-11	Osc 2 Wave Left (see Osc 1 Wave Left)
24	536	0-11	Osc 2 Wave Right (see Osc 1 Wave Left)
25	537	0-255	Osc 2 FM
26	538	0-255	Osc 2 AM
27	539	0-127	Osc 2 Slop

NRPN Layer A	NRPN Layer B	Value	Description
28	540	0-127	Osc 2 Glide Amount
29	541	0-1	Osc 2 Sync 0 = Off 1 = On
30	542	0-1	Osc 2 Key Follow 0 = Off 1 = On
31	543	0-1	Osc 2 Wave Reset 0 = Off 1 = On
36	548	0-120	Osc 3 Pitch
37	549	0-100	Osc 3 Fine Tune
38	550	0-127	Osc 3 Level
39	551	0-19	Osc 3 Shape (see Osc 1 Shape)
40	552	0-127	Osc 3 Shape Mod
41	553	0-11	Osc 3 Wave Left (see Osc 1 Wave Left)
42	554	0-11	Osc 3 Wave Right (see Osc 1 Wave Left)
43	555	0-255	Osc 3 FM
44	556	0-255	Osc 3 AM
45	557	0-127	Osc 3 Slop
46	558	0-127	Osc 3 Glide Amount
47	559	0-1	Osc 3 Sync 0 = Off 1 = On
48	560	0-1	Osc 3 Key Follow 0 = Off 1 = On
49	561	0-1	Osc 3 Wave Reset 0 = Off 1 = On
54	566	0-120	Osc 4 Pitch
55	567	0-100	Osc 4 Fine Tune
56	568	0-127	Osc 4 Level
57	569	0-19	Osc 4 Shape (see Osc 1 Shape)
58	570	0-127	Osc 4 Shape Mod
59	571	0-11	Osc 4 Wave Left (see Osc 1 Wave Left)

NRPN Layer A	NRPN Layer B	Value	Description
60	572	0-11	Osc 4 Wave Right (see Osc 1 Wave Left)
61	573	0-255	Osc 4 FM
62	574	0-255	Osc 4 AM
63	575	0-127	Osc 4 Slop
64	576	0-127	Osc 4 Glide Amount
65	577	0-1	Osc 4 Sync 0 = Off 1 = On
66	578	0-1	Osc 4 Key Follow 0 = Off 1 = On
67	579	0-1	Osc 4 Wave Reset 0 = Off 1 = On
72	584	0-127	Osc 1 Sub Octave
73	585	0-3	Glide Mode 0 = FixRate 1= FixRate A 2 = FixTime 3 = FixTime A
74	586	0-1	Glide 0 = Off 1 = On
75	587	0-12	Pitchbend Range Up
76	588	0-24	Pitchbend Range Down
80	592	0-127	Air
81	593	0-127	Girth
82	594	0-127	Hack
83	595	0-127	Decimate
84	596	0-127	Drive
90	602	0-164	LPF Frequency
91	603	0-127	LPF Resonance
92	604	0-127	LPF Key Amount
93	605	0-1	LPF 2/4 Pole 0 = Off 1 = On

NRPN Layer A	NRPN Layer B	Value	Description
94	606	0-127	HPF Frequency
95	607	0-127	HPF Resonance
96	608	0-127	HPF Key Amount
97	609	0-254	Feedback Amount 0 to 126 = -127 to -1 127 = 0 128 to 254 = 1 to 127
98	610	0-48	Feedback Tuning
99	611	0-127	Voice Volume
100	612	0-127	Pan Spread
101	613	0-127	Distortion Amount
103	615	0-127	VCA Envelope Amt
104	616	0-127	Velocity to VCA Env Amt
105	617	0-127	VCA Env Delay
106	618	0-127	VCA Env Attack
107	619	0-127	VCA Env Decay
108	620	0-127	VCA Env Sustain
109	621	0-127	VCA Env Release
110	622	0-1	VCA Env Repeat 0 = Off 1= On
114	626	0-254	LPF Envelope Amt 0 to 126 = -127 to -1 127 = 0 128 to 254 = 1 to 127
115	627	0-127	Velocity to LPF Env Amt
116	628	0-127	LPF Env Delay
117	629	0-127	LPF Env Attack
118	630	0-127	LPF Env Decay
119	631	0-127	LPF Env Sustain
120	632	0-127	LPF Env Release
121	633	0-1	LPF Env Repeat 0 = Off 1= On
125	637	0-254	Envelope 3 Amt

NRPN Layer A	NRPN Layer B	Value	Description
126	638	0-127	Velocity to Env 3 Amt 0 to 126 = -127 to -1 127 = 0 128 to 254 = 1 to 127
127	639	0-127	Envelope 3 Delay
128	640	0-127	Envelope 3 Attack
129	641	0-127	Envelope 3 Decay
130	642	0-127	Envelope 3 Sustain
131	643	0-127	Envelope 3 Release
132	644	0-1	Envelope 3 Repeat 0 = Off 1= On
133	645	0-97	Envelope 3 Destination (see table of modulation destinations and values)
136	648	0-254	Envelope 4 Amt 0 to 126 = -127 to -1 127 = 0 128 to 254 = 1 to 127
137	649	0-127	Velocity to Env 4 Amt
138	650	0-127	Envelope 4 Delay
139	651	0-127	Envelope 4 Attack
140	652	0-127	Envelope 4 Decay
141	653	0-127	Envelope 4 Sustain
142	654	0-127	Envelope 4 Release
143	655	0-1	Envelope 4 Repeat 0 = Off 1= On
144	656	0-97	Envelope 4 Destination (see table of modulation destinations and values)
147	659	0-255	LFO 1 Frequency

NRPN Layer A	NRPN Layer B	Value	Description
148	660	0-15	LFO 1 Sync Setting 0 = 32nd triplet 1 = 32nd 2 = 16th triplet 3 = 16th 4 = 8th triplet 5 = 8th 6 = quarter triplet 7 = 1 quarter 8 = dotted quarter 9 = half 10 = 3 quarters 11 = 4 quarters 12 = 6 quarters 13 = 8 quarters 14 = 16 quarters 15 = 32 quarters
149	661	0-1	LFO 1 Sync 0 = Off 1 = On
150	662	0-7	LFO 1 Shape 0 = triangle 1 = reverse sawtooth 2 = sawtooth 3= square 4 = pulse 1 5 = pulse 2 6 = pulse 3 7 = random
151	663	0-127	LFO 1 Amount
152	664	0-127	LFO 1 Slew Rate
153	665	0-127	LFO 1 Phase
154	666	0-1	LFO 1 Wave Reset 0 = Off 1 = On
155	667	0-97	LFO 1 Destination (see table of modulation destinations and values)
157	669	0-255	LFO 2 Frequency
158	670	0-15	LFO 2 Sync Setting (see LFO 1 Sync Setting)

NRPN Layer A	NRPN Layer B	Value	Description
159	671	0-1	LFO 2 Sync 0 = Off 1 = On
160	672	0-7	LFO 2 Shape (see LFO 1 Shape)
161	673	0-127	LFO 2 Amount
162	674	0-127	LFO 2 Slew Rate
163	675	0-127	LFO 2 Phase
164	676	0-1	LFO 2 Wave Reset 0 = Off 1 = On
165	677	0-97	LFO 2 Destination (see table of modulation destinations and values)
167	679	0-255	LFO 3 Frequency
168	680	0-15	LFO 3 Sync Setting (see LFO 1 Sync Setting)
169	681	0-1	LFO 3 Sync 0 = Off 1 = On
170	682	0-7	LFO 3 Shape (see LFO 1 Shape)
171	683	0-127	LFO 3 Amount
172	684	0-127	LFO 3 Slew Rate
173	685	0-127	LFO 3 Phase
174	686	0-1	LFO 3 Wave Reset 0 = Off 1 = On
175	687	0-97	LFO 3 Destination (see table of modulation destinations and values)
177	689	0-255	LFO 4 Frequency
178	690	0-15	LFO 4 Sync Setting (see LFO 1 Sync setting)
179	691	0-1	LFO 4 Sync 0 = Off 1 = On
180	692	0-7	LFO 4 Shape (see LFO 1 Shape)
181	693	0-127	LFO 4 Amount
182	694	0-127	LFO 4 Slew Rate
183	695	0-127	LFO 4 Phase

NRPN Layer A	NRPN Layer B	Value	Description
184	696	0-1	LFO 4 Wave Reset 0 = Off 1 = On
185	697	0-97	LFO 4 Destination (see list of modulation destinations and values)
187	699	0-255	Delay 1 Time
188	700	0-11	Delay 1 Sync Setting 0 = 64th 1 = 32nd 2 = dotted 32nd 3 = 16th 4 = dotted 16th 5 = 8th 6 = dotted 8th 7 = quarter 8 = dotted quarter 9 = half 10 = dotted half 11 = whole
189	701	0-1	Delay 1 Sync 0 = Off 1 = On
190	702	0-127	Delay 1 Amount
191	703	0-127	Delay 1 Feedback
192	704	0-127	Delay 1 Lowpass Filter
193	705	0-127	Delay 1 Highpass Filter
194	706	0-1	Delay 1 Filter Mode
195	707	0-255	Delay 2 Time
196	708	0-11	Delay 2 Sync Setting (see Delay 1 Sync Setting)
197	709	0-1	Delay 2 Sync 0 = Off 1 = On
198	710	0-127	Delay 2 Amount
199	711	0-127	Delay 2 Feedback
200	712	0-127	Delay 2 Lowpass Filter
201	713	0-127	Delay 2 Highpass Filter
202	714	0-1	Delay 2 Filter Mode

NRPN Layer A	NRPN Layer B	Value	Description
203	715	0-255	Delay 3 Time
204	716	0-11	Delay 3 Sync Setting (see Delay 1 Sync Setting)
205	717	0-1	Delay 3 Sync 0 = Off 1 = On
206	718	0-127	Delay 3 Amount
207	719	0-127	Delay 3 Feedback
208	720	0-127	Delay 3 Lowpass Filter
209	721	0-127	Delay 3 Highpass Filter
210	722	0-1	Delay 3 Filter Mode
211	723	0-255	Delay 4 Time
212	724	0-11	Delay 4 Sync Setting (see Delay 1 Sync Setting)
213	725	0-1	Delay 4 Sync 0 = Off 1 = On
214	726	0-127	Delay 4 Amount
215	727	0-127	Delay 4 Feedback
216	728	0-127	Delay 4 Lowpass Filter
217	729	0-127	Delay 4 Highpass Filter
218	730	0-1	Delay 4 Filter Mode
219	731	0-26	Mod 1 Source (see table of modulation sources and values)
220	732	0-254	Mod 1 Amount 0 to 126 = -127 to -1 127 = 0 128 to 254 = 1 to 127
221	733	0-97	Mod 1 Destination (see table of modulation destinations and values)
223	735	0-26	Mod 2 Source (see table of modulation sources and values)
224	736	0-254	Mod 2 Amount 0 to 126 = -127 to -1 127 = 0 128 to 254 = 1 to 127
225	737	0-97	Mod 2 Destination (see table of modulation destinations and values)

NRPN Layer A	NRPN Layer B	Value	Description
227	739	0-26	Mod 3 Source (see table of modulation sources and values)
228	740	0-254	Mod 3 Amount 0 to 126 = -127 to -1 127 = 0 128 to 254 = 1 to 127
229	741	0-97	Mod 3 Destination (see table of modulation destinations and values)
231	743	0-26	Mod 4 Source (see table of modulation sources and values)
232	744	0-254	Mod 4 Amount 0 to 126 = -127 to -1 127 = 0 128 to 254 = 1 to 127
233	745	0-97	Mod 4 Destination (see table of modulation destinations and values)
235	747	0-26	Mod 5 Source (see table of modulation sources and values)
236	748	0-254	Mod 5 Amount 0 to 126 = -127 to -1 127 = 0 128 to 254 = 1 to 127
237	749	0-97	Mod 5 Destination (see table of modulation destinations and values)
239	751	0-26	Mod 6 Source (see table of modulation sources and values)
240	752	0-254	Mod 6 Amount 0 to 126 = -127 to -1 127 = 0 128 to 254 = 1 to 127
241	753	0-97	Mod 6 Destination (see table of modulation destinations and values)
243	755	0-26	Mod 7 Source (see table of modulation sources and values)
244	756	0-254	Mod 7 Amount 0 to 126 = -127 to -1 127 = 0 128 to 254 = 1 to 127

NRPN Layer A	NRPN Layer B	Value	Description
245	757	0-97	Mod 7 Destination (see table of modulation destinations and values)
247	759	0-26	Mod 8 Source (see table of modulation sources and values)
248	760	0-254	Mod 8 Amount 0 to 126 = -127 to -1 127 = 0 128 to 254 = 1 to 127
249	761	0-97	Mod 8 Destination (see table of modulation destinations and values)
251	763	0-26	Mod 9 Source (see table of modulation sources and values)
252	764	0-254	Mod 9 Amount 0 to 126 = -127 to -1 127 = 0 128 to 254 = 1 to 127
253	765	0-97	Mod 9 Destination (see table of modulation destinations and values)
255	767	0-26	Mod 10 Source (see table of modulation sources and values)
256	768	0-254	Mod 10 Amount 0 to 126 = -127 to -1 127 = 0 128 to 254 = 1 to 127
257	769	0-97	Mod 10 Destination (see table of modulation destinations and values)
259	771	0-26	Mod 11 Source (see table of modulation sources and values)
260	772	0-254	Mod 11 Amount 0 to 126 = -127 to -1 127 = 0 128 to 254 = 1 to 127
261	773	0-97	Mod 11 Destination (see table of modulation destinations and values)
263	775	0-26	Mod 12 Source (see table of modulation sources and values)

NRPN Layer A	NRPN Layer B	Value	Description
264	776	0-254	Mod 12 Amount 0 to 126 = -127 to -1 127 = 0 128 to 254 = 1 to 127
265	777	0-97	Mod 12 Destination (see table of modulation destinations and values)
267	779	0-26	Mod 13 Source (see table of modulation sources and values)
268	780	0-254	Mod 13 Amount 0 to 126 = -127 to -1 127 = 0 128 to 254 = 1 to 127
269	781	0-97	Mod 13 Destination (see table of modulation destinations and values)
271	783	0-26	Mod 14 Source (see table of modulation sources and values)
272	784	0-254	Mod 14 Amount 0 to 126 = -127 to -1 127 = 0 128 to 254 = 1 to 127
273	785	0-97	Mod 14 Destination (see table of modulation destinations and values)
275	787	0-26	Mod 15 Source (see table of modulation sources and values)
276	788	0-254	Mod 15 Amount 0 to 126 = -127 to -1 127 = 0 128 to 254 = 1 to 127
277	789	0-97	Mod 15 Destination (see table of modulation destinations and values)
279	791	0-26	Mod 16 Source (see table of modulation sources and values)
280	792	0-254	Mod 16 Amount 0 to 126 = -127 to -1 127 = 0 128 to 254 = 1 to 127
281	793	0-97	Mod 16 Destination (see table of modulation destinations and values)

NRPN Layer A	NRPN Layer B	Value	Description
283	795	0-1	Unison 0 = Off 1 = On
284	796	0-127	Unison Detune
285	797	0-1	Unison Mode 0 = Off 1 = On
286	798	0-5	Unison Key Assign 0 = low note 1 = low retrig 2 = high note 3 = high retrig 4 = last note 5 = last retrig
287	X	0-127	Split Point
288	X	0-2	A/B Mode 0 = normal 1 = split on 2 = stack on
289	801	0-1	Arpeggiator 0 = Off 1= On
290	802	0-4	Arpeggiator Mode 0 = Up 1 = Down 2 = Up + Down 3 = Assign 4 = Random
291	803	0-2	Arpeggiator Range 0 = 1 Octave 1 = 2 Octaves 2 = 3 Octaves

NRPN Layer A	NRPN Layer B	Value	Description
292	804	0-10	Arp Clock Divide 0 = half 1 = quarter 2 = eighth 3 = eighth, half swing 4 = eighth, full swing 5 = eighth triplet 6 = sixteenth 7 = sixteenth, half swing 8 = sixteenth, full swing 9 = sixteenth triplet 10 = thirty-second
293	805	0-3	Arpeggiator Repeats
294	806	0-1	Arp Auto Latch 0 = Off 1 = On
295	807	0-1	Arp Lock On/Off 0 = Off 1 = On
288	800	30-250	BPM
301-333	813-845	0-127	Arp Note (A rest can be achieved in Lock Notes mode if the high data bit is set to a 1; if the high data bit is set to 0 the normal note value is sent.)
334-366	846-878	0-127	Arp Velocity
427	939	0-127	Delay 1 Pan
428	940	0-127	Delay 2 Pan
429	941	0-127	Delay 3 Pan
430	942	0-127	Delay 4 Pan
480	992		Name Character 1
481	993		Name Character 2
482	994		Name Character 3
483	995		Name Character 4
484	996		Name Character 5
485	997		Name Character 6
486	998		Name Character 7
487	999		Name Character 8

NRPN Layer A	NRPN Layer B	Value	Description
488	1000		Name Character 9
489	1001		Name Character 10
490	1002		Name Character 11
491	1003		Name Character 12
492	1004		Name Character 13
493	1005		Name Character 14
494	1006		Name Character 15
495	1007		Name Character 16
496	1008		Name Character 17
497	1009		Name Character 18
498	1010		Name Character 19
499	1011		Name Character 20

The following table shows the allowed Name Characters and their values (ASCII code).

ASCII	32	33	34	35	36	37	38	39	40	41	43	44
Character		!	"	#	$	%	&	'	(	)	+	,
ASCII	45	46	48	49	50	51	52	53	54	55	56	57
Character			0	1	2	3	4	5	6	7	8	9
ASCII	59	61	64	65	66	67	68	69	70	71	72	73
Character	;	=	@	A	B	C	D	E	F	G	H	I
ASCII	74	75	76	77	78	79	80	81	82	83	84	85
Character	J	K	L	M	N	O	P	Q	R	S	T	U
ASCII	86	87	88	89	90	91	93	94	95	96	97	98
Character	V	W	X	Y	Z	[	]	^	_	`	a	b
ASCII	99	100	101	102	103	104	105	106	107	108	109	110
Character	c	d	e	f	g	h	i	j	k	l	m	n
ASCII	111	112	113	114	115	116	117	118	119	120	121	122
Character	o	p	q	r	s	t	u	v	w	x	y	z
ASCII	123	125										
Character	{	}										

The following tables list the values used with the program parameters to specify modulation sources and destinations.

Mod Source	
Off	0
Osc 1	1
Osc 2	2
Osc 3	3
Osc 4	4
LFO 1	5
LFO 2	6
LFO 3	7
LFO 4	8
Lowpass Env	9
VCA Env	10
Env 3	11
Env 4	12
Pitchbend	13
Mod Wheel	14
Slider 1 Position	15
Slider 2 Position	16
Slider 1 Pressure	17
Slider 2 Pressure	18
Aftertouch	19
Breath; CC#2	20
Foot Pedal; CC#4	21
Expression; CC#11	22
Velocity	23
Note Number	24
Random	25
DC	26
Audio Out	27

Mod Destination	Value
Mod Destination	Value
Off	0
Osc 1 Freq	1
Osc 2 Freq	2
Osc 3 Freq	3
Osc 4 Freq	4
Osc All Freq	5
Osc 1 Level	6
Osc 2 Level	7
Osc 3 Level	8
Osc 4 Level	9
Osc 1 Shape Mod	10
Osc 2 Shape Mod	11
Osc 3 Shape Mod	12
Osc 4 Shape Mod	13
Sub Osc Level	14
Osc 1 FM	15
Osc 2 FM	16
Osc 3 FM	17
Osc 4 FM	18
Osc All FM	19
Osc 1 AM	20
Osc 2 AM	21
Osc 3 AM	22
Osc 4 AM	23
Osc All AM	24
Osc All Slop	25
Air	26
Girth	27
Hack	28
Decimate	29
Drive	30
LPF Cutoff	31
LPF Resonance	32

Mod Destination	Value
HPF Cutoff	33
HPF Resonance	34
VCA	35
Pan	36
Pan Spread	37
Feedback Amount	38
Feedback Tuning	39
Delay 1 Amount	40
Delay 2 Amount	41
Delay 3 Amount	42
Delay 4 Amount	43
Delay 1 Time	44
Delay 2 Time	45
Delay 3 Time	46
Delay 4 Time	47
Delay 1 Feedback	48
Delay 2 Feedback	49
Delay 3 Feedback	50
Delay 4 Feedback	51
Delay 1 Pan	52
Delay 2 Pan	53
Delay 3 Pan	54
Delay 4 Pan	55
LFO 1 Freq	56
LFO 2 Freq	57
LFO 3 Freq	58
LFO 4 Freq	59
LFO 1 Amount	59
LFO 2 Amount	61
LFO 3 Amount	62
LFO 4 Amount	63
LPF Env Amount	64
Amp Env Amount	65
Env 3 Amount	66

Mod Destination	Value
Env 4 Amount	67
LPF Env Attack	68
Amp Env Attack	69
Env 3 Attack	70
Env 4 Attack	71
All Env Attack	72
LPF Env Decay	73
Amp Env Decay	74
Env 3 Decay	75
Env 4 Decay	76
All Env Decay	77
LPF Env Release	78
Amp Env Release	79
Env 3 Release	80
Env 4 Release	81
All Env Release	82
Mod 1 Amount	83
Mod 2 Amount	84
Mod 3 Amount	85
Mod 4 Amount	86
Mod 5 Amount	87
Mod 6 Amount	88
Mod 7 Amount	88
Mod 8 Amount	90
Mod 9 Amount	91
Mod 10 Amount	92
Mod 11 Amount	93
Mod 12 Amount	94
Mod 13 Amount	95
Mod 14 Amount	96
Mod 15 Amount	97
Mod 16 Amount	98

Sysex Messages

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)

The Prophet 12 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 1010	Prophet 12 ID (Family LS)
0000 0001	Family MS
0000 0000	Family Member LS
0000 0000	Family Member MS
0jjj nnnn	Main Software version: jjj - Minor rev; nnnn - Major rev
1111 0111	End of Exclusive (EOX)

Request Program Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 1010	Prophet 12 ID
0000 0101	Request Program Transmit
0000 00vv	Bank Number, 0 - 7
0vvv vvvv	Program Number, 0 - 127
1111 0111	End of Exclusive (EOX)

The Prophet 12 will respond by sending out the Program Data in the format described below in *Program Data Dump*.

Request Program Edit Buffer Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 1010	Prophet 12 ID
0000 0110	Request Program Edit Buffer Transmit
1111 0111	End of Exclusive (EOX)

Prophet 12 will respond by sending out the current Program edit buffer in the format described below in Program Edit Buffer Data Dump.

Request Global Parameter Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 1010	Prophet 12 ID
0000 1110	Request Global Parameter Transmit
1111 0111	End of Exclusive (EOX)

Prophet 12 will respond by sending out the current values of Global Parameters in the format described in *Global Parameters Data Dump*.

Program Data Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 1010	Prophet 12 ID
0000 0010	Program Data
0000 00vv	Bank Number: 0 - 7
0vvv vvvv	Program Number: 0 - 98
0vvv vvvv	1024 bytes expanded to 1171 MIDI bytes in "packed MS bit" format
1111 0111	End of Exclusive (EOX)

Program Edit Buffer Data Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 1010	Prophet 12 ID
0000 0011	Edit Buffer Data
0vvv vvvv	1024 bytes expanded to 1171 MIDI bytes in "packed MS bit" format
1111 0111	End of Exclusive (EOX)

Global Parameters Data Dump

Value	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 1010	Prophet 12 ID
0000 1111	Main Parameter Data
0vvv vvvv	50 nibbles (LS then MS) for 25 Global parameters
1111 0111	End of Exclusive (EOX)

Note: The Global Parameters Data Dump is not recognized when received; it is only transmitted when requested. NRPN messages are used to change Globals.

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 F6 F5 F4 F3 F2 F1 F0
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 explains why it takes 1171 MIDI bytes to transmit 1024 Program data bytes.

Appendix E: Support

Troubleshooting

Here are a few suggestions for resolving problems that may occur.

The arpeggiator has stopped running.
Check the Clock settings in the Global menu to ensure the Prophet 12 is set to Master or, if set to Slave, make sure the Prophet 12 is receiving MIDI clock.

Some of the programs sound different than before.
Check the Mod Wheel position on your controller keyboard. The Mod Wheel can do a lot more than just add vibrato. Also, check the Clock settings in the Global menu to ensure the Prophet 12 is set to Master or, if set to Slave, make sure the Prophet 12 is receiving MIDI clock.

There is a ground hum in the audio output.
USB can cause ground loops, so try to resolve any grounding issues between the computer and the Prophet 12. Or use MIDI, which is opto-isolated.

The Prophet 12 is behaving erratically.
This is almost always caused by a MIDI data loop. Make sure that any MIDI Thru functionality is turned off on the MIDI interface/hardware or in the MIDI software application (sequencer or whatever). Disconnect all the Prophet 12's MIDI connections—MIDI and USB cables—and see if the problem persists. You can also monitor the MIDI traffic with MIDI Monitor (Mac OS) or MIDI-OX (Windows) to see if the Prophet 12 is being overrun with duplicate messages.

Two voices play with each keystroke.
There may be a MIDI loop. Unplug the MIDI and/or USB cables and see if the problem persists. This is generally caused by MIDI Thru functionality in either the MIDI interface/hardware or in a MIDI software application.

The Prophet 12 doesn't seem to respond to its controls.
If the synth seems to be responding normally, but doesn't make sound, make sure Local Control is on in the Global menu.

MIDI System Exclusive data is not be transmitted/received.
Check the SysEx settings in the Global menu.

The Prophet 12 plays out of tune.
Check Master Coarse Tune and Master Fine Tune in the Global menu. If that seems correct, check the pitch wheel calibration on your controller keyboard.

Only voices 7 through 12 make sound; the LEDs for voices 1 through 6 light up, but those voices are silent.
Make sure the audio cables are not plugged into the B Outputs.

Only voices 1-6 or 7-12 make sound; the LEDs for the non-sounding voices don't light up.
You may be in MIDI Multi Mode (Global, 4) and only transmitting on one MIDI channel.

A filter sounds strange or out of tune.
Run Autotune Filters in the Global menu.

> **Note:** It is not necessary to run any of the calibration routines on a regular basis. You should only run it if you are experiencing problems.

Still experiencing a problem with the Prophet 12? Reset Globals in the Global menu.

Contacting Technical Support

If you are still having a problem with the Prophet 12, contact Technical Support at support@davesmithinstruments.com. Please include your Prophet 12's serial number, the version of the operating system (displayed in the Global screen), and the purchase date.

> **Note:** If you have not already reset the Global parameters and run the calibration routines (see Troubleshooting, above), you should do it before contacting Technical Support. It's probably the first thing they'll ask you to do.

Warranty Repair

Dave Smith Instruments warrants that the Prophet 12 will be free from defects in materials and/or workmanship for 1 year from the date of purchase. Please register your product online at www.davesmithinstruments.com to establish the date of purchase. (This is not a requirement for warranty service, but it will help expedite the process.)

Please contact support@davesmithinstruments.com to determine the best course of action for getting your Prophet 12 repaired. For your own protection, as well as ours, please do not return any product to Dave Smith Instruments without a return authorization (RA) number. To issue an RA number, Technical Support needs:

- Your name
- Your return address
- Your email address
- A phone number where you can be reached
- Your Prophet 12's serial number
- The date of purchase and where purchased

If you need to return your instrument for repair, you are responsible for getting it to DSI. We highly recommend insuring it and packing in the original packaging. Damage resulting from shipping a product with insufficient packaging is not covered by warranty.