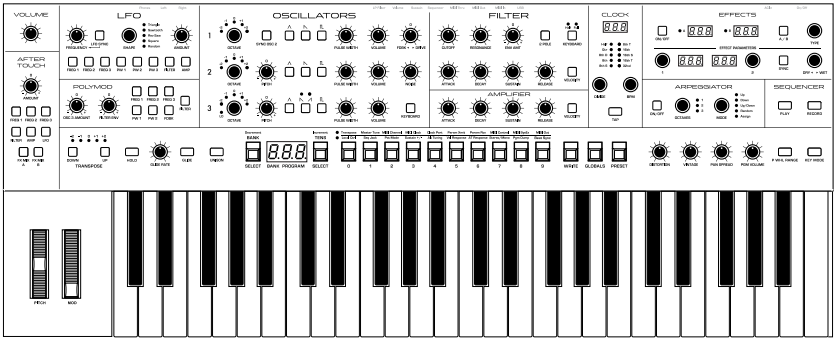
TRIGON-6

Operation Manual



SEQUENTIAL®

THE SEQUENTIAL CREW

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Operation Manual

Version 1.1

November, 2022

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USA

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Tested to Comply
With FCC Standards
FOR OFFICE USE

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

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

Cet appareil numerique de la classe A respecte toutes les exigences du Reglement sur le materiel brouilleur du Canada.

For pluggable equipment, the socket-outlet must be installed near the equipment and must be easily accessible.

For Technical Support, email: support@sequential.com

CALIFORNIA PROP 65 WARNING

This product may expose you to chemicals including BPA, which is known to the State of California to cause cancer and birth defects or other reproductive harm. Though independent laboratory testing has certified that our products are several orders of magnitude below safe limits, it is our responsibility to alert you to this fact and direct you to: https://www.p65warnings.ca.gov for more information.

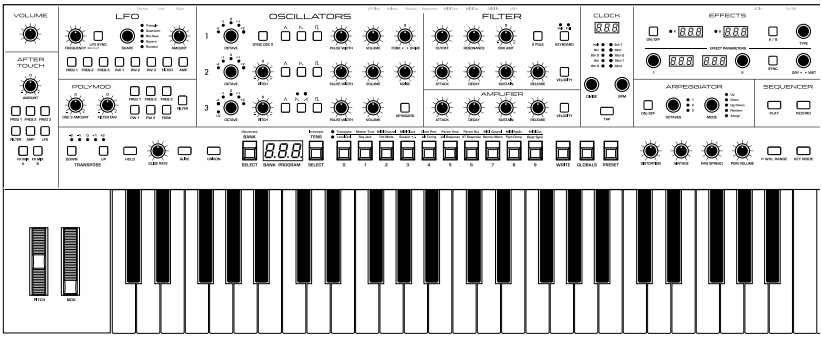
Table of Contents

Getting Started

The Trigon-6 is a six-voice, polyphonic analog synthesizer with discrete voltage-controlled oscillators and filters, and voltage-controlled amplifiers. It was designed to provide all of the warmth and presence of a vintage-era, ladder filter-equipped synth with the added convenience and stability of a state-of-the-art, modern instrument.

The Trigon-6 is first and foremost a performance instrument. All of its sound-shaping controls are immediately accessible on its front panel, packing a tremendous amount of power and versatility into a compact, easy-to-use format.

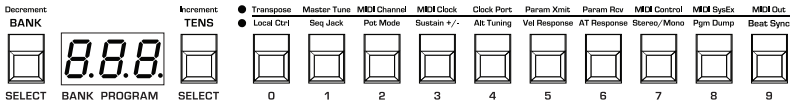
You can find in-depth information about each of the Trigon-6's parameters in later sections of this manual. But don't hesitate to dive right in and start turning knobs and pressing buttons before you begin reading. You can always get back to where you started, even if you have no idea what you're doing. So start exploring and keep your ears and mind open!



Trigon-6 front panel

Sound Banks

The Trigon-6 contains a total of 1000 programs. 500 are permanent and 500 can be overwritten. Banks 0-4 are User Banks that can be overwritten. Banks 5-9 are Factory Banks that are permanent. You can edit the programs of either bank, but you can only save them to Banks 0-4. As shipped from the factory, presets 000-499 are identical to 500-999.



Program bank, tens, and number selectors

Selecting Programs

Use the BANK, TENS, and PROGRAM SELECTOR buttons to select and recall programs.

To choose a program:

1. Hold down the BANK button then press a PROGRAM SELECTOR button (0-9) to specify the "hundreds" bank of the program.
2. Hold down the TENS button then press a PROGRAM SELECTOR button (0-9) to specify the "tens" digit of the program.
3. Press a PROGRAM SELECTOR button (0-9) to specify the "ones" digit of the program.

To choose program 123, for example:

1. Hold BANK and press 1. Then release the BANK button.
2. Hold TENS and press 2. Then release the TENS button.
3. Press PROGRAM SELECTOR button 3.

It's not always necessary to enter all 3 digits of a program number to recall it.

For example:

- If the current program is 100 and you want to recall program 101, simply press "1."
- If the current program is 100 and you want to recall program 110, hold down the TENS button and press "1."
- If the current program is 100 and you want to recall program 115, hold down the TENS button and press "1." Then release the TENS button and press "5."

Pressing the GLOBALS button three times in a row saves the current program as the default program that appears when you turn on the Trigon-6.

Stepping Through Presets Using the Inc/Dec Buttons

Instead of having to manually enter the Banks, Tens, and Ones digits to recall a preset, you can also use the Increment/Decrement buttons to step through programs sequentially, one by one.

To do this:

1. Hold BANK SELECT/DEC and press TENS SELECT/INC to increment by a single program.
2. Hold TENS SELECT/INC and press BANK SELECT/DEC to decrement by a single program.

Editing Programs

Because all of the sound-shaping controls of the Trigon-6 appear on its front panel, editing an existing program is simple: just turn a knob and listen to its effect. Keep turning knobs and pressing buttons and if you like what you've created, save the program. (See "" on page 5.)

The rotary controls on the front panel are a mixture of "endless" rotary encoders and potentiometers or "pots." You can choose between three different modes that determine how the synth reacts when parameters are edited with a pot. For details, see "Pot Mode" on page 15.

How to Check a Parameter Setting in a Preset

When you're editing a preset, the Trigon-6 has a convenient way of indicating the programmed (saved) value for any knob parameter: Whenever you turn a knob and reach the saved value of a given parameter, an LED dot in the main Trigon-6 display will illuminate.

The dot illuminates when a knob position matches a preset's saved parameter value

Comparing an Edited Program to its Original State

When editing a program, it's often useful to compare its edited state to its original state to evaluate your edits. Alternatively, before saving a program to a new location you may want to check the program in the target location before you overwrite it.

To compare an edited program to a saved version:

1. Edit a program.
2. Press the WRITE button. It starts flashing.
3. Press the GLOBAL button. Both LEDs on the button light up, indicating COMPARE mode.
4. Play the keyboard to hear the saved version of the sound.
5. To disable the compare function and return to the edited sound, turn off the GLOBAL button. Programs can't be written while in compare mode.
6. If you want to save the edited sound, the WRITE button is still flashing and ready to save, so enter a location with the PROGRAM SELECTOR buttons. The sound is saved.
7. Alternatively, if you want to cancel saving and continue editing, press the WRITE button. It stops flashing and saving is canceled.

Creating a Program from Scratch

An existing program can be very useful as a jumping off point for new sounds. But it's also useful (and educational) to create a new sound from scratch. The Trigon-6 makes this easy by providing a "Basic Preset" that you can quickly recall at any time. This preset is very simple, with a single oscillator as its basis.

To recall the Basic Preset:

1. Hold down the PRESET button.
2. Press the WRITE button.

Live Panel Mode

The Trigon-6 also features a "live panel" mode in which its sound switches to the current settings of its knobs and switches. In other words, the current preset is ignored and what you see on the front panel is what you hear. This is a great mode for learning, experimentation, and instant gratification.

To enter live panel mode:

- Press the PRESET button to toggle it off. Note that you can't change programs or banks with Preset off.

To return to preset mode:

- Press the PRESET button again to toggle it on.

PRESET

Toggling off the PRESET button enables "live panel" mode

Saving a Program

If you've created a sound that you like, you'll probably want to save it. Saving a program overwrites a previously saved program. Sound designers often save many incremental versions of a program as they continue to refine it. These intermediate versions often make good jumping off points for new sounds.

To save a program to the same preset location:

1. Press the WRITE button. Its LED begins blinking.
2. Press a PROGRAM SELECTOR button (0-9) to specify the "ones" digit of the program.
3. The WRITE button LED stops blinking and the program is saved.

Be careful when WRITE is enabled. You can change banks and tens without executing WRITE, but once you press a PROGRAM SELECTOR button (0-9) for the "ones" digit, the WRITE command is executed and the program at that location is overwritten.

To save a program to a different bank location:

1. Press the WRITE button. Its LED begins blinking.
2. Hold down the BANK button then press a PROGRAM SELECTOR button to specify the "hundreds" bank of the program. You can only save to Banks 0-4.
3. Hold down the TENS button then press a PROGRAM SELECTOR button (0-9) to specify the "tens" digit of the program.
4. Press a PROGRAM SELECTOR button (0-9) to specify the "ones" digit of the program.
5. The WRITE button LED stops blinking and the program is saved.

Canceling Save

Sometimes you may want to cancel saving a program before you commit.

To cancel the Save process before you commit:

- If the WRITE button LED is flashing, press it again. The LED stops flashing and saving is canceled. You can return to editing if you want.

Comparing Before You Save

Before saving a program to a new location, it's a good idea to listen to the program in the target location to make sure you really want to overwrite it.

To evaluate a program before you overwrite it:

1. Get ready to save by pressing the WRITE button. It starts flashing.
2. Press the GLOBAL button. Both LEDs on the button light up, indicating COMPARE mode.
3. Use the program buttons to navigate to the sound you want to compare and play the keyboard to hear the sound.
4. To disable the compare function and go back to the edited sound, turn off the GLOBAL button. Programs can't be written while in compare mode.
5. If you want to save the edited sound, the WRITE button is still flashing and ready to save, so enter a location with the program buttons. The sound is saved.
6. Alternatively, if you want to cancel saving and continue editing, press the WRITE button. It stops flashing and saving is canceled.

Using Poly Chain

If you have two Trigon-6 synthesizers you can link them together with MIDI to increase the total available polyphony to 12 voices. We call this poly chaining. If you have a Trigon-6 keyboard and a Trigon-6 module, you will most likely use the keyboard as the master and the module as the slave.

To poly chain two Trigon-6 synths:

1. With a MIDI cable, connect the rear-panel MIDI OUT of the first Trigon-6 (the master) to the MIDI IN of the second Trigon-6 (the slave).
2. On the master Trigon-6, press the GLOBALS button then press program selector button 9 (MIDI OUT).
3. Use the BANK/DECREMENT and TENS/INCREMENT to select PLY (poly).
4. Press the GLOBALS button twice to exit GLOBALS mode.

The two synths are now poly chained. You can now play up to twelve notes simultaneously. Another advantage of this arrangement is that notes with long release times are less likely to be cut off as you play additional notes.

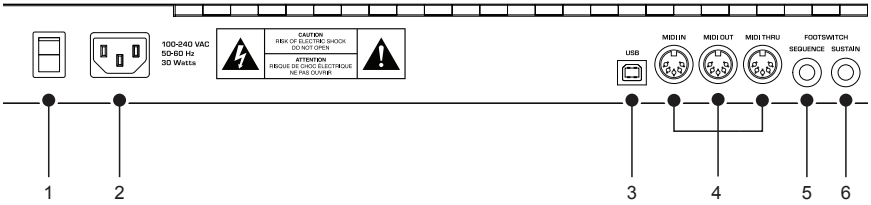
Moving to the Next Level

The Trigon-6 is filled with possibilities for sound creation. Although we realize that you'd rather spend your time exploring its capabilities, we'd like to point you toward a few things that will help you tailor the instrument to your needs.

First, check out the *Global Settings* section of this manual. Read about Pot Modes and determine which works best for you when you're editing sounds. You'll also find information about MIDI setup. Read this to more effectively integrate the Trigon-6 into your MIDI rig. To get the most out of the Trigon-6's live performance capabilities, read up on using a footswitch or expression pedal.

And finally, be on the lookout for tips and notes scattered throughout this manual to gain a better working knowledge of the Trigon-6. The better you know your instrument, the more you'll get out of it. We wish you many hours of musical exploration!

Connections



1. On/Off Switch—Turns the synth on and off.

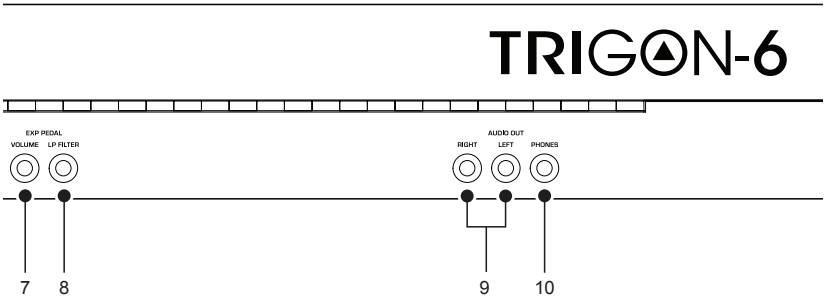
2. AC Power Connector—Accepts a standard, grounded IEC power cord. Operates over a range of 100 to 240 volts and 50 to 60 Hz.

3. USB Connector—For bidirectional MIDI communication with a computer. The Trigon-6 is a Class Compliant USB device and does not require additional drivers when used with Mac OS or Windows. See “Using USB” on page 60 for more information.

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

5. Footswitch-Sequence—Accepts a momentary, normally open or normally closed footswitch to turn the sequencer or arpeggiator on and off. Alternatively, an audio signal connected to this jack can be used to either control sequencer/arpeggiator playback, or to gate the filter and amplifier envelopes while notes are held. See “Seq Jack” on page 15 for more information about choosing the appropriate mode for these behaviors.

6. Footswitch-Sustain—Accepts a momentary, normally open or normally closed footswitch to control sustain. See “3. Sustain +/- : Nor, Rev, n-r, r-n (Normally Open, Normally Closed, Sustain Normally Open/Sequencer Normally Closed, Sustain Normally Closed/Sequencer Normally Open)—The Sustain pedal polarity parameter affects both the sustain pedal and sequencer jack input ports. There are two types of momentary footswitches, normally open and normally closed. Either type can be used with the Trigon-6. Not sure which type you have? If



the behavior of the footswitch is the opposite of what is expected — that is, down is off and up is on — changing this setting will correct that." on page 16 for more information.

7. Expression Pedal-Volume—Accepts a standard expression pedal that has a variable resistor on a TRS (tip-ring-sleeve) ¼ inch phone plug. Once connected, you can use the pedal to control volume to add expressiveness and dynamics to live performance.

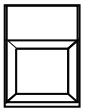
8. Expression Pedal-LP Filter—Accepts a standard expression pedal that has a variable resistor on a TRS (tip-ring-sleeve) ¼ inch phone plug. Once connected, you can use the pedal to control the cutoff frequency of the low-pass filter to add expressiveness to live performance.

9. Audio Outputs—Unbalanced, ¼ inch audio outputs. The Trigon-6 sounds great in stereo, but can be switched to mono if needed. See "Mono/Stereo" in *Global Settings* on page 16.

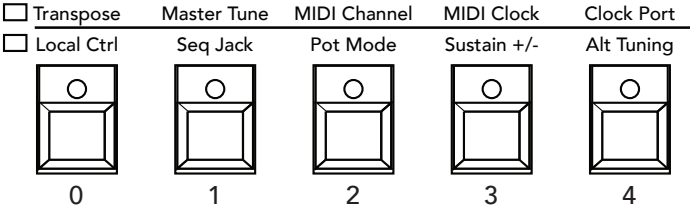
10. Headphones—A ¼ inch stereo headphone jack. Headphone volume is controlled by the MASTER VOL knob on the front panel.

Global Settings

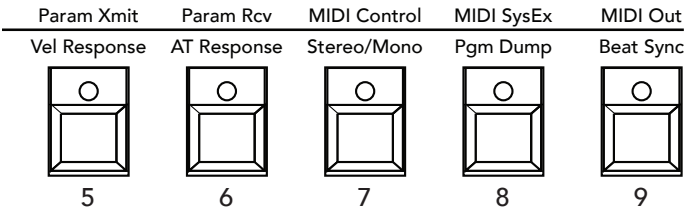
Global settings are parameters that affect all programs. These include settings such as Master Tune, MIDI Channel, MIDI Clock, and others. Global parameters are printed above the numeric program selector switches (0 - 9). Use the Globals switch to choose between the two sets. The red LED indicates that the upper row is active. The yellow LED indicates that the lower row is active



The Globals button



Globals 0-4



Globals 5-9

Use the Bank and Tens buttons to scroll forward and backward, respectively, through parameter settings

To set a Global parameter:

1. Press the GLOBALS button. Pressing it once activates the upper set of parameters. Pressing it a second time enables the lower set of parameters.
2. Press the program selector button (0 - 9) that corresponds to the desired parameter. The parameters are printed above each switch.
3. Use the BANK and TENS buttons as decrement and increment buttons to step through available settings.
4. Once you've chosen the desired setting, press the GLOBALS button again to exit.

Globals - Top Row

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

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

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

3. MIDI Clock: Sets the Trigon-6's ability to send and receive MIDI clock messages:

- Off: MIDI Clock is neither sent nor received
- Out: MIDI Clock is sent, but not received
- In: MIDI Clock is received, but not sent
- In Thru (i-0): MIDI Clock is received and passed to MIDI Out
- In, No Start/Stop (nSS): Receives MIDI Clock but does not respond to MIDI Start or Stop commands.

 When set to IN or IN THRU, if no MIDI clock is present at the selected input, the arpeggiator and sequencer will not function.

4. Clock Port: MID, USB—Sets the ports, MIDI or USB, by which MIDI clock signals are received.

5. Param Xmit: Off, CC, NR, CAS, nAS—Changes to the values of front panel controls are transmitted via MIDI as Continuous Controllers (CC) or Non-registered Parameter Number (NR). Transmission of parameters can also be turned off. You could, for example, turn the filter CUTOFF frequency knob on the Trigon-6 and have it affect the cutoff frequency of another synthesizer. CAS allows the transmission of MIDI Out for the Arp/Sequencer in addition to Continuous Controllers. nAS allows the transmission of MIDI Out for Arp/Sequencer in addition to NRPNs. For a list of Trigon-6 CCs and NRPNs, see the online MIDI Implementation document.

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.

6. Param Rcv: Off, CC, NR—Sets the method by which parameter changes are received via MIDI. As with transmission, NRPNs are the preferred method.

7. MIDI Control: Off, On—When On, the synth will respond to MIDI controllers, including Pitch Wheel, Mod Wheel, Pedal, Volume.

8. MIDI Sysex: MID, USB— When set to MIDI (MID) it will receive and transmit them using the MIDI ports/cables When set to USB it will receive and transmit them using the USB port/cable. MIDI SysEx messages are used when sending and receiving a variety of data including, programs, alternative tunings, system updates, and more.

9. MIDI Out: MID, USB, btH, PLY— Sets the port by which MIDI data will be transmitted (MIDI, USB, both MIDI and USB, polychain). Selecting the PLY/polychain option allows you to link two Trigon-6 synths to each other, to increase the total available polyphony to 12 voices.

Globals - Bottom Row

0. Local Control: Off, On—When on (the default), the keyboard and front panel controls directly affect the Trigon-6. When off, the controls are transmitted via MIDI but do not directly affect the "local" synth (that is, the Trigon-6). This is primarily useful for avoiding MIDI data loops that can occur with some external sequencers.

1. Seq Jack: NOR, Tri, Gat, T-g (Normal, Trigger, Gate, T-G)—Selects the mode for signals received on the rear-panel Sequencer jack.

- With NORMAL selected, a footswitch will start sequencer playback.
- With TRIG selected, an audio signal connected to the SEQUENCER jack will step the sequencer when the sequencer's PLAY button is on.
- With GATE selected, an audio signal connected to the SEQUENCER jack will trigger and gate the envelopes while you hold a note or chord. Additionally, turning on the sequencer or arpeggiator will add sequencer or arpeggiator playback—but controlled by the Trigon-6's clock BPM and VALUE settings and not the audio trigger.
- With T-G (TRIGGER+GATE) selected, an audio signal connected to the SEQUENCER jack will trigger and gate the envelopes while you hold a note or chord. Additionally, pressing the sequencer's PLAY button will also add synchronized sequencer playback.


For best results when triggering the sequencer with an audio signal, use a loud signal with a sharp attack/decay and little or no sustain.

2. Pot Mode: Rel, Pas, Jup (Relative, Passthru, Jump)—The rotary controls on the 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.)

In *Relative* mode, 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 an internal value range of 0 to 127. Let's say the physical position of the RESONANCE pot is the equivalent to 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.

3. Sustain +/- : Nor, Rev, n-r, r-n (Normally Open, Normally Closed, Sustain Normally Open/Sequencer Normally Closed, Sustain Normally Closed/Sequencer Normally Open)—The Sustain pedal polarity parameter affects both the sustain pedal and sequencer jack input ports. There are two types of momentary footswitches, normally open and normally closed. Either type can be used with the Trigon-6. Not sure which type you have? If the behavior of the footswitch is the opposite of what is expected — that is, down is off and up is on — changing this setting will correct that.

4. Alt Tuning: Nor, 1…16 (Normal, 1…16)—Selects one of the Trigon-6's built-in tunings. Set to NORMAL, the tuning is standard, chromatic tuning. Choosing 1 through 16 selects an alternative, non-chromatic, non-Western scale that can be used to emulate ethnic instruments or in other creative ways.

See "Appendix A: Alternative Tunings" on page 59?> for a description of each tuning. Additional tunings can be imported into the Trigon-6 as a SysEx message. For more information, see Appendix A.

5. Vel Response: 0-7 (Curve 0, Curve 1, Curve 2, Curve 3, Curve 4, Curve 5, Curve 6, Curve 7)—Sets one of eight velocity curves to adjust the keyboard's velocity response to your playing style.

6. AT Response: 0-3 (Curve 0, Curve 1, Curve 2, Curve 3)—Sets one of four pressure curves to adjust the keyboard's aftertouch response to your playing style.

7. Stereo/Mono: Ste, Mon (Stereo, Mono)—The Trigon-6 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.

8. Pgm Dump: Prg, Ten, Ban, usr, All (Program, Tens, Bank, User Banks, All)—Transmits the current program, ten programs from the currently selected bank and tens location, the current bank, all user banks (0-4), or all banks (both user and factory) in SysEx format via the selected MIDI port. (See: "MIDI Sysex.") Dumped programs will load back into the same bank and program location in memory when received by the Trigon-6 via MIDI.

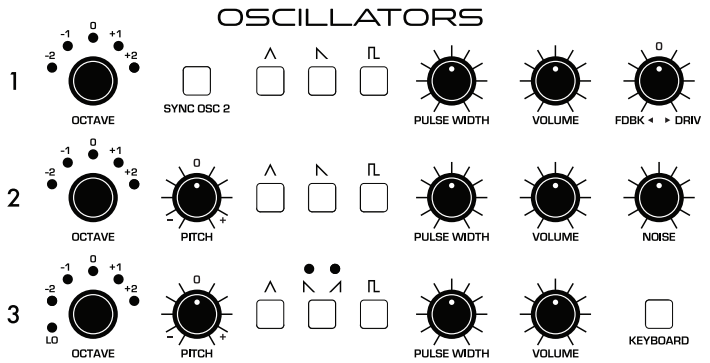
9. Arp Beat Sync: Off, On---When set on, Arpeggiator note playback occurs only on the beat (relative to the current clock divide setting) regardless of when you press a key on the keyboard.

Oscillators

Oscillators provide the raw building blocks of the Trigon-6's sound by producing *waveforms*, each of which has its own inherent sound character based on its harmonic content. The Trigon-6 has three oscillators and a noise generator per voice. Level controls for each of these are located in the Oscillator section.

Oscillators 1 and 2 are capable of generating triangle, sawtooth, and variable-width pulse waves. Oscillator 3 is capable of generating triangle, sawtooth, reverse sawtooth, and variable-width pulse waves. These waveshapes are selected by pressing the corresponding waveshape button. Multiple waveshapes can be selected simultaneously for each of the three oscillators.

The oscillators on the Trigon-6 are extremely stable. To emulate the pleasing instability of vintage instruments, use the VINTAGE parameter to dial in as little or as much voice-to-voice variation as you like.



Oscillators

Oscillator 2 can be hard-synced to Oscillator 1 for complex, harmonically-rich sounds when modulated.

Oscillators 2 and 3 feature a fine PITCH knob for detuning and thickening sounds. Oscillator 3's OCTAVE control features a LO setting that allows it to function as an LFO for modulation purposes, and a KEYBOARD switch that disables keyboard control over its pitch (useful when used as an LFO, or for drones and other effects).

Oscillator Parameters

Octave: Sets the base oscillator frequency of an oscillator over a 5-octave range from -2 to +2, while Oscillator 3 can be dropped to LFO frequency by setting this parameter to LO.


The global Master Tune settings affect the pitch of all oscillators. See *"Globals - Top Row" on page 13* for more information.

Pitch: Fine tune control with a range of 7 semitones (a major 5th) up or down. The 12 o'clock position is centered. Steps are in cents (50 cents = 1/2 semitone). This can be used to set Oscillators 2 & 3 to different intervals from each other and from Oscillator 1.

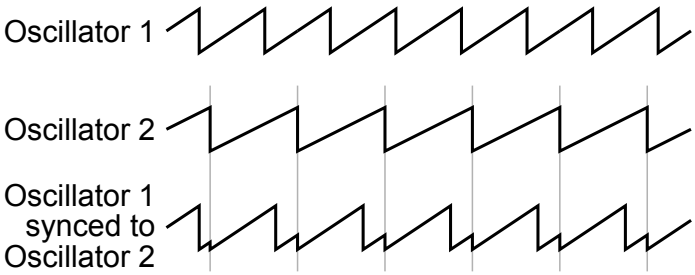
Waveshape: Triangle, Sawtooth, (Reverse Sawtooth), Pulse—Used to select the waveshape generated by the oscillator. Multiple waveshapes can be set for each oscillator by pressing multiple Waveshapes buttons. This can allow for interesting harmonic-up effects by selecting both sawtooth and pulse, for example.

In the case of Oscillator 3 in LO mode, complex LFO waveforms can be created by selecting multiple Waveshapes. Note also that Oscillator 3 features an additional reverse sawtooth waveshape.

Pulse Width: Changes the width of the pulse wave from a square wave when the PULSE WIDTH knob is at center position, to a zero duty cycle pulse (off) at counter clockwise, and a narrow pulse when the PULSE WIDTH knob is fully clockwise.

Applying pulse width modulation using POLY MOD or the LOW FREQUENCY OSCILLATOR is a great way to add movement and thickness to a sound, especially when creating pad or string-like sounds.

Sync Osc 2: Off, On—Turns Oscillator 2 hard sync on. SYNC forces Oscillator 2 to restart its cycle every time Oscillator 1 starts a cycle. This provides a way to create more complex, harmonically rich shapes from simple waveforms—especially when the frequency of Oscillator 2 is set to a different interval than Oscillator 1.



Oscillator hard sync

Use Poly Mod to sweep the pitch of Oscillator 2 when it is synced to generate the classic, hard-edged sync sound.

Keyboard: Off, On—When off, Oscillator 3 ignores the keyboard and note data received via MIDI and plays at its base frequency setting. Oscillator 3 pitch can still be affected by modulation from other sources when in this mode.

Volume

Each oscillator features a volume control. This allows you to mix the levels of the three oscillators into the filter.

Rather than limit the Trigon-6's outputs to keep the instrument from clipping, we allow you to adjust levels at various points in its signal path. This gives you the option to "overload" things in interesting ways, if you wish to do so. If not, try reducing the levels of the oscillators using the VOLUME controls. VOLUME at 50% results in relatively clean signals into the filter.

Feedback<>Drive

The FDBK <> DRIVE knob is bidirectional and controls two separate parameters.

When the knob is turned clockwise, DRIVE affects the amount of filter saturation by increasing the oscillators' overall output.

When turned counter-clockwise, FEEDBACK can introduce a range of tones from harmonic to chaotic by feeding the Trigon-6's voice card outputs back into the filter stage. This allows a feedback path for each voice.

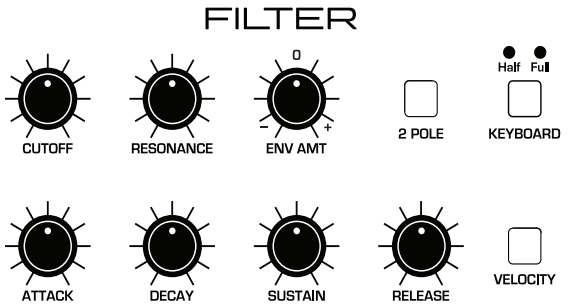
Noise

Sets the output level of the white noise generator.

Filter

Filters take the basic, raw sound of the oscillators and noise generator and subtract frequencies, changing the harmonic content and character of their sound. This change can be varied over time using the Filter Envelope to produce more dynamic, animated timbres.

In simple terms, a lowpass filter cuts high frequencies. The Trigon-6's 2/4-pole switchable lowpass filter allows for a wide range of sonic possibilities, with a classic sound. Just like in historic 4-pole lowpass filter circuits, when RESONANCE is increased some bass is lost from the signal.



The Filter section.

Cutoff: Sets the filter's cutoff frequency. A lowpass filter removes frequencies from high to low — cutting the high frequencies and passing the low, hence the name "lowpass."

Resonance: Emphasizes a narrow band of frequencies around the cutoff frequency. High levels of resonance can cause the filter to self oscillate and generate its own pitch.

Env Amount: Sets the amount of modulation from the filter envelope to the filters. Higher amounts more dramatically affect the cutoff frequency. This control is bipolar. Positive settings produce standard behavior as described in "Filter Envelope" on page 22. Negative settings invert the envelope. Experiment with this control to create a variety of expressive filtering effects.

2-Pole: on, off—When enabled, sets the filter to two-pole mode. A 2-pole lowpass filter has a less steep cutoff slope, which allows more upper order oscillator harmonics to pass through the filter stage.

Keyboard: off, half, full—Sets the amount of modulation from the keyboard to the filter's cutoff frequency. Selecting HALF or FULL means that the higher the note played on the keyboard, the more the filter opens. This is useful for adding brightness to a sound as higher notes are played, which is typically how acoustic instruments behave. If both HALF and FULL are off, keyboard filter tracking is off, meaning that filter frequency is unaffected by playing higher or lower notes on the keyboard.

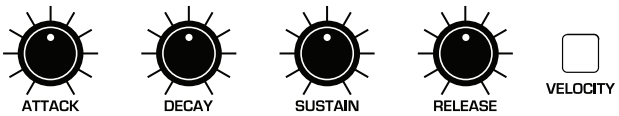
Setting KEYBOARD to FULL when the filter is self oscillating will cause the filter-generated pitch to follow the keyboard in tune (i.e. in semitones). Setting the KEYBOARD to HALF will cause the filter-generated pitch to follow the keyboard pitch in quarter tones.

Filter Envelope

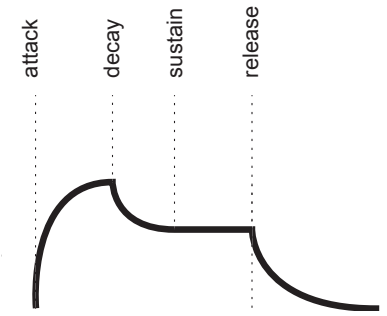
The Trigon-6's lowpass filter is modulated by a dedicated four-stage envelope generator. The Filter Envelope is used to shape the harmonic characteristics of a synthesized sound over time by giving you filtering control over its attack, decay, sustain, and release stages.

This is one of the most important factors in designing a sound. Without an envelope, the filters would be completely static. They would stay open or closed by a fixed amount that wouldn't change over the duration of a sound. That's not very interesting to listen to and it's not how instruments behave in the real world.

In general, sounds produced by an instrument are brighter at their beginning (the attack stage) and grow mellower as they die out (the decay and release stages). In other words, their harmonic content changes over time. This is exactly what the filter envelope is designed to emulate.



Filter envelope



A typical 4-stage envelope

Attack: Sets the attack time of the envelope. The higher the setting, the slower the attack time and the the longer it takes for the filter to open from the level set with the filter CUTOFF knob to the level set by the filter envelope amount. Percussive sounds typically have sharp (short) attacks.

Decay: Sets the decay time of the envelope. After a sound reaches the filter frequency set at its attack stage, DECAY controls how quickly the filter then transitions to the cutoff frequency set with the SUSTAIN knob. The higher the setting, the longer the decay. Percussive sounds, such as synth bass, typically have shorter decays (and a generous amount of low-pass filter resonance).

Sustain: Sets the filter cutoff frequency for the sustained portion of the sound. The sound will stay at this filter frequency for as long as a note is held on the keyboard.

Release: Sets the release time of the envelope. This controls how quickly the filter closes after a note is released.

The description of envelope behavior above is true when the ENVELOPE AMOUNT parameter is set to a positive value. But since this control is actually bi-polar, it is possible to set a negative amount of modulation. In this case, the envelopes are inverted and their behavior changes. The best way to get a feel for the difference is to experiment with both positive and negative settings of the ENVELOPE AMOUNT parameter.

The cutoff frequency setting may limit the effect of the envelope on the filter. For example, if CUTOFF is at its highest setting, a positive envelope amount will have no effect on the filter since the filter is already completely open.

Velocity: Allows key velocity to influence filter cutoff frequency. If on, the harder you play, the more the filter will open and the brighter the sound will be. If off, key velocity will not affect the filter. This control allows for more touch-sensitive sounds.

Changing the Filter Envelope's Response Curve

By default, the envelopes of all synthesizers are designed to have certain type of response curve that is largely dependent on the preference of the designer. In most cases, this can't be changed. The current preference is that the faster or snappier the envelopes, the better.

However, in the case of the Trigon-6, there is a hidden feature in the Poly Mod section that allows you to modify the responsiveness of the Filter Envelope's ADSR controls. This opens up a new level of fine adjustment of these controls that is subtle but powerful. Try it and see.

To adjust the responsiveness of the filter envelope:

1. Select a program — such as a synth brass sound — that has a slightly soft but bright attack.
2. Repeatedly play a series of notes or chords on the keyboard, so you can hear the effect of the adjustments as you follow the steps below.
3. In the Poly Mod section, enable FILTER as the only destination (disable all other Poly Mod destinations).
4. In the Poly Mod section, turn the FILTER ENV control slightly counter-clockwise. Try a setting of about 11 o'clock.
5. Continue to play a series of chords and turn the ENV AMOUNT knob clockwise in the LOW-PASS FILTER section. Try moving it back and forth between 1 o'clock and 3 o'clock.
6. As you do this, compare different settings of the Poly Mod FILTER ENV control, the Low-Pass Filter ENV AMOUNT, and different Attack, Decay, Sustain, and Release settings on the Filter Envelope.

The interaction of these controls is worth exploring for greater flexibility and control of the Filter Envelope.

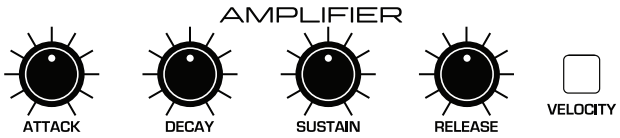
Amplifier Envelope

After passing through the filters, a synthesized sound goes into an analog voltage controlled amplifier or VCA, which controls its overall loudness. The VCA has a dedicated four-stage envelope generator.

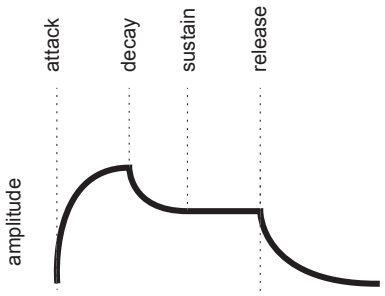
The Amplifier Envelope is used to shape the volume characteristics of a sound over time by giving you control over its attack, decay, sustain, and release stages. Along with the filter envelope, this is one of the most important factors in designing a sound.

Without a volume envelope, the loudness of a sound wouldn't change over the duration of a note. It would begin immediately, remain at its full volume for the duration of the note, then end immediately when the note was released. Again, that's not very interesting sonically and it's not typically how instruments behave in the real world.

To give you a real-world example, the main difference between the sound of the wind and the sound of a snare drum is that they have very different volume envelopes. Otherwise, they are essentially both white noise. Wind has a relatively slow attack, a long sustain, and a long decay and release. A snare drum has a sharp attack, no sustain, and virtually no decay or release. But again, they are both fundamentally white noise.



Amplifier envelope



A typical four-stage, ADSR envelope shape

Attack: Sets the attack time of the envelope. The higher the setting, the slower the attack time and the longer it takes for a sound to reach its full volume. Pads typically have softer (longer) attacks. Percussive sounds have sharper (shorter) attacks.

Decay: Sets the decay time of the envelope. After a sound reaches its full volume at its attack stage, DECAY controls how quickly the sound transitions to the level set with the SUSTAIN control. The higher the setting, the longer the decay. Percussive sounds, such as synth bass, typically have shorter decays.

Sustain: Sets the sustain level of the envelope. The higher the setting, the louder the sustained portion of the sound will be. The sound will stay at this level for as long as a note is held on the keyboard.

Release: Sets the release time of the envelope. This controls how quickly a sound dies out after a note is released.

To recreate the "gated VCA" effect used on certain classic rock anthems, choose an organ sound, then set the VCA ENV amount to zero, route the LFO square wave to AMP with an INITIAL AMT setting of 100% and hold a few chords.

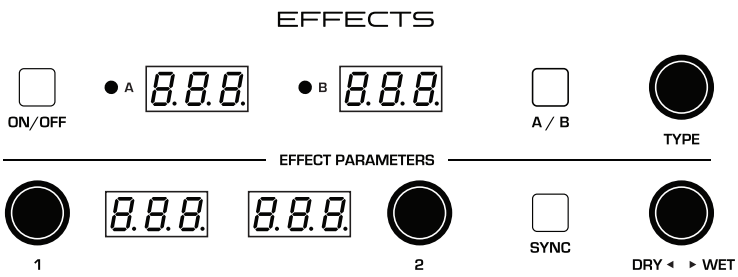
Velocity: This button enables keyboard velocity to modulate the VCA Envelope Amount. The harder you play, the more the VCA envelope is affected. This makes for more touch-sensitive sounds.

Effects

The Trigon-6 EFFECTS section allows you to add up to two, 24-bit, 48 kHz digital effects to any sound. Though the Trigon-6 sounds great on its own, adding a touch of reverb or delay can enhance many sounds with a subtle (or not so subtle) sense of ambience and depth. Other effects such as the chorus and phaser are useful for adding more conspicuous tonal enhancement as well as emulating classic instruments such as string ensembles and so on.

The effects path is fully digital, even with only a single effect active. The ON/OFF switch enables and disables both Effect A and Effect B, using a true bypass, ensuring a pure analog signal path with effects off.

Effects settings are saved individually with each program. Time-based effects such as the Delays can be synchronized to the arpeggiator, sequencer, or MIDI clock to produce repeats that occur on the beat.



The Effects section

Effects are divided into sets A and B. You can choose a single effect from each set. Effect A and B are applied one after another, in series. For this reason, reverb effects are only available as Effect B, since it's the last stage in the serial effects chain — where reverb is traditionally applied. Either effect can also be set to "off."

Effect A:

- "bbd" - vintage bucket-brigade emulation
- "ddl" - classic digital delay
- "CHO" - vintage chorus
- "PH1" - vintage 6-stage phaser, high resonance
- "PH2" - vintage 6-stage phaser, lower resonance
- "PH3" - emulation of Tom Oberheim's original phaser design
- "rin" - ring modulator
- "FL1" - vintage flanger, high resonance
- "FL2" - vintage flanger, low resonance

Effect B:

- "bbd" - vintage bucket-brigade emulation
- "ddl" - classic digital delay
- "CHO" - vintage chorus
- "PH1" - vintage 6-stage phaser, high resonance
- "PH2" - vintage 6-stage phaser, lower resonance
- "PH3" - emulation of Tom Oberheim's original phaser design
- "rin" - ring modulator
- "FL1" - vintage flanger, high resonance
- "FL2" - vintage flanger, low resonance
- "HAL" - classic hall emulation
- "rOO" - classic room emulation
- "PLA" - classic plate emulation
- "SPr" - vintage guitar-amp-style spring emulation

To use Effects:

1. Press the ON/OFF switch to turn on Effects.
2. Press EFFECT and choose A or B, depending on which you want to apply and configure.
3. Turn the TYPE knob to select an effect. Names are abbreviated. For instance "bbd" is the bucket-brigade delay. Refer to the list above.
4. Turn the DRY<>WET knob to the right to blend in a good amount of the processed signal. You'll want to be able to clearly hear the effect when you tweak its settings. You can dial it down afterward.
5. Use the parameter 1 and parameter 2 knobs to adjust the effect's parameters to your taste. See "Main Parameters" on page 30 for details on the adjustable parameters on each effect type.
6. Finally, adjust the MIX knob to optimize the amount of the effect. A value of 0 is completely dry, while a value of 127 is completely wet (a 100% processed signal).
7. Repeat as needed to add a second effect.

Main Parameters

On/Off: Turns both effects, A and B, on and off. The ON/OFF switch uses a true bypass, ensuring a pure analog signal path.

Effect: A, B—Selects either effect A or B for editing. Once selected, all adjustments apply to that effect.

Type: Off, bbd, ddl, CHO, PH1, PH2, HAL, rOO, PLA, SPr—Selects the effect type.

Mix: 0...127—Sets the balance between the processed (wet) signal and unprocessed (dry) signal. 0 is completely dry, and 127 is completely wet.

Clock Sync: On, Off—When a delay effect is chosen, this enables syncing of the timed delay repeats (feedback) to the Arpeggiator, Sequencer, or MIDI clock. When Sync is on, delay time provides the following values:

Value	Delay Time
1	4 beats
2d	3 beats
2	2 beats
4t	1 beat
4d	1 1/2 beat
4	1 beat
8d	3/4 of 1 beat
8	1/2 of 1 beat
8t	1/2 of 1 beat
16d	3/8 of 1 beat
16	1/4 of 1 beat

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 (i.e. 2 seconds divided by 2).

Parameter 1: Variable, depending on the effect—This knob adjusts parameter 1 for the chosen effect. Each effect has two adjustable parameters, which differ depending on the effect. See “Main Parameters” on page 30 for details about the adjustable parameters on each effect type.

Parameter 2: Variable, depending on the effect—This knob adjusts parameter 2 for the chosen effect. Each effect has two adjustable parameters, which differ depending on the effect.

Display	Effect Type	Parameter 1	Parameter 2
bbd	bucket-brigade delay	delay time	feedback amount
ddl	digital delay	delay time	feedback amount
cho	chorus	rate	depth
PH1	phaser 1	rate	depth
PH2	phaser 2	rate	depth
HAL	hall reverb	time	early reflections
rOO	room reverb	time	early reflections
PLA	plate reverb	time	early reflections
SPr	spring reverb	decay	tone

bbd: This is a vintage bucket-brigade delay emulation. Bucket-brigade delays were originally a type of analog delay characterized by relatively short delay times and a warmer character than digital delays due to their loss of treble and clarity in the delayed analog signal. Adjustable parameters are delay time and feedback amount.

To recreate a classic bucket-brigade time-shifting effect, try adjusting the TIME parameter in real time.

ddl: This is a classic digital delay, Adjustable parameters are delay time and feedback amount.

CHO: This is a vintage chorus emulation. Use it to thicken and add animation to any sound. Adjustable parameters are rate and depth.

PH1: This is a vintage phaser emulation with high resonance. Use it to add a deep, sweeping, swirling resonant effect to a sound. Adjustable parameters are rate and depth.

PH2: This is a vintage phaser emulation with lower resonance. Use it to add a swirling resonant effect to a sound. Adjustable parameters are rate and depth.

PH3: This is a faithful emulation of Tom Oberheim's original phaser design. Use it to add a swirling resonant effect to a sound. Adjustable parameters are rate and depth.

rin: This is a faithful emulation of Tom Oberheim's original ring modulator design. Use it to add a complex harmonic effect to a sound. Adjustable parameters are the modulation frequency and low note pitch tracking on/off.

HAL: This is a Hall reverb. It's the largest of the available reverbs. Adjustable parameters are reverb time and early reflection amount.

rOO: This is a Room reverb. It's the second largest of the available reverbs. Adjustable parameters are reverb time and early reflection amount.

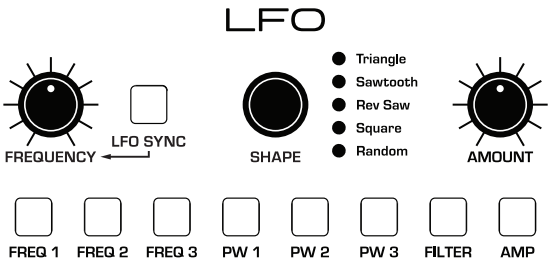
PLA: This is a Plate reverb. It emulates a classic reverb plate. Adjustable parameters are reverb time and early reflection amount.

SPr: This is a Spring reverb. It emulates a vintage, guitar-amp-style reverb. Adjustable parameters are decay and tone.

Low Frequency Oscillator

The LFO is a special-purpose oscillator that produces a frequency below the range of human hearing. The LFO is typically used for periodic modulation such as vibrato (periodic pitch modulation) and tremolo (periodic amplitude modulation).

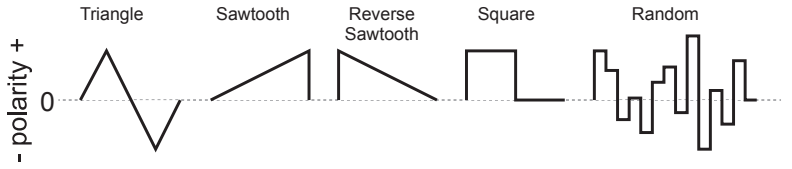
The LFO on the Trigon-6 produces a variety of waveshapes, including triangle, sawtooth, reverse sawtooth, square, and random. Though most often used for low-frequency modulation, the Trigon-6 LFO can actually function at speeds that extend into the audible range for extreme effects.



The Low-Frequency Oscillator

Triangle and Random waves are bipolar. That is, their waveshape is positive for half of their cycle and negative for the other half. In the case of the triangle wave, this 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. Random, also known as "sample and hold," generates a series of random values, each held for the duration of one cycle

The square wave, sawtooth, and reverse sawtooth generate only positive values. In the case of the square wave this makes it possible to generate natural-sounding trills.



LFO waveshapes

The Trigon-6 has a sixth "hidden" LFO waveshape that you can use as a modulation source — noise. To access this, choose RANDOM then turn FREQUENCY all the way clockwise. This generates a white noise waveform.

The LFO can be free-running or synced to the arpeggiator, sequencer, or MIDI clock for tempo-synced effects such as filter sweeps, tremolo, and so on.

Frequency: Sets the frequency of the LFO waveshape routed to the destination. See also "LFO Sync" below.

LFO Sync: When on, the LFO synchronizes with the arpeggiator, sequencer, or MIDI clock. By default, the LFO wave cycle is reset when you press a key (but is not reset if you press a key while other notes are held).

Shape: Triangle, Sawtooth, Reverse Sawtooth, Square, Random—The wave shape of the LFO. A sixth waveshape, noise, can be generated by selecting RANDOM and turning the FREQUENCY knob all the way to the right.

Amount: Sets the initial amount of LFO modulation routed to the selected destinations. Setting an amount here applies the selected modulation continuously. If you set this parameter to zero but still select a modulation destination, modulation is only applied when using the Mod Wheel.

Freq 1: Selects the frequency of Oscillator 1 as a modulation destination. Use a triangle wave as a source to create vibrato. Use a square wave to create trills.

Freq 2: Selects the frequency of Oscillator 2 as a modulation destination.

Freq 3: Selects the frequency of Oscillator 3 as a modulation destination. Can be applied while Oscillator 3 is in LO mode.

PW 1: When Oscillator 1 is set to square wave, this modulates the pulse width of the wave. Use a triangle wave LFO to create a chorus-like effect often used to emulate strings.

PW 2: When Oscillator 2 is set to square wave, this modulates the pulse width of the wave.

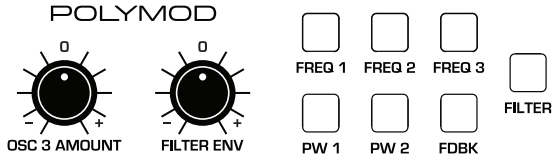
PW 3: When Oscillator 3 is set to square wave, this modulates the pulse width of the wave. Can be applied while Oscillator 3 is in LO mode.

Filter: Selects the Filter frequency as a modulation destination. Use a triangle wave LFO to create an auto-wah effect. Modulating Filter at high frequencies can create interesting timbres.

Amp: Selects the amplitude level as a modulation destination. Use a triangle wave LFO to create a tremolo effect.

Poly Mod

Although the overall sonic character of the Trigon-6 is determined by its analog oscillators and filters, much of its power to make truly unique and unusual sounds comes from the Poly Mod section.



The Poly Mod section

Poly Mod modulation sources:

- Oscillator 3 Amount
- Filter Envelope

Poly Mod modulation destinations:

- Oscillator 1 frequency
- Oscillator 2 frequency
- Oscillator 3 frequency
- Oscillator 1 pulse widrth
- Oscillator 2 pulse width
- Feedback
- Filter frequency

You can control how much the source affects the destination by dialing in a specific modulation amount with the OSC 3 or FILTER ENV knobs. Modulation amount can either be positive or negative.

Use Poly Mod to create complex harmonic effects ranging from FM (frequency modulation) to audio-rate filter modulation and beyond. Many classic sounds can be created through clever use of Poly Mod.

Poly Mod Parameters

Freq 1: Selects Oscillator 1 frequency as a modulation destination. Choose OSC 3 as a modulation source to produce FM effects with their characteristic complex harmonics and metallic timbre. Choose FILTER ENV as a destination source to sweep Oscillator 1's frequency.

Freq 2: Selects Oscillator 2 frequency as a modulation destination. Choose OSC 3 as a modulation source to produce FM effects with their characteristic complex harmonics and metallic timbre.

Freq 3: Selects Oscillator 3 frequency as a modulation destination. Choosing OSC 3 as a recursive modulation source could produce chaotic effects. Choose FILTER ENV as a modulation source to sweep Oscillator 3's frequency (in LO mode for a modulated modulator effect, for example).

PW 1: When Oscillator 1 is set to pulse wave, choosing this as a destination modulates its pulse width. This will animate the timbre of Oscillator 1 in interesting ways.

PW 2: When Oscillator 2 is set to pulse wave, choosing this as a destination modulates its pulse width. This will animate the timbre of Oscillator 2 in interesting ways.

Feedback: Choosing this as a destination allows you to modulate the amount of filter feedback.

Filter: Selects filter cutoff as a modulation destination.

When using OSC 3 as a modulation source, the modulation character is affected by the waveshape currently chosen for Oscillator 3 (triangle, sawtooth, rverse sawtooth, or square/pulse). Try setting Oscillator 3 to low frequency (using the LO setting) to further increase modulation possibilities.

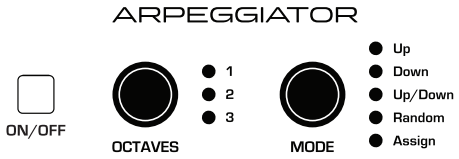
Arpeggiator

The Trigon-6 has a full-featured Arpeggiator. Turn it on, hold a chord and the Trigon-6 will play a pattern based on the individual notes held. Choose a mode (up, down, random, etc.), an octave range (1, 2, or 3), and a tempo, then pair it with an appropriately percussive sound, and you'll be surprised at the number of creative things you can do.

When HOLD is active, the Arpeggiator is in "relatch" mode, where playing a new chord latches to the new chord rather than adding notes to the existing chord.

If you enable HOLD, you can release the notes on the keyboard and the Arpeggiator will continue to play. In addition, the Arpeggiator features auto-latching: With HOLD on, played notes are held on and arpeggiated, and any additional notes you play are added to the arpeggio—as long as at least one key is continuously held.

You can sync the Arpeggiator to external MIDI clock, or even an external audio signal. When the Arpeggiator is playing, the Sequencer is disabled.



The Arpeggiator section

To use the Arpeggiator:

1. Press the Arpeggiator ON/OFF switch to turn it on.
2. Hold down one or more notes on the keyboard. The Arpeggiator plays them according to the settings you've chosen.
3. To latch arpeggiation on (so that you don't have to continuously hold down notes) press the HOLD button.
4. Adjust settings such as MODE, OCTAVE, BPM and VALUE.
5. To synchronize a delay effect to the Arpeggiator, turn on CLOCK SYNC in the Effects section, choose a delay, and adjust its delay time setting as desired.

Arpeggiator Beat Sync

This feature quantizes keyboard performance of the arpeggiator so that notes are quantized to the current clock divide setting. With this option enabled, arpeggiator note onset is quantized to the current DIVIDE value — regardless of the precision of your playing.

To enable Arpeggiator Beat Sync:

1. Press the GLOBALS button twice to activate the lower set of parameters.
2. Press program selector button 9.
3. Use the BANK and TENS buttons as decrement and increment buttons to set Beat Sync on or off.
4. Once you've chosen the desired setting, press the GLOBALS button again to exit.

An audio signal connected to the rear-panel FOOTSWITCH - SEQUENCE jack can be used to control arpeggiator (and sequencer) playback. This makes it possible to tempo sync the arpeggiator to a recorded drum track or other audio source. See "Seq Jack" on page 15 for more information about choosing the appropriate mode for these behaviors.

Arpeggiator Parameters

Divide—Selects a beat division relative to the BPM. See the table below:

Name	Tempo	Timing Division
Half	BPM/2	Half note
Qtr	BPM	Quarter note
8th	BPM x 2	Eighth note
8th D	BPM x 2	Eighth note, dot
8th S	BPM x 2	Eighth note, swing timing
8th T	BPM x 3	Eighth note triplets
16th	BPM x 4	Sixteenth note
16th S	BPM x 4	Sixteenth note, full swing timing
16th T	BPM x 6	Sixteenth note triplets
32nd	BPM x 8	Thirty-second note

On/Off—Turns the Arpeggiator on and off.

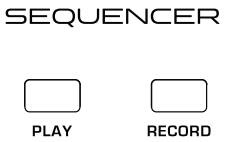
Octave: 1 Octave, 2 Octaves, 3 Octaves—Set to 1 Octave, only the keyed notes are arpeggiated. Set to 2 Octaves, the keyed notes and the notes one octave above them arpeggiate. Set to 3 Octaves, the keyed notes and the notes one and two octaves above them arpeggiate.

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

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
Random	Plays notes in random order
Assign	Plays notes in the order the keys were pressed

Sequencer

The Trigon-6's sequencer is similar to a classic step sequencer. It allows you to create a single sequence of up to 64 steps, including rests and ties, with up to 6 notes per step. In addition, you can play along with a sequence (provided there is available polyphony), making it a powerful live performance tool. When the Sequencer is playing, the Arpeggiator is disabled.



The Sequencer

An audio signal connected to the rear-panel FOOTSWITCH - SEQUENCE jack can be used to control sequencer playback. This makes it possible to tempo sync the sequencer (or arpeggiator) to a recorded drum track or other audio source. See "Seq Jack" on page 15 for more information about choosing the appropriate mode for these behaviors.

Programming the Sequencer

Though programming the sequencer is simple, you can create sequences that are rhythmically and melodically complex by combining a repeating phrase or bass line with chords, ties, and rests. You can play up to 64 steps with up to 6 notes held simultaneously per step. For most sequences you'll probably want to use sounds with a relatively sharp attack and short release.

Most factory programs have a sequence associated with them. Recall a program and press the Sequencer's PLAY button to hear its associated sequence.

To program a note sequence:

1. Press the RECORD button.
2. Play the sequence on the keyboard, step by step. The display indicates the current step as you play.

When recording a chord as a step, as long as you continue to hold at least one note down, you can keep adding notes to the chord/step, and even use the TRANSPOSE buttons to extend the keyboard range while doing it.

3. To add a rest as you play, press the TENS/INCREMENT button for that step, then continue playing.
4. To add a "tie" that extends the length of a note, continue to hold down the note(s) and press the TENS/INCREMENT button repeatedly to extend the note the number of steps you want.
5. When you're done, press PLAY to listen to your sequence.
6. To save the sequence, save the program and they are saved together. (See "Saving a Program" on page 5.)

If you want to play live along with the sequencer, be sure to leave voices available. In other words, don't play 6-note chords for every step in the sequence!

To play a sequence:

1. Press PLAY. The sequence plays back at the current BPM & DIVIDE setting.
2. To stop playback, press PLAY again.

Alternatively, you can start and stop sequencer playback using a footswitch connected to the rear-panel SEQ jack or using MIDI start/stop messages sent from a DAW or other MIDI device. See “Seq Jack” on page 15 for more information.

Use the BPM, DIVIDE, or TAP TEMPO controls to adjust sequencer playback speed.

To transpose a sequence:

1. Press PLAY. The sequence begins playback.
2. Press and hold RECORD and press a key on the keyboard. “Middle C” is the reference point. Playing a note above middle C transposes the sequence higher by that interval. Playing a note below middle C transposes the sequence lower by that interval.

If you’re using a program with Unison enabled, you don’t need to hold down the REC button. You can simply press a note on the keyboard and the sequence is transposed to that key. (When not using Unison, you must still hold down the REC button to enable transposition.)

Remember that “Middle C” is the reference point. Playing a note above middle C transposes the sequence higher by that interval. Playing a note below middle C transposes the sequence lower by that interval.

Correcting Notes When Recording a Sequence

While you are recording a sequence, it is possible to step backward using the Bank/Decrement button to correct notes. You can decrement as many steps as you like, but each time you step backward the sequencer erases the step. You must then re-record any steps/notes that occur after the current step. For example, if you play notes on steps 1-8, then decrement to step 4, you will need to manually re-play steps 5-8 again on the keyboard.

To step backward while recording a sequence:

1. Record a sequence normally by pressing the RECORD button, then playing notes on the keyboard. The display indicates the current step as you play.
2. Press the BANK SELECT/DECREMENT button. This will step back to the previous step so that you can re-record it. Stepping back erases the step.

MIDI Note Output from the Arpeggiator and Sequencer

The Trigon-6's arpeggiator and sequencer can output MIDI note numbers. Any notes that you hold on the Trigon-6 keyboard will be arpeggiated according to the current settings of the arpeggiator and output over MIDI (or USB) as MIDI notes. Similarly, any notes output by the sequencer will be output over MIDI (or USB) as MIDI notes. You can use this feature to drive other MIDI-equipped devices such as synthesizers and drum machines.

To enable MIDI Note output from the arpeggiator and sequencer:

1. Press the GLOBALS button then press program selector button 5 (PARAM XMIT).
2. Use the BANK and TENS buttons as decrement and increment buttons to step through available settings and select either CAS or NAS. Your choice depends on whether you were previously using CC or NRPN to send MIDI controller data to your external device, as either setting will send MIDI notes out. Choose CAS if CC. Choose NAS if NRPN.
3. Once you've chosen the desired setting, press the GLOBALS button twice to exit.

To control an external MIDI device:

1. Connect the MIDI or USB output of the Trigon-6 to the MIDI or USB input of the external device, depending on which type of connection the external device requires.
2. On the Trigon-6, press the GLOBALS button, then press program selector button 9 (MIDI OUT) to select nid (MIDI) or usb(USB).
3. Press the GLOBALS button twice to exit the Global menu.
4. On the external device, set the MIDI Channel and MIDI Receive port to match the Trigon-6.
5. Hold down a chord on the Trigon-6 or start sequencer playback. The external device will be triggered by the arpeggiated or sequenced notes.

Sequencer Parameters

Here are the controls and parameters used when interacting with the sequencer.

Record: On, Off—This switch turns sequencer recording on and off.

Play: On, Off—This switch turns sequencer playback on and off.

Clock

Sets the internal master clock for both the Sequencer and Arpeggiator.

BPM: 30…250—Sets the tempo for the Sequencer and Arpeggiator in BPM (beats per minute). The TAP TEMPO LED flashes at the BPM rate. When LFO SYNC is turned on, the BPM rate affects the LFO frequency. When syncing to an external MIDI clock source, the BPM setting has no effect.

Tap Tempo: 30…250—Tap this button at least 4 times to quickly set the tempo for the Sequencer and Arpeggiator. The LED flashes at the BPM rate you set.

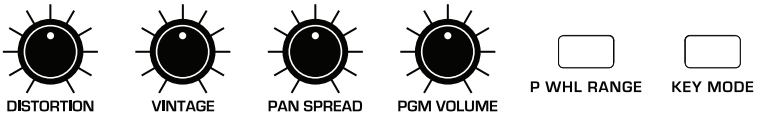
Divide: Sets the note value for each sequencer/arpeggiator step relative to the BPM. DIVIDE works with both internal and external clock sources. The following table lists the values:

Name	Tempo	Timing Division
Half	BPM/2	Half note
Qtr	BPM	Quarter note
8th	BPM x 2	Eighth note
8th D	BPM x 2	Eighth note, dot
8th S	BPM x 2	Eighth note, swing timing
8th T	BPM x 3	Eighth note triplets
16th	BPM x 4	Sixteenth note
16th S	BPM x 4	Sixteenth note, full swing timing
16th T	BPM x 6	Sixteenth note triplets
32nd	BPM x 8	Thirty-second note

Master Volume/Program Volume

The master output level of the Trigon-6 is controlled by the front-panel MASTER VOL knob. In addition, the volume of an individual program can be set with the PRGM VOL knob in the Additional Parameters section. This is useful for ensuring that your sounds have roughly the same volume from program to program. Unison sounds in particular can be very loud compared to other programs.

The Volume knob



The program volume knob (PRGM VOLUME) in the Miscellaneous Parameters section

To set the volume of an individual program:

1. Choose a program.
2. In the ADDITIONAL PARAMTERS section, turn the PRGM VOL knob to set its volume.
3. Save the program. (See "Saving a Program" on page 4.)

MIDI volume can also influence the overall volume of the Trigon-6 if you are controlling it from an external MIDI source.

Distortion

The Trigon-6 provides stereo analog distortion. This can be used to add warmth, harmonic complexity, and an aggressive edge to sounds. The character of the distortion is affected by the harmonic content of a program. Sounds with more high-end will sound different than sounds with fewer harmonics. To add distortion, use the DISTORTION knob.

Vintage

Introduces parameter variations from voice to voice. This electronic circuit variation behavior was a big part of why vintage synths sounded so warm, organic, and alive. Turning up the vintage knob adds progressively more variation between voices. Try it out!

Pan Spread

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 greater amounts. Every other voice goes in a different direction, left or right.

Pgm Volume

Adjusts the overall volume of an individual program.

There is enough gain in the Trigon-6 that if you set some programs to a high PROGRAM VOLUME, clipping distortion may occur. If this happens, try lowering the PROGRAM VOLUME, the volumes of the oscillators, or the RESONANCE parameter of the filter.

P Whl Range

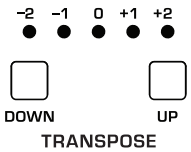
0...12 Semitones— Selects the range in semitones when moving the Pitch Wheel forward or backward. Twelve semitones equals 1 octave.

Key Mode

Low Note (LO), High Note (Hi), Last Note (Las), Low Note Retrigger (LOr), High Note Retrigger (Hir), Last Note Retrigger (LAr)—Selects the key priority when more than one key is played simultaneously when in Unison mode. LOW NOTE, HIGH NOTE and LAST NOTE are monophonic playback modes that give priority to the lowest, highest, or last note played, as their names imply.

Transpose

The UP and DOWN buttons in the TRANSPOSE section transpose the keyboard up or down in octaves. The LED indicates the current keyboard transposition state. Transposing the keyboard also changes the MIDI note numbers of the keys so that MIDI notes sent are also transposed. Transpose settings are global and are not saved with individual programs.



The Transpose controls

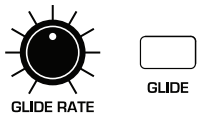
Hold

When HOLD is on, any notes played will continue to play until HOLD is turned off. When used in conjunction with the Arpeggiator, notes are latched on and replaced by any new note(s) struck. If HOLD is on and at least one key continuously held down, any new notes played are added to the arpeggio.

The Hold button

Glide

Glide or *portamento* causes the pitch of a note to glide up or down from the pitch of the previously played note on the triggered voice. Glide is turned on and off using the GLIDE switch, but the GLIDE AMOUNT must also be set. If the GLIDE button is on, but GLIDE AMOUNT is set to 0, GLIDE has no effect.



The Glide controls

There are four modes that determine how GLIDE behaves.

Fixed Rate (FR**):** 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. This is the default glide mode.

Fixed Rate A (FRA**):** The same as Fixed Rate, but glide is only applied when playing legato when Unison mode is on. 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.

Fixed Time (FT**):** Glide is set to a fixed time, regardless of the interval between notes.

Fixed Time A (FTA**):** The same as Fixed Time, but glide only occurs when playing legato.

To select a glide mode:

1. Press and hold the GLIDE switch. The numeric display shows the currently selected Glide mode.
2. To select a different mode, continue to hold down the GLIDE switch then press the BANK/DECREMENT and TENS/INCREMENT switches to step through the other choices.
3. When finished, release the GLIDE switch.

Unison

When UNISON is on, the Trigon-6 functions like a monophonic synthesizer in that only 1 note can be played at a time. However, that one note can be powered by as many as six voices, depending on how many you choose to use. With up to 18 oscillators powering a single note (3 oscillators per voice x 6 voices), you can create some very dense, speaker-rattling sounds.

If you want to create an ultra heavy synth bass, try using Unison!

Unison gives you control over not only how many voices to stack, and what note gets priority if you happen to play more than one note on the keyboard. (This is called the key assign mode or *note priority*. See "Key Assign Modes" on page 48 for details.) You can also detune the Oscillators using the PITCH controls to thicken a sound. The VINTAGE control can also detune and add density to a Unison patch.

The Unison button

To use Unison:

1. Press and hold the UNISON switch.
2. With the Unison switch held down, use the BANK/DECREMENT and TENS/INCREMENT switches to choose the number of voices to stack, then release the Unison switch.
3. To detune oscillators 2 and 3, use the PITCH knobs.

Using Chord Memory

Unison has another useful feature: chord memory. Instead of assigning voices to a single note, hold down a chord on the keyboard and press the Unison switch. The Trigon-6 memorizes the notes of the chord. Single notes played on the keyboard will then trigger all notes of the stored chord, transposing them as you play up or down the keyboard. Try using this feature to create powerful chord stabs and hits.

If you save a program that uses chord memory, the chord is saved with the program. “CHD” always appears as a choice if you step through voice stacking options using the BANKS/DECREMENT and TENS/INCREMENT buttons while holding down UNISON.

To use chord memory:

1. Hold down a chord on the keyboard (6 notes maximum).
2. Press the UNISON switch. The chord voicing is memorized. Play a few notes to listen to the result.
3. If you save the program, the unison chord memory is saved with it.

To exit Chord mode:

1. Hold UNISON.
2. Use the DEC button to deselect CHD.
3. Press the UNISON button.
4. Save the program again.

Key Assign Modes

Key Assign (sometimes called note priority) determines what note has priority when more than one note is played on the keyboard or via MIDI:

- Low-note priority (LO) is most common in vintage synths and is often used for playing trills by holding a note and repeatedly tapping a lower note.
- Low retrigger (LOr) causes the envelopes to be retriggered with each keystroke.
- High note (Hi) and high retrigger (Hir) are similar to the low note settings, except that the highest note is given priority.
- Last note (LAS) and last retrigger (LAr) give priority to the last note played.

To choose the Key Assign mode:

1. Press and hold KEY MODE in the MISC PARAMETERS section. The numeric display shows the currently selected mode.
2. To select a different mode, continue to hold down the KEY MODE switch then press the BANK/DECREMENT and TENS/INCREMENT switches to step through the other choices.
3. Release the KEY MODE switch when you're finished.

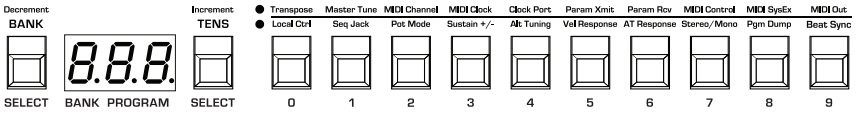
Key Assign settings affect polyphonic playback in the case that sustain/hold is on and a voice is stolen. In this case, key priority is always last.

Write

The WRITE button saves the currently active program. Saving a program overwrites a previously saved program.

The Trigon-6 contains a total of 1000 programs. 500 are permanent and 500 can be overwritten. Banks 0-4 are User Banks that can be overwritten. Banks 5-9 are Factory Banks that are permanent. You can edit the programs of either bank, but you can only save them to Banks 0-4. As shipped from the factory, presets 000-499 are identical to 500-999.

The Write button



Program bank, tens, and number selectors

To save a program to the same preset location:

1. Press the WRITE button. Its LED begins blinking.
2. Press a PROGRAM SELECTOR button (0-9) to specify the "ones" digit of the program.
3. The WRITE button LED stops blinking and the program is saved.

To save a program to a different bank location:

1. Press the WRITE button. Its LED begins blinking.
2. Hold down the BANK button then press a PROGRAM SELECTOR button (0-9) to specify the "hundreds" bank of the program. You can only save to Banks 0-4.
3. Hold down the TENS button then press a PROGRAM SELECTOR button (0-9) to specify the "tens" digit of the program.
4. Press a PROGRAM SELECTOR button (0-9) to specify the "ones" digit of the program.
5. The WRITE button LED stops blinking and the program is saved.

Canceling Save

Sometimes you may want to cancel saving a program before you commit.

To cancel the Save process before you commit:

- If the WRITE button LED is flashing, press it again. The LED stops flashing and saving is canceled. You can return to editing if you want.

Comparing Before You Save

Before writing a program to a new location, it's a good idea to listen to the program in the target location to make sure you really want to overwrite it.

To evaluate a program before you overwrite it:

1. Get ready to save by pressing the WRITE button. It starts flashing.
2. Press the GLOBAL button. Both LEDs on the button light up, indicating COMPARE mode.
3. Use the program buttons to navigate to the sound you want to compare and play the keyboard to hear the sound.

4. To disable the compare function and go back to the edited sound, turn off the GLOBAL button. Programs can't be written while in compare mode.

5. If you want to save the edited sound, the WRITE button is still flashing and ready to save, so enter a location with the program buttons. The sound is saved.

6. Alternatively, if you want to cancel saving and continue editing, press the WRITE button. It stops flashing and saving is canceled.

Globals

Global settings are parameters that affect all programs. These include settings such as Master Tune, MIDI Channel, MIDI Clock, and others. Global parameters are printed in two rows the program number switches (0 - 9). Press the Globals switch once to access the top row. Press it twice to access the bottom row. For details on the various Global parameters, see "" on page 1112.

The Globals button

To change a Global setting:

1. Press the GLOBALS button. Pressing it once accesses the top row of Global parameters. Pressing it twice accesses the bottom row of Global parameters. The LED indicates which row is active.

2. Press the PROGRAM SELECTOR button that corresponds to the Global parameter you want to change.

3. Use the BANK/DECREMENT and TENS/INCREMENT buttons to step through the available settings until you reach the one you want.

4. When finished, press GLOBALS again to exit.

Pressing the GLOBALS button three times in a row saves the current program as the default program that appears when you turn on the Trigon-6.

Preset

The PRESET switch toggles “live panel” mode on and off. In live panel mode the Trigon-6 ignores the currently active preset and reverts to the current front-panel settings of its knobs and switches. In other words, what you see on the front panel is what you hear. This is a great mode for learning, experimentation, and instant gratification.

The Preset button

To enter live panel mode:

- Press the PRESET button to toggle it off. The Trigon-6 is now in live panel mode. What you see on the front panel is what you hear. Note that you can’t change programs or banks with Preset off.

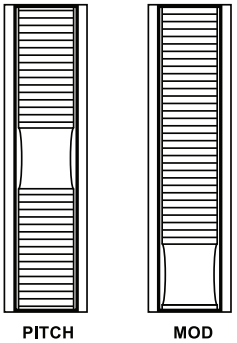
To return to preset mode:

- Press the PRESET button again to toggle it on. The LED is lit. The current program is what you hear.

Pitch and Mod Wheels

The Trigon-6 has a spring loaded Pitch wheel and a Mod wheel. You can use these controls to enhance live performance by bending notes and adding modulation in real time as you play.

In the same way that guitar players use note bends and vibrato to give their playing expressiveness and character, these two controls can really help you define your sound as a performer and take you beyond just playing notes on the keyboard.



The Pitch and Modulation wheels

Pitch Wheel

You can set a range in semitones for the Pitch wheel, depending on your playing preference. The range is up to 12 semitones (1 octave). Many musicians use a range of 2 semitones (a whole step) since this is the bend range of many acoustic instruments. For guitar whammy bar effects, you many wish to set a wider range.

To set the pitch bend range:

1. In the Miscellaneous Parameters section, press and hold the P WHL RANGE button.
2. With the button still held down, use the BANK/DECREMENT and TENS/INCREMENT switches to choose the number of semitones (up to 12) for the pitch bend range, then release the P WHL RANGE button.

Modulation Wheel

The Mod wheel controls the amount of modulation applied to any destinations chosen in the LFO section. This allows you to "perform" LFO modulation in real time by moving the Mod wheel. This is a great way to add expressiveness to a sound or performance.

To choose a modulation destination for the Mod wheel:

1. In the LFO section, choose a modulation destination as well as a SHAPE and FREQUENCY for the LFO. (See "Low Frequency Oscillator" on page 31 for more details.)

2. To apply modulation only when using the Mod wheel, set the INITIAL AMT knob to zero. (Turing this knob up will apply LFO modulation continuously — not just when the Mod wheel is used.)

Many programs use the Mod wheel to add vibrato. In this case, Freq 1 and Freq 2 are enabled as modulation destinations in the LOW-FREQUENCY OSCILLATOR section. This adds vibrato when you push the mod wheel forward. Set the INITIAL AMT knob to zero to apply vibrato only when using the Mod wheel.

Aftertouch

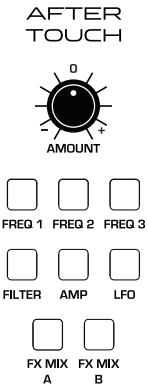
Aftertouch is a performance feature that allows you to add modulation to a sound by applying additional pressure to a key after the key is already down. The greater the pressure applied, the more modulation is applied. The Trigon-6 provides *monophonic* (or "channel") aftertouch, which means that applying pressure to any key within a chord will apply modulation to *all* notes currently held.

The Aftertouch section lets you choose the amount of modulation applied using aftertouch and which parameters are modulated (oscillator frequency, filter cutoff, etc.). You can set either a positive or negative amount.

For example, if you select the Low-Pass Filter as destination (FILTER), set a *positive* amount of aftertouch, then press the keys harder, the filter cutoff frequency will increase, making the filter open wider and the sound become brighter.

Conversely, if you select the Low-Pass Filter as destination (FILTER), set a *negative* amount of aftertouch, then press the keys harder, the filter cutoff frequency will be lowered, making the filter close more and the sound become more muted.

The Trigon-6 provides 8 different aftertouch response settings for your convenience. The default setting provides a linear response. To choose a different response curve, use the AT RESPONSE button in the GLOBALS section. See page 16 for more details.



The Aftertouch controls

Amount: Selects the amount of aftertouch applied to an active destination. Positive AMOUNT settings apply positive amounts of modulation. Negative AMOUNT settings apply negative amounts of modulation.

Freq 1: Selects Oscillator 1 frequency as an aftertouch modulation destination. With a positive AMOUNT setting, pressing the keys harder will shift the Oscillator 1 pitch upward. With a negative AMOUNT setting, pressing the keys harder will shift the Oscillator 1 pitch downward.

Freq 2: Selects Oscillator 2 frequency as an aftertouch modulation destination.

Freq 3: Selects Oscillator 3 frequency as an aftertouch modulation destination.

Filter: Selects the Filter cutoff frequency as a modulation destination. With a positive AMOUNT setting, pressing the keys harder will open the filter wider and make a sound become brighter. With a negative AMOUNT setting, pressing the keys harder will close the filter more and make a sound more muted.

Amp: Selects Amplitude as an aftertouch modulation destination. With a positive AMOUNT setting, pressing the keys harder will increase the volume of a sound. With a negative AMOUNT setting, pressing the keys harder will decrease the volume of a sound.

LFO : Selects the LFO AMOUNT parameter as an aftertouch modulation destination. With a positive AMOUNT setting, pressing the keys harder will increase the amount of LFO modulation to any destination selected in the LFO section. With a negative AMOUNT setting, pressing the keys harder will decrease the amount of LFO modulation — with the LFO waveform inverted.

FX Mix A : Selects the EFFECTS A DRY<>WET parameter as an aftertouch modulation destination. With a positive AMOUNT setting, pressing the keys harder will increase the amount of Effect A's WET mix. With a negative AMOUNT setting, pressing the keys harder will decrease the level of Effect A's WET mix.

FX Mix B : Selects the EFFECTS B DRY<>WET parameter as an aftertouch modulation destination. With a positive AMOUNT setting, pressing the keys harder will increase the amount of Effect B's WET mix. With a negative AMOUNT setting, pressing the keys harder will decrease the level of WET mix.

Exporting Programs and Banks

You can use the PGM DUMP command in the GLOBALS section to transmit the current program, bank, or all banks in SysEx format via the selected MIDI port. This allows you to save your programs so that you can share them or archive them.

To export a program or bank as a SysEx file over MIDI:

1. Press the GLOBALS button once (this enables the upper set of parameters) then press program selector 8 to select the MIDI SYSEX command.
2. Use the BANK/DECREMENT and TENS/INCREMENT buttons to select the appropriate MIDI port — MIDI (MID) or USB (usb).
3. Press GLOBALS a second time (this enables the lower set of parameters) then press program selector 8 to select the PGM DUMP command. The WRITE button begins flashing.
4. Use the BANK/DECREMENT and TENS/INCREMENT buttons to select the desired option — program (PRO), tens (ten), bank (ban), user banks (USR), all (all).
5. Press WRITE. The program or bank is exported.

Dumped programs will load back into the same bank and program location in memory when received by the Trigon-6 via MIDI.

Calibrating the Trigon-6

The Trigon-6 is calibrated at the factory. Controls such as the pitch and mod wheels shouldn't require re-calibration. However, because its oscillators and filters are voltage controlled and can be affected by extremes of temperature, you may need to use the built-in calibration function to tune them occasionally.

How and When to Calibrate the Oscillators and Filters

The first time you use the Trigon-6, please run its built-in oscillator and filter calibration procedure. Let it warm up for several minutes and come to its normal operating temperature before doing so.

Repeat the calibration procedure as needed over the next few days of use. The Trigon-6 learns the range of temperatures at your location and will keep itself in tune over this range.

A good rule of thumb is to cover the main temperature ranges as the Trigon-6 heats up. Calibrate several minutes after powering on, at about 30 minutes, and at about 1 hour.

Later, if you use the Trigon-6 in a different environment that is measurably warmer or cooler (on stage, in an air-conditioned studio, and so on) run the calibration procedure again.

To calibrate the oscillators and filters:

1. Hold down the PRESET button and press 0.
2. The front panel LEDs and display begin flashing as the Trigon-6 performs its auto-calibration procedure.
3. When finished, the front panel controls will return to normal and you can play the Trigon-6 again.

Calibrating the Pitch and Mod Wheels

In general, the Pitch and Mod wheels shouldn't require re-calibration. However, if you experience what seems like a persistent problem with either of them, the Trigon-6 has built-in auto-calibration procedure that you can use to remedy the problem.

To calibrate the Pitch and Mod wheel's low position:

1. Rotate and hold both wheels in their low position.
2. Hold down the PRESET button and press 7.

To calibrate the Pitch wheel's center position:

- With the Pitch wheel centered, hold down the PRESET button and press 8.

To calibrate the Pitch and Mod wheel's high position:

1. Rotate and hold both wheels in their high position.
2. Hold down the PRESET button and press 9.

Resetting the Global Parameters

If you're trying to track down a problem, it's sometimes a good idea to reset the Global parameters to their defaults. This is a quick way to make sure that the Trigon-6 returns to its factory settings.

To reset all Global parameters to their default settings:

- Hold down the GLOBAL button and press WRITE.
- The main display will show rst to indicate a successful reset.

Using USB

The Trigon-6'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 Trigon-6 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 Trigon-6 transmits and receives MIDI data via USB, but does not transmit audio.

MIDI In and USB should not be used at the same time, as overlapping messages from different sources may cause the Trigon-6 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, "Trigon-6 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 Trigon-6 is connected via USB, the "Found new hardware" alert appears and it is automatically installed as "Trigon-6 Keyboard."

In Windows, if you unplug the USB cable and plug it back in while a program has the Trigon-6 port open, you may have to resync. That usually means going to the Trigon-6 Keyboard Properties — in the Windows Device Manager under "Sound, video, and game controllers" — and clicking OK. If *Trigon-6 Keyboard* is no longer listed in the Device Manager, power the Trigon-6 down and back up again while it is connected via USB. It should be detected on power up.

Support

Troubleshooting

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

The sequencer or arpeggiator has stopped running.
Check the Clock settings (Global button 3) to ensure the Trigon-6 is set to Out or, if set to In, make sure the Trigon-6 is receiving MIDI clock.

Some of the programs sound different than before.
Check the Mod Wheel position. The Mod Wheel can do a lot more than just add vibrato. Also, check the Clock settings (Global button 3) to ensure the Trigon-6 is set to Out or, if set to In, make sure the Trigon-6 is receiving MIDI clock.

Sometimes after updating the OS or loading sound banks, you may need to reset the global parameters. This resets all background globals back to factory default state. To do this, hold the GLOBALS button and press the WRITE button. Note that this does not affect or change any of your saved presets.

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 Trigon-6. Or use MIDI, which is opto-isolated.

The Trigon-6 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 Trigon-6'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 Trigon-6 is being overrun with duplicate messages.

MIDI System Exclusive data is not being transmitted/received.
Check the SysEx settings to make sure the correct port is selected (MID,USB) using Global button 8.

The Trigon-6 plays out of tune.
Check Master Tune (Global button 1). If it seems correct, calibrate the oscillators and filters.

To calibrate the oscillators and filters:

3. Hold down the PRESET button and press 0.
4. The front panel LEDs and display begin flashing as the Trigon-6 performs its auto-calibration procedure. Don't turn off the power while it's doing this.
5. When finished, the front panel controls will return to normal and you can play the Trigon-6 again.


It is not usually necessary to run the calibration routine on a regular basis. You should only run it if you are experiencing problems, or have brought the Trigon-6 into a new environment (on a stage with hot stage lights, for example).

Recovering from a Failed OS Udate

In very rare cases, the Trigon-6 OS might fail to load correctly when you update. There is now a safe and easy way to recover in such situations. The Trigon-6 is now equipped with a MIDI boot loader, which will allow you to reload the OS in the event the you accidentally "brick" your synth (permanently freeze it) while updating its OS.

To restore your Trigon-6 if it is frozen.

1. Power on the Trigon-6 while holding the WRITE switch to enter boot loader mode. You'll see an animation in the main display.
2. Use a MIDI cable (not USB) to transmit the new OS to your synth. You must use a standard MIDI cable for this. USB MIDI doesn't work in boot loader mode.
3. As the OS loads, you will see the main display count backwards from 999. When it gets to 0, another countdown will begin between the main display and the EFFECTS parameter 1 display. Do not power down until this countdown has finished. The Trigon-6 will restart itself when it is done.

If your Trigon-6 is currently equipped with OS 1.2 (which is included with Trigon-6 serial numbers #2415 and later) you cannot downgrade to an OS version earlier than 1.2. If you try, your Trigon-6 will freeze. If this happens, you can enter recovery mode by holding the WRITE button while powering up as described above. You can then update your synth to the latest OS via MIDI DIN (not USB).

Contacting Technical Support

If you are still having a problem with the Trigon-6, contact Technical Support at support@sequential.com. Please include your Trigon-6's serial number, the version of the operating system (displayed on startup), and the purchase date.

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

Sequential warrants that the Trigon-6 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.sequential.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@sequential.com to determine the best course of action for getting your Trigon-6 repaired. For your own protection, as well as ours, please do not return any product to Sequential 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 Trigon-6'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 Sequential. 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.

Appendix A: Alternative Tunings

By default, the Trigon-6 is set to standard, chromatic western tuning. Additionally, it supports up to 63 additional alternative tunings, which you can access using the ALT TUNINGS parameter in the GLOBAL menu.

These 64 alternative tunings range from Equal temperament to Indonesian Gamelan tunings. If you want, you can replace these with other tunings that you can find on the Internet. These must be in SysEx format. You can download them into the Trigon-6 using SysEx Librarian for Mac or MIDI-OX for Windows.

Here are descriptions of the default Trigon-6 alternative tunings:

1. 12-Tone Equal Temperament (non-erasable)

The default Western tuning, based on the twelfth root of two.

2. Harmonic Series

MIDI notes 36-95 reflect harmonics 2 through 60 based on the fundamental of A = 27.5 Hz. The low C on a standard 5 octave keyboard acts as the root note (55Hz), and the harmonics play upwards from there. The remaining keys above and below the 5 octave range are filled with the same intervals as Carlos' Harmonic 12 Tone that follows.

3. Carlos Harmonic Twelve Tone

Wendy Carlos' twelve note scale based on octave-repeating harmonics. A = 1/1 (440 Hz). 1/1 17/16 9/8 19/16 5/4 21/16 11/8 3/2 13/8 27/16 7/4 15/8

4. Meantone Temperament

An early tempered tuning, with better thirds than 12ET. Sounds best in the key of C. Use this to add an authentic touch to performances of early Baroque music. C=1/1 (260 Hz)

5. 1/4 Tone Equal Temperament

24 notes per octave, equally spaced 24root2 intervals. Mexican composer Julian Carillo used this for custom-built pianos in the early 20th century.

6. 19 Tone Equal Temperament

19 notes per octave (19root2) offering better thirds than 12 ET, a better overall compromise if you can figure out the keyboard patterns.

7. 31 Tone Equal Temperament

Many people consider 31root2 to offer the best compromise towards just intonation in an equal temperament, but it can get very tricky to keep track of the intervals.

8. Pythagorean C

One of the earliest tuning systems known from history, the Pythagorean scale is constructed from an upward series of pure fifths (3/2) transposed down into a single octave. The tuning works well for monophonic melodies against fifth drones, but has a very narrow palate of good chords to choose from. C=1/1 (261.625 Hz) 1/1 256/243 9/8 32/27 81/64 4/3 729/512 3/2 128/81 27/16 16/9 243/128

9. Just Intonation in A with 7-Limit Tritone at D#

A rather vanilla 5-limit small interval JI, except for a single 7/5 tritone at D#, which offers some nice possibilities for rotating around bluesy sevenths. A=1/1 (440 Hz) 1/1 16/15 9/8 6/5 5/4 7/5 3/2 8/5 5/3 9/5 15/8

10. 3-5 Lattice in A

A pure 3 and 5-limit tuning which resolves to very symmetrical derived relationships between notes. A=1/1 (440 Hz) 1/1 16/15 10/9 6/5 5/4 4/3 64/45 3/2 8/5 5/3 16/9 15/8

11. 3-7 Lattice in A

A pure 3 and 7-limit tuning which resolves to very symmetrical derived relationships between notes. Some of the intervals are very close together, offering several choices for the same nominal chords. A=1/1 (440 Hz) 1/1 9/8 8/7 7/6 9/7 21/16 4/3 3/2 32/21 12/7 7/4 63/32

12. Other Music 7-Limit Black Keys in C

Created by the group Other Music for their homemade gamelan, this offers a wide range of interesting chords and modes. C=1/1 (261.625 Hz) 1/1 15/14 9/8 7/6 5/4 4/3 7/5 3/2 14/9 5/3 7/4 15/8

13. Dan Schmidt Pelog/Slendro

Created for the Berkeley Gamelan group, this tuning fits an Indonesian-style heptatonic Pelog on the white keys and pentatonic Slendro on the black keys, with B and Bb acting as 1/1 for their respective modes. Note that some of the notes will have the same frequency. By tuning the 1/1 to 60 Hz, Dan found a creative way to incorporate the inevitable line hum into his scale. Bb, B = 1/1 (60 Hz) 1/1 1/1 9/8 7/6 5/4 4/3 11/8 3/2 3/2 7/4 7/4 15/8

14. Yamaha Just Major C

When Yamaha decided to put preset microtunings into their FM synth product line, they selected this and the following tuning as representative just intonations. As such, they became the de-facto introduction to JI for many people. Just Major gives preferential treatment to major thirds on the sharps, and a good fourth relative to the second. C= 1/1 (261.625) 1/1 16/15 9/8 6/5 5/4 4/3 45/32 3/2 8/5 5/3 16/9 15/8

15. Yamaha Just Minor C

Similar to Yamaha's preset Just Major, the Just Minor gives preferential treatment to minor thirds on the sharps, and has a good fifth relative to the second. C= 1/1 (261.625) 1/1 25/24 10/9 6/5 5/4 4/3 45/32 3/2 8/5 5/3 16/9 15/8

16. Harry Partch 11-Limit 43 Note Just Intonation

One of the pioneers of modern microtonal composition, Partch built a unique orchestra with this tuning during the first half of the 20th century, to perform his own compositions. The large number of intervals in this very dense scale offers a full vocabulary of expressive chords and complex key changes. The narrow spacing also allows fixed-pitched instruments like marimbas and organs to perform glissando-like passages. G = 1/1 (392 Hz, MIDI note 67)

1/1 81/80 33/32 21/20 16/15 12/11 11/10 10/9 9/8 8/7 7/6 32/27 6/5 11/9 5/4 14/11 9/7 21/16 4/3 27/20 11/8 7/5 10/7 16/11 40/27 3/2 32/21 14/9 11/7 8/5 18/11 5/3 27/16 12/7 7/4 16/9 9/5 20/11 11/6 15/8 40/21 64/33 160/81

17. Arabic 12-Tone

A 12-tone approximation of an Arabic scale, which appears in some electronic keyboards designed for use with Arabic music. Not a JI scale, nor equal tempered. These are the intervals in Cents relative to C:

60 = Cents 0

61 = Cents +151

62 = Cents +204

63 = Cents +294

64 = Cents +355

65 = Cents +498

66 = Cents +649

67 = Cents +702

68 = Cents +853

69 = Cents +906

70 = Cents +996

71 = Cents +1057

72 = Cents +1200

18. 12 Out of 19-tET Scale from Mandelbaum's Dissertation

An interesting non-just 12 tone scale that has some unusual relationships.

note 0=0

note 1=63

note 2=189

note 3=253

note 4=379

note 5=505

note 6=568

note 7=695

note 8=758

note 9=884

note 10=947

note 11=1074

note 12=1200

19. 12 Out of 31-tET, Meantone Eb-G#

note 0=0

note 1=77

note 2=194

note 3=310

note 4=387

note 5=503

note 6=581

note 7=697

note 8=774

note 9=890

note 10=1006

note 11=1084

note 12=1200

20. Terry Riley's Harp of New Albion scale, Inverse Malcolm's Monochord

Original 1/1 on C#, here it is set to C.

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +111.731285	Ratio: 16/15 (JUST)
62 = Cents +203.910002	Ratio: 9/8 (JUST)
63 = Cents +315.641287	Ratio: 6/5 (JUST)
64 = Cents +386.313714	Ratio: 5/4 (JUST)
65 = Cents +498.044999	Ratio: 4/3 (JUST)
66 = Cents +609.776284	Ratio: 64/45 (JUST)
67 = Cents +701.955001	Ratio: 3/2 (JUST)
68 = Cents +813.686286	Ratio: 8/5 (JUST)
69 = Cents +884.358713	Ratio: 5/3 (JUST)
70 = Cents +996.089998	Ratio: 16/9 (JUST)
71 = Cents +1088.268715	Ratio: 15/8 (JUST)
72 = Cents +1200.	Ratio: 2/1 (JUST)

21. Lute tuning of Giovanni Maria Artusi (1603). 1/4-comma w. Acc. 1/2-way Naturals

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +96.578	Ratio: 8607/8140
62 = Cents +193.157	Ratio: 2889/2584
63 = Cents +289.735	Ratio: 11687/9886
64 = Cents +386.313714	Ratio: 5/4 (JUST)
65 = Cents +503.422	Ratio: 5267/3938
66 = Cents +600.	Ratio: 11482/8119
67 = Cents +696.578	Ratio: 7876/5267
68 = Cents +793.157	Ratio: 14771/9342
69 = Cents +889.735	Ratio: 11718/7009
70 = Cents +986.314	Ratio: 17561/9934
71 = Cents +1082.892	Ratio: 18204/9739
72 = Cents +1200.	Ratio: 2/1 (JUST)

22. J.S. Bach "well temperament", Acc. to Jacob Breetvelt's Tuner

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +92.18	Ratio: 10472/9929
62 = Cents +200.	Ratio: 5252/4679
63 = Cents +296.09	Ratio: 11781/9929
64 = Cents +390.225	Ratio: 9638/7693
65 = Cents +500.	Ratio: 6793/5089
66 = Cents +590.225	Ratio: 45/32 (just)
67 = Cents +700.	Ratio: 10178/6793
68 = Cents +794.135	Ratio: 15708/9929
69 = Cents +895.1125	Ratio: 14857/8859
70 = Cents +998.045	Ratio: 12503/7025
71 = Cents +1090.225	Ratio: 18484/9847
72 = Cents +1200.	Ratio: 2/1 (JUST)

23. Bulgarian Bagpipe tuning, Empirically Measured.

0 = Cents 0.	Ratio: 1/1 (JUST)
1 = Cents +66.	Ratio: 5427/5224
2 = Cents +202.	Ratio: 1925/1713
3 = Cents +316.	Ratio: 11586/9653
4 = Cents +399.	Ratio: 4965/3943
5 = Cents +509.	Ratio: 7451/5553
6 = Cents +640.	Ratio: 13435/9283
7 = Cents +706.	Ratio: 857/570
8 = Cents +803.	Ratio: 2681/1686
9 = Cents +910.	Ratio: 12130/7171
10 = Cents +1011.	Ratio: 1205/672
11 = Cents +1092.	Ratio: 12599/6705
12 = Cents +1200.	Ratio: 2/1 (JUST)

24. Wendy Carlos' Alpha Scale with Perfect Fifth Divided in Nine. 19 Tone cycle

Octaves are stretched, and the tuning is quite microtonal.

0 = Cents 0.	Ratio: 1/1 (JUST)
1 = Cents +78.	Ratio: 7241/6922
2 = Cents +156.	Ratio: 8994/8219
3 = Cents +234.	Ratio: 10686/9335
4 = Cents +312.	Ratio: 11873/9915
5 = Cents +390.	Ratio: 11636/9289
6 = Cents +468.	Ratio: 13024/9939
7 = Cents +546.	Ratio: 12433/9070
8 = Cents +624.	Ratio: 11605/8093
9 = Cents +702.	Ratio: 14999/9999
10 = Cents +780.	Ratio: 3471/2212
11 = Cents +858.	Ratio: 15361/9358
12 = Cents +936.	Ratio: 11467/6678
13 = Cents +1014.	Ratio: 17889/9959
14 = Cents +1092.	Ratio: 12599/6705
15 = Cents +1170.	Ratio: 18593/9459
16 = Cents +1248.	Ratio: 14957/7274
17 = Cents +1326.	Ratio: 8049/3742
18 = Cents +1404.	Ratio: 9617/4274
19 = Cents +1482.	Ratio: 1111/472

25. Wendy Carlos' Beta Scale with Perfect Fifth Divided by Eleven. 23-Tone Cycle

Octaves are stretched, and the tuning is quite microtonal (First repeat shown.)

0 = Cents 0.	Ratio: 1/1 (JUST)
1 = Cents +63.8	Ratio: 6191/5967
2 = Cents +127.6	Ratio: 9725/9034
3 = Cents +191.4	Ratio: 7739/6929
4 = Cents +255.2	Ratio: 8821/7612
5 = Cents +319.	Ratio: 7636/6351
6 = Cents +382.8	Ratio: 11690/9371
7 = Cents +446.6	Ratio: 9007/6959
8 = Cents +510.4	Ratio: 1500/1117
9 = Cents +574.2	Ratio: 13547/9723
10 = Cents +638.	Ratio: 12529/8667
11 = Cents +701.8	Ratio: 5584/3723
12 = Cents +765.6	Ratio: 9281/5964
13 = Cents +829.4	Ratio: 15760/9761
14 = Cents +893.2	Ratio: 1047/625
15 = Cents +957.	Ratio: 9629/5540
16 = Cents +1020.8	Ratio: 16551/9178
17 = Cents +1084.6	Ratio: 16263/8692
18 = Cents +1148.4	Ratio: 13585/6998
19 = Cents +1212.2	Ratio: 17231/8555
20 = Cents +1276.	Ratio: 12503/5983
21 = Cents +1339.8	Ratio: 10583/4881
22 = Cents +1403.6	Ratio: 12564/5585
23 = Cents +1467.4	Ratio: 8727/3739

26. Wendy Carlos' Gamma Scale with Third Divided by Eleven or Fifth by Twenty. 36 Tone

Octaves are stretched, and the tuning is quite microtonal.

0 = Cents 0.	Ratio: 1/1 (JUST)
1 = Cents +35.099	Ratio: 1146/1123
2 = Cents +70.198	Ratio: 7449/7153
3 = Cents +105.297	Ratio: 4118/3875
4 = Cents +140.396	Ratio: 475/438
5 = Cents +175.495	Ratio: 5363/4846
6 = Cents +210.594	Ratio: 3990/3533
7 = Cents +245.693	Ratio: 11307/9811
8 = Cents +280.792	Ratio: 4495/3822
9 = Cents +315.891	Ratio: 9707/8088
10 = Cents +350.99	Ratio: 1989/1624
11 = Cents +386.089	Ratio: 1926/1541
12 = Cents +421.188	Ratio: 7321/5740
13 = Cents +456.287	Ratio: 2089/1605
14 = Cents +491.386	Ratio: 8563/6447
15 = Cents +526.485	Ratio: 6117/4513
16 = Cents +561.584	Ratio: 148/107
17 = Cents +596.683	Ratio: 2895/2051
18 = Cents +631.782	Ratio: 7627/5295
19 = Cents +666.881	Ratio: 13901/9457
20 = Cents +701.98	Ratio: 3/2 (just)
21 = Cents +737.079	Ratio: 5477/3578
22 = Cents +772.178	Ratio: 6981/4469
23 = Cents +807.277	Ratio: 14613/9167
24 = Cents +842.376	Ratio: 10660/6553
25 = Cents +877.475	Ratio: 1255/756
26 = Cents +912.574	Ratio: 3959/2337
27 = Cents +947.673	Ratio: 16513/9552
28 = Cents +982.772	Ratio: 15424/8743
29 = Cents +1017.871	Ratio: 7563/4201
30 = Cents +1052.97	Ratio: 7367/4010
31 = Cents +1088.069	Ratio: 11918/6357
32 = Cents +1123.168	Ratio: 13310/6957
33 = Cents +1158.267	Ratio: 17050/8733
34 = Cents +1193.366	Ratio: 14586/7321
35 = Cents +1228.465	Ratio: 13368/6575
36 = Cents +1263.564	Ratio: 1276/615

27. Carlos Super Just

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +104.95541	Ratio: 17/16 (JUST)
62 = Cents +203.910002	Ratio: 9/8 (JUST)
63 = Cents +315.641287	Ratio: 6/5 (JUST)
64 = Cents +386.313714	Ratio: 5/4 (JUST)
65 = Cents +498.044999	Ratio: 4/3 (JUST)
66 = Cents +551.317942	Ratio: 11/8 (JUST)
67 = Cents +701.955001	Ratio: 3/2 (JUST)
68 = Cents +840.527662	Ratio: 13/8 (JUST)
69 = Cents +884.358713	Ratio: 5/3 (JUST)
70 = Cents +968.825906	Ratio: 7/4 (JUST)
71 = Cents +1088.268715	Ratio: 15/8 (JUST)
72 = Cents +1200.	Ratio: 2/1 (JUST)

28. Jon Catler 24-tone JI from "Over and Under the 13 Limit"

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +53.272943	Ratio: 33/32 (JUST)
62 = Cents +111.731285	Ratio: 16/15 (JUST)
63 = Cents +203.910002	Ratio: 9/8 (JUST)
64 = Cents +231.174094	Ratio: 8/7 (JUST)
65 = Cents +266.870906	Ratio: 7/6 (JUST)
66 = Cents +315.641287	Ratio: 6/5 (JUST)
67 = Cents +342.905379	Ratio: 128/105
68 = Cents +359.472338	Ratio: 16/13 (JUST)
69 = Cents +386.313714	Ratio: 5/4 (JUST)
70 = Cents +470.780907	Ratio: 21/16 (JUST)
71 = Cents +498.044999	Ratio: 4/3 (JUST)
72 = Cents +551.317942	Ratio: 11/8 (JUST)
73 = Cents +590.223716	Ratio: 45/32 (JUST)
74 = Cents +648.682058	Ratio: 16/11 (JUST)
75 = Cents +701.955001	Ratio: 3/2 (JUST)
76 = Cents +813.686286	Ratio: 8/5 (JUST)
77 = Cents +840.527662	Ratio: 13/8 (JUST)
78 = Cents +884.358713	Ratio: 5/3 (JUST)
79 = Cents +905.865003	Ratio: 27/16 (JUST)
80 = Cents +968.825906	Ratio: 7/4 (JUST)
81 = Cents +996.089998	Ratio: 16/9 (JUST)
82 = Cents +1061.427339	Ratio: 24/13 (JUST)
83 = Cents +1088.268715	Ratio: 15/8 (JUST)
84 = Cents +1200.	Ratio: 2/1 (JUST)

29. John Chalmers JI-1, Based loosely on Wronski's and similar JI scales, May 2, 1997.

(Chalmer's book "Divisions of the Tetrachord" is a late 20th century masterwork, exploring the mathematical underpinnings of just tunings.)

6 0 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +104.95541	Ratio: 17/16 (JUST)
62 = Cents +203.910002	Ratio: 9/8 (JUST)
63 = Cents +297.513016	Ratio: 19/16 (JUST)
64 = Cents +386.313714	Ratio: 5/4 (JUST)
65 = Cents +498.044999	Ratio: 4/3 (JUST)
66 = Cents +603.000409	Ratio: 17/12 (JUST)
67 = Cents +701.955001	Ratio: 3/2 (JUST)
68 = Cents +795.558015	Ratio: 19/12 (JUST)
69 = Cents +884.358713	Ratio: 5/3 (JUST)
70 = Cents +999.468017	Ratio: 57/32 (JUST)
71 = Cents +1088.268715	Ratio: 15/8 (JUST)
72 = Cents +1200.	Ratio: 2/1 (JUST)

30. John Chalmers JI-3, 15 16 17 18 19 20 21 on 1/1, 15-20 on 3/2, May 2, 1997.

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +111.731285	Ratio: 16/15 (JUST)
62 = Cents +216.686695	Ratio: 17/15 (JUST)
63 = Cents +315.641287	Ratio: 6/5 (JUST)
64 = Cents +409.244301	Ratio: 19/15 (JUST)
65 = Cents +498.044999	Ratio: 4/3 (JUST)
66 = Cents +582.512193	Ratio: 7/5 (JUST)
67 = Cents +701.955001	Ratio: 3/2 (JUST)
68 = Cents +813.686286	Ratio: 8/5 (JUST)
69 = Cents +918.641696	Ratio: 17/10 (JUST)
70 = Cents +1017.596288	Ratio: 9/5 (JUST)
71 = Cents +1111.199302	Ratio: 19/10 (JUST)
72 = Cents +1200.	Ratio: 2/1 (JUST)

31. John Chalmers JI-4, 15 16 17 18 19 20 on 1/1, same on 4/3, + 16/15 on 16/9

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +111.731285	Ratio: 16/15 (JUST)
62 = Cents +216.686695	Ratio: 17/15 (JUST)
63 = Cents +315.641287	Ratio: 6/5 (JUST)
64 = Cents +409.244301	Ratio: 19/15 (JUST)
65 = Cents +498.044999	Ratio: 4/3 (JUST)
66 = Cents +609.776284	Ratio: 64/45 (JUST)
67 = Cents +714.731694	Ratio: 68/45 (JUST)
68 = Cents +813.686286	Ratio: 8/5 (JUST)
69 = Cents +907.289301	Ratio: 76/45 (JUST)
70 = Cents +996.089998	Ratio: 16/9 (JUST)
71 = Cents +1107.821284	Ratio: 256/135
72 = Cents +1200.	Ratio: 2/1 (JUST)

32. Chinese scale, 4th century

0 = Cents 0.	Ratio: 1/1 (JUST)
1 = Cents +99.2	Ratio: 3735/3527
2 = Cents +199.5	Ratio: 11126/9915
3 = Cents +296.7	Ratio: 9181/7735
4 = Cents +398.	Ratio: 10405/8268
5 = Cents +492.9	Ratio: 448/337
6 = Cents +595.2	Ratio: 11312/8021
7 = Cents +699.	Ratio: 6439/4300
8 = Cents +790.9	Ratio: 7578/4799
9 = Cents +896.1	Ratio: 15436/9199
10 = Cents +984.9	Ratio: 6357/3599
11 = Cents +1091.4	Ratio: 1591/847
12 = Cents +1200.	Ratio: 2/1 (JUST)

33. Chinese Lu scale by Huai Nan Zi, Han era. (P. Amiot 1780, Kurt Reinhard)

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +98.954592	Ratio: 18/17 (JUST)
62 = Cents +203.910002	Ratio: 9/8 (JUST)
63 = Cents +315.641287	Ratio: 6/5 (JUST)
64 = Cents +394.347297	Ratio: 54/43 (JUST)
65 = Cents +498.044999	Ratio: 4/3 (JUST)
66 = Cents +608.351986	Ratio: 27/19 (JUST)
67 = Cents +701.955001	Ratio: 3/2 (JUST)
68 = Cents +800.909593	Ratio: 27/17 (JUST)
69 = Cents +905.865003	Ratio: 27/16 (JUST)
70 = Cents +1017.596288	Ratio: 9/5 (JUST)
71 = Cents +1106.396986	Ratio: 36/19 (JUST)
72 = Cents +1200.	Ratio: 2/1 (JUST)

34. Colonna 1

Fabio Colonna lived in Naples, and published a treatise in 1618 called "La Sambuca Lincea", which included a description of the instrument by that name which he built on commission from Scipione Stella, who had had the opportunity in 1594 to examine Vincentino's "Archicembalo" — a 31-tone-per-octave (not equal-tempered) keyboard instrument.

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +70.672427	Ratio: 25/24 (JUST)
62 = Cents +182.403712	Ratio: 10/9 (JUST)
63 = Cents +287.359122	Ratio: 85/72 (JUST)
64 = Cents +386.313714	Ratio: 5/4 (JUST)
65 = Cents +498.044999	Ratio: 4/3 (JUST)
66 = Cents +568.717426	Ratio: 25/18 (JUST)
67 = Cents +701.955001	Ratio: 3/2 (JUST)
68 = Cents +733.721654	Ratio: 55/36 (JUST)
69 = Cents +884.358713	Ratio: 5/3 (JUST)
70 = Cents +989.314122	Ratio: 85/48 (JUST)
71 = Cents +1088.268715	Ratio: 15/8 (JUST)
72 = Cents +1200.	Ratio: 2/1 (JUST)

35. Colonna 2 - Second 12 Note Subset of the Colonna Scale

60 = Cents 0. Ratio: 1/1 (JUST)
61 = Cents +70.672427 Ratio: 25/24 (JUST)
62 = Cents +203.910002 Ratio: 9/8 (JUST)
63 = Cents +315.641287 Ratio: 6/5 (JUST)
64 = Cents +386.313714 Ratio: 5/4 (JUST)
65 = Cents +498.044999 Ratio: 4/3 (JUST)
66 = Cents +582.512193 Ratio: 7/5 (JUST)
67 = Cents +701.955001 Ratio: 3/2 (JUST)
68 = Cents +813.686286 Ratio: 8/5 (JUST)
69 = Cents +884.358713 Ratio: 5/3 (JUST)
70 = Cents +1017.596288 Ratio: 9/5 (JUST)
71 = Cents +1049.362941 Ratio: 11/6 (JUST)
72 = Cents +1200. Ratio: 2/1 (JUST)

36. Ivor Darreg's 19 ratios in 5-limit JI for his Megalyra Family

Darreg was one of the great modern theorists of just intonation.

60 = Cents 0. Ratio: 1/1 (JUST)
61 = Cents +70.672427 Ratio: 25/24 (JUST)
62 = Cents +111.731285 Ratio: 16/15 (JUST)
63 = Cents +182.403712 Ratio: 10/9 (JUST)
64 = Cents +203.910002 Ratio: 9/8 (JUST)
65 = Cents +274.582429 Ratio: 75/64 (JUST)
66 = Cents +315.641287 Ratio: 6/5 (JUST)
67 = Cents +386.313714 Ratio: 5/4 (JUST)
68 = Cents +498.044999 Ratio: 4/3 (JUST)
69 = Cents +590.223716 Ratio: 45/32 (JUST)
70 = Cents +609.776284 Ratio: 64/45 (JUST)
71 = Cents +701.955001 Ratio: 3/2 (JUST)
72 = Cents +772.627428 Ratio: 25/16 (JUST)
73 = Cents +813.686286 Ratio: 8/5 (JUST)
74 = Cents +884.358713 Ratio: 5/3 (JUST)
75 = Cents +905.865003 Ratio: 27/16 (JUST)
76 = Cents +976.537429 Ratio: 225/128
77 = Cents +1017.596288 Ratio: 9/5 (JUST)
78 = Cents +1088.268715 Ratio: 15/8 (JUST)
79 = Cents +1200. Ratio: 2/1 (JUST)

37. Dorian Diatonic Tonos

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +111.731285	Ratio: 16/15 (JUST)
62 = Cents +231.174094	Ratio: 8/7 (JUST)
63 = Cents +359.472338	Ratio: 16/13 (JUST)
64 = Cents +427.372572	Ratio: 32/25 (JUST)
65 = Cents +498.044999	Ratio: 4/3 (JUST)
66 = Cents +571.725653	Ratio: 32/23 (JUST)
67 = Cents +648.682058	Ratio: 16/11 (JUST)
68 = Cents +813.686286	Ratio: 8/5 (JUST)
69 = Cents +902.486984	Ratio: 32/19 (JUST)
70 = Cents +996.089998	Ratio: 16/9 (JUST)
71 = Cents +1095.04459	Ratio: 32/17 (JUST)
72 = Cents +1200.	Ratio: 2/1 (JUST)

38. Almost Equal 12-tone Subset of Duodenarium

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +92.178716	Ratio: 135/128
62 = Cents +203.910002	Ratio: 9/8 (JUST)
63 = Cents +296.088718	Ratio: 1215/1024
64 = Cents +405.866283	Ratio: 512/405
65 = Cents +498.044999	Ratio: 4/3 (JUST)
66 = Cents +609.776284	Ratio: 64/45 (JUST)
67 = Cents +701.955001	Ratio: 3/2 (JUST)
68 = Cents +794.133717	Ratio: 405/256
69 = Cents +903.911282	Ratio: 2048/1215
70 = Cents +998.043719	Ratio: 3645/2048
71 = Cents +1107.821284	Ratio: 256/135
72 = Cents +1200.	Ratio: 2/1 (JUST)

39. Ellis's Just Harmonium

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +111.731285	Ratio: 16/15 (JUST)
62 = Cents +203.910002	Ratio: 9/8 (JUST)
63 = Cents +315.641287	Ratio: 6/5 (JUST)
64 = Cents +386.313714	Ratio: 5/4 (JUST)
65 = Cents +498.044999	Ratio: 4/3 (JUST)
66 = Cents +519.551289	Ratio: 27/20 (JUST)
67 = Cents +701.955001	Ratio: 3/2 (JUST)
68 = Cents +813.686286	Ratio: 8/5 (JUST)
69 = Cents +884.358713	Ratio: 5/3 (JUST)
70 = Cents +1017.596288	Ratio: 9/5 (JUST)
71 = Cents +1088.268715	Ratio: 15/8 (JUST)
72 = Cents +1200.	Ratio: 2/1 (JUST)

40. Bali/Java Slendro, Siam 7, empirical

0 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +111.731285	Ratio: 16/15 (JUST)
62 = Cents +203.910002	Ratio: 9/8 (JUST)
63 = Cents +315.641287	Ratio: 6/5 (JUST)
64 = Cents +386.313714	Ratio: 5/4 (JUST)
65 = Cents +498.044999	Ratio: 4/3 (JUST)
66 = Cents +519.551289	Ratio: 27/20 (JUST)
67 = Cents +701.955001	Ratio: 3/2 (JUST)
68 = Cents +813.686286	Ratio: 8/5 (JUST)
69 = Cents +884.358713	Ratio: 5/3 (JUST)
70 = Cents +1017.596288	Ratio: 9/5 (JUST)
71 = Cents +1088.268715	Ratio: 15/8 (JUST)
72 = Cents +1200.	Ratio: 2/1 (JUST)

41. Tibetian Ceremonial, empirical

0 = Cents 0.	Ratio: 1/1 (JUST)
1 = Cents +58.	Ratio: 2762/2671
2 = Cents +232.	Ratio: 6889/6025
3 = Cents +310.	Ratio: 10601/8863
4 = Cents +378.	Ratio: 11945/9602
5 = Cents +522.	Ratio: 849/628
6 = Cents +618.	Ratio: 483/338
7 = Cents +725.	Ratio: 605/398
8 = Cents +773.	Ratio: 13070/8363
9 = Cents +896.	Ratio: 14076/8389
10 = Cents +1019.	Ratio: 12585/6986
11 = Cents +1086.	Ratio: 16205/8654

42. Erlangen, revised

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +92.178716	Ratio: 135/128
62 = Cents +203.910002	Ratio: 9/8 (JUST)
63 = Cents +294.134997	Ratio: 32/27 (JUST)
64 = Cents +386.313714	Ratio: 5/4 (JUST)
65 = Cents +498.044999	Ratio: 4/3 (JUST)
66 = Cents +590.223716	Ratio: 45/32 (JUST)
67 = Cents +701.955001	Ratio: 3/2 (JUST)
68 = Cents +794.133717	Ratio: 405/256
69 = Cents +905.865003	Ratio: 27/16 (JUST)
70 = Cents +996.089998	Ratio: 16/9 (JUST)
71 = Cents +1088.268715	Ratio: 15/8 (JUST)
72 = Cents +1200.	Ratio: 2/1 (JUST)

43. Euler - Monochord (1739)

60 = Cents 0. Ratio: 1/1 (JUST)
61 = Cents +70.672427 Ratio: 25/24 (JUST)
62 = Cents +203.910002 Ratio: 9/8 (JUST)
63 = Cents +274.582429 Ratio: 75/64 (JUST)
64 = Cents +386.313714 Ratio: 5/4 (JUST)
65 = Cents +498.044999 Ratio: 4/3 (JUST)
66 = Cents +590.223716 Ratio: 45/32 (JUST)
67 = Cents +701.955001 Ratio: 3/2 (JUST)
68 = Cents +772.627428 Ratio: 25/16 (JUST)
69 = Cents +884.358713 Ratio: 5/3 (JUST)
70 = Cents +976.537429 Ratio: 225/128
71 = Cents +1088.268715 Ratio: 15/8 (JUST)
72 = Cents +1200. Ratio: 2/1 (JUST)

44. Fokker's 7-limit 12-tone Just Scale

60 = Cents 0. Ratio: 1/1 (JUST)
61 = Cents +119.442808 Ratio: 15/14 (JUST)
62 = Cents +203.910002 Ratio: 9/8 (JUST)
63 = Cents +266.870906 Ratio: 7/6 (JUST)
64 = Cents +386.313714 Ratio: 5/4 (JUST)
65 = Cents +498.044999 Ratio: 4/3 (JUST)
66 = Cents +590.223716 Ratio: 45/32 (JUST)
67 = Cents +701.955001 Ratio: 3/2 (JUST)
68 = Cents +821.397809 Ratio: 45/28 (JUST)
69 = Cents +884.358713 Ratio: 5/3 (JUST)
70 = Cents +968.825906 Ratio: 7/4 (JUST)
71 = Cents +1088.268715 Ratio: 15/8 (JUST)
72 = Cents +1200. Ratio: 2/1 (JUST)

45. Bagpipe tuning from Fortuna ("Try Key of G with F Natural")

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +29.849602	Ratio: 117/115
62 = Cents +187.681869	Ratio: 146/131
63 = Cents +256.596489	Ratio: 196/169
64 = Cents +343.090647	Ratio: 89/73 (JUST)
65 = Cents +493.957077	Ratio: 141/106
66 = Cents +548.648344	Ratio: 81/59 (JUST)
67 = Cents +684.728649	Ratio: 150/101
68 = Cents +729.878736	Ratio: 125/82 (JUST)
69 = Cents +871.94838	Ratio: 139/84 (JUST)
70 = Cents +985.798925	Ratio: 205/116
71 = Cents +1049.362941	Ratio: 11/6 (JUST)
72 = Cents +1200.	Ratio: 2/1 (JUST)

46. Gamelan Udan Mas (approx) s6,p6,p7,s1,p1,s2,p2,p3,s3,p4,s5,p5

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents 0.	Ratio: 1/1 (JUST)
62 = Cents +182.403712	Ratio: 10/9 (JUST)
63 = Cents +266.870906	Ratio: 7/6 (JUST)
64 = Cents +427.372572	Ratio: 32/25 (JUST)
65 = Cents +510.367002	Ratio: 47/35 (JUST)
66 = Cents +571.725653	Ratio: 32/23 (JUST)
67 = Cents +701.955001	Ratio: 3/2 (JUST)
68 = Cents +745.786052	Ratio: 20/13 (JUST)
69 = Cents +996.089998	Ratio: 16/9 (JUST)
70 = Cents +996.089998	Ratio: 16/9 (JUST)
71 = Cents +1126.319346	Ratio: 23/12 (JUST)
72 = Cents +1200.	Ratio: 2/1 (JUST)
73 = Cents +1200.	Ratio: 2/1 (JUST)

47. Kraig Grady's 7-limit "Centaur" Scale, 1987.

See Xenharmonikon 16.

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +84.467193	Ratio: 21/20 (JUST)
62 = Cents +203.910002	Ratio: 9/8 (JUST)
63 = Cents +266.870906	Ratio: 7/6 (JUST)
64 = Cents +386.313714	Ratio: 5/4 (JUST)
65 = Cents +498.044999	Ratio: 4/3 (JUST)
66 = Cents +582.512193	Ratio: 7/5 (JUST)
67 = Cents +701.955001	Ratio: 3/2 (JUST)
68 = Cents +764.915905	Ratio: 14/9 (JUST)
69 = Cents +884.358713	Ratio: 5/3 (JUST)
70 = Cents +968.825906	Ratio: 7/4 (JUST)
71 = Cents +1088.268715	Ratio: 15/8 (JUST)
72 = Cents +1200.	Ratio: 2/1 (JUST)

48. Harmonics 1 to 12 and Subharmonics Mixed

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +203.910002	Ratio: 9/8 (JUST)
62 = Cents +231.174094	Ratio: 8/7 (JUST)
63 = Cents +386.313714	Ratio: 5/4 (JUST)
64 = Cents +498.044999	Ratio: 4/3 (JUST)
65 = Cents +551.317942	Ratio: 11/8 (JUST)
66 = Cents +648.682058	Ratio: 16/11 (JUST)
67 = Cents +701.955001	Ratio: 3/2 (JUST)
68 = Cents +813.686286	Ratio: 8/5 (JUST)
69 = Cents +968.825906	Ratio: 7/4 (JUST)
70 = Cents +996.089998	Ratio: 16/9 (JUST)
71 = Cents +1200.	Ratio: 2/1 (JUST)

49. Michael Harrison, Piano Tuning for "Revelation" (2001)

Original 1/1=F, here it is set to C.

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents -27.264092	Ratio: 63/64 (JUST)
62 = Cents +203.910002	Ratio: 9/8 (JUST)
63 = Cents +176.64591	Ratio: 567/512
64 = Cents +407.820003	Ratio: 81/64 (JUST)
65 = Cents +470.780907	Ratio: 21/16 (JUST)
66 = Cents +611.730005	Ratio: 729/512
67 = Cents +701.955001	Ratio: 3/2 (JUST)
68 = Cents +674.690909	Ratio: 189/128
69 = Cents +905.865003	Ratio: 27/16 (JUST)
70 = Cents +968.825906	Ratio: 7/4 (JUST)
71 = Cents +1109.775004	Ratio: 243/128
72 = Cents +1200.	Ratio: 2/1 (JUST)

50. Helmholtz's two-keyboard Harmonium Tuning Untempered, 24 notes per octave

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +92.178716	Ratio: 135/128
62 = Cents +111.731285	Ratio: 16/15 (JUST)
63 = Cents +182.403712	Ratio: 10/9 (JUST)
64 = Cents +203.910002	Ratio: 9/8 (JUST)
65 = Cents +274.582429	Ratio: 75/64 (JUST)
66 = Cents +294.134997	Ratio: 32/27 (JUST)
67 = Cents +386.313714	Ratio: 5/4 (JUST)
68 = Cents +405.866283	Ratio: 512/405
69 = Cents +478.49243	Ratio: 675/512
70 = Cents +498.044999	Ratio: 4/3 (JUST)
71 = Cents +590.223716	Ratio: 45/32 (JUST)
72 = Cents +609.776284	Ratio: 64/45 (JUST)
73 = Cents +680.448711	Ratio: 40/27 (JUST)
74 = Cents +701.955001	Ratio: 3/2 (JUST)
75 = Cents +772.627428	Ratio: 25/16 (JUST)

76 = Cents +792.179997 Ratio: 128/81 (JUST)
77 = Cents +884.358713 Ratio: 5/3 (JUST)
78 = Cents +905.865003 Ratio: 27/16 (JUST)
79 = Cents +976.537429 Ratio: 225/128
80 = Cents +996.089998 Ratio: 16/9 (JUST)
81 = Cents +1088.268715 Ratio: 15/8 (JUST)
82 = Cents +1107.821284 Ratio: 256/135
83 = Cents +1178.49371 Ratio: 160/81 (JUST)
84 = Cents +1200. Ratio: 2/1 (JUST)

51. North Indian Gamut, Modern Hindustani 12 Selected from 22 or More Shrutis

60 = Cents 0. Ratio: 1/1 (JUST)
61 = Cents +111.731285 Ratio: 16/15 (JUST)
62 = Cents +203.910002 Ratio: 9/8 (JUST)
63 = Cents +315.641287 Ratio: 6/5 (JUST)
64 = Cents +386.313714 Ratio: 5/4 (JUST)
65 = Cents +498.044999 Ratio: 4/3 (JUST)
66 = Cents +590.223716 Ratio: 45/32 (JUST)
67 = Cents +701.955001 Ratio: 3/2 (JUST)
68 = Cents +813.686286 Ratio: 8/5 (JUST)
69 = Cents +905.865003 Ratio: 27/16 (JUST)
70 = Cents +1017.596288 Ratio: 9/5 (JUST)
71 = Cents +1088.268715 Ratio: 15/8 (JUST)
72 = Cents +1200. Ratio: 2/1 (JUST)

52. Carnatic Gamut. Kuppuswami: Carnatic Music and the Tamils, p. v

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +98.954592	Ratio: 18/17 (JUST)
62 = Cents +203.910002	Ratio: 9/8 (JUST)
63 = Cents +315.641287	Ratio: 6/5 (JUST)
64 = Cents +394.347297	Ratio: 54/43 (JUST)
65 = Cents +498.044999	Ratio: 4/3 (JUST)
66 = Cents +596.999591	Ratio: 24/17 (JUST)
67 = Cents +701.955001	Ratio: 3/2 (JUST)
68 = Cents +800.909593	Ratio: 27/17 (JUST)
69 = Cents +905.865003	Ratio: 27/16 (JUST)
70 = Cents +1017.596288	Ratio: 9/5 (JUST)
71 = Cents +1096.302298	Ratio: 81/43 (JUST)
72 = Cents +1200.	Ratio: 2/1 (JUST)

53. Observed South Indian Tuning of a vina, Ellis

Octaves are stretched.

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +97.	Ratio: 8644/8173
62 = Cents +195.	Ratio: 10974/9805
63 = Cents +312.	Ratio: 11873/9915
64 = Cents +397.	Ratio: 3372/2681
65 = Cents +515.	Ratio: 9782/7265
66 = Cents +596.	Ratio: 12731/9023
67 = Cents +692.	Ratio: 13439/9011
68 = Cents +782.	Ratio: 6031/3839
69 = Cents +883.	Ratio: 6793/4079
70 = Cents +997.	Ratio: 4863/2734
71 = Cents +1092.	Ratio: 12599/6705
72 = Cents +1207.	Ratio: 15117/7528

54. 7-limit 12-tone Scale

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +111.731285	Ratio: 16/15 (JUST)
62 = Cents +203.910002	Ratio: 9/8 (JUST)
63 = Cents +266.870906	Ratio: 7/6 (JUST)
64 = Cents +386.313714	Ratio: 5/4 (JUST)
65 = Cents +498.044999	Ratio: 4/3 (JUST)
66 = Cents +582.512193	Ratio: 7/5 (JUST)
67 = Cents +701.955001	Ratio: 3/2 (JUST)
68 = Cents +813.686286	Ratio: 8/5 (JUST)
69 = Cents +933.129094	Ratio: 12/7 (JUST)
70 = Cents +968.825906	Ratio: 7/4 (JUST)
71 = Cents +1088.268715	Ratio: 15/8 (JUST)
72 = Cents +1200.	Ratio: 2/1 (JUST)

55. Alternate 7-limit 12-tone Scale

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +70.672427	Ratio: 25/24 (JUST)
62 = Cents +182.403712	Ratio: 10/9 (JUST)
63 = Cents +266.870906	Ratio: 7/6 (JUST)
64 = Cents +386.313714	Ratio: 5/4 (JUST)
65 = Cents +470.780907	Ratio: 21/16 (JUST)
66 = Cents +582.512193	Ratio: 7/5 (JUST)
67 = Cents +701.955001	Ratio: 3/2 (JUST)
68 = Cents +813.686286	Ratio: 8/5 (JUST)
69 = Cents +933.129094	Ratio: 12/7 (JUST)
70 = Cents +968.825906	Ratio: 7/4 (JUST)
71 = Cents +1088.268715	Ratio: 15/8 (JUST)
72 = Cents +1200.	Ratio: 2/1 (JUST)

56. Kurzweil "Just with Natural b7th", is Sauveur Just with 7/4

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +70.672427	Ratio: 25/24 (JUST)
62 = Cents +203.910002	Ratio: 9/8 (JUST)
63 = Cents +315.641287	Ratio: 6/5 (JUST)
64 = Cents +386.313714	Ratio: 5/4 (JUST)
65 = Cents +498.044999	Ratio: 4/3 (JUST)
66 = Cents +590.223716	Ratio: 45/32 (JUST)
67 = Cents +701.955001	Ratio: 3/2 (JUST)
68 = Cents +813.686286	Ratio: 8/5 (JUST)
69 = Cents +884.358713	Ratio: 5/3 (JUST)
70 = Cents +968.825906	Ratio: 7/4 (JUST)
71 = Cents +1088.268715	Ratio: 15/8 (JUST)
72 = Cents +1200.	Ratio: 2/1 (JUST)

57. 3 and 7 prime rational interpretation of 17-tET

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +62.960904	Ratio: 28/27 (JUST)
62 = Cents +140.949098	Ratio: 243/224
63 = Cents +203.910002	Ratio: 9/8 (JUST)
64 = Cents +294.134997	Ratio: 32/27 (JUST)
65 = Cents +357.095901	Ratio: 896/729
66 = Cents +435.084095	Ratio: 9/7 (JUST)
67 = Cents +498.044999	Ratio: 4/3 (JUST)
68 = Cents +561.005903	Ratio: 112/81 (JUST)
69 = Cents +638.994097	Ratio: 81/56 (JUST)
70 = Cents +701.955001	Ratio: 3/2 (JUST)
71 = Cents +764.915905	Ratio: 14/9 (JUST)
72 = Cents +842.904099	Ratio: 729/448
73 = Cents +905.865003	Ratio: 27/16 (JUST)
74 = Cents +996.089998	Ratio: 16/9 (JUST)
75 = Cents +1059.050902	Ratio: 448/243
76 = Cents +1137.039096	Ratio: 27/14 (JUST)
77 = Cents +1200.	Ratio: 2/1 (JUST)

58. 11-limit 'prime row' from Ben Johnston's "6th Quartet".

Not octave repeating, with some very narrow intervals. These are the first 30 pitches:

0 = Cents 0.	Ratio: 1/1 (JUST)
1 = Cents +70.672427	Ratio: 25/24 (JUST)
2 = Cents +182.403712	Ratio: 10/9 (JUST)
3 = Cents +274.582429	Ratio: 75/64 (JUST)
4 = Cents +386.313714	Ratio: 5/4 (JUST)
5 = Cents +505.756522	Ratio: 75/56 (JUST)
6 = Cents +568.717426	Ratio: 25/18 (JUST)
7 = Cents +733.721654	Ratio: 55/36 (JUST)
8 = Cents +772.627428	Ratio: 25/16 (JUST)
9 = Cents +884.358713	Ratio: 5/3 (JUST)
10 = Cents +923.264486	Ratio: 75/44 (JUST)
11 = Cents +1088.268715	Ratio: 15/8 (JUST)
12 = Cents +1151.229619	Ratio: 35/18 (JUST)
13 = Cents +1221.902045	Ratio: 875/432
14 = Cents +1333.633331	Ratio: 175/81 (JUST)
15 = Cents +1425.812047	Ratio: 875/384
16 = Cents +1537.543332	Ratio: 175/72 (JUST)
17 = Cents +1656.986141	Ratio: 125/48 (JUST)
18 = Cents +1719.947045	Ratio: 875/324
19 = Cents +1884.951273	Ratio: 1925/648
20 = Cents +1923.857046	Ratio: 875/288
21 = Cents +2035.588332	Ratio: 175/54 (JUST)
22 = Cents +2074.494105	Ratio: 875/264
23 = Cents +2239.498333	Ratio: 175/48 (JUST)
24 = Cents +2302.459237	Ratio: 1225/324
25 = Cents +2373.131664	Ratio: 30625/7776
26 = Cents +2484.862949	Ratio: 6125/1458
27 = Cents +2577.041666	Ratio: 30625/6912
28 = Cents +2688.772951	Ratio: 6125/1296
29 = Cents +2808.215759	Ratio: 4375/864
30 = Cents +2871.176663	Ratio: 30625/5832

59. 1/9-Harrison's comma mean-tone scale

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +74.23293	Ratio: 8315/7966
62 = Cents +192.63798	Ratio: 6334/5667
63 = Cents +266.870906	Ratio: 7/6 (JUST)
64 = Cents +385.27596	Ratio: 6671/5340
65 = Cents +503.68101	Ratio: 13025/9737
66 = Cents +577.91394	Ratio: 2632/1885
67 = Cents +696.31899	Ratio: 14567/9743
68 = Cents +770.55192	Ratio: 9743/6243
69 = Cents +888.95697	Ratio: 1885/1128
70 = Cents +963.1899	Ratio: 13187/7560
71 = Cents +1081.59495	Ratio: 1780/953
72 = Cents +1200.	Ratio: 2/1 (JUST)

60. Rousseau's Monochord, Dictionnaire de musique (1768)

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +70.672427	Ratio: 25/24 (JUST)
62 = Cents +203.910002	Ratio: 9/8 (JUST)
63 = Cents +315.641287	Ratio: 6/5 (JUST)
64 = Cents +386.313714	Ratio: 5/4 (JUST)
65 = Cents +498.044999	Ratio: 4/3 (JUST)
66 = Cents +568.717426	Ratio: 25/18 (JUST)
67 = Cents +701.955001	Ratio: 3/2 (JUST)
68 = Cents +813.686286	Ratio: 8/5 (JUST)
69 = Cents +884.358713	Ratio: 5/3 (JUST)
70 = Cents +1017.596288	Ratio: 9/5 (JUST)
71 = Cents +1088.268715	Ratio: 15/8 (JUST)
72 = Cents +1200.	Ratio: 2/1 (JUST)

61. Persian santur tuning. 1/1=E in Original

Here it is set to C. Note that scale is 8 notes per octave, so it will not map normally to a 12 note keyboard.

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +129.99971	Ratio: 10727/9951
62 = Cents +345.	Ratio: 4710/3859
63 = Cents +490.00034	Ratio: 5797/4368
64 = Cents +630.00051	Ratio: 8153/5666
65 = Cents +849.99952	Ratio: 13952/8539
66 = Cents +1034.99975	Ratio: 20/11 (just)
67 = Cents +1137.00011	Ratio: 15866/8227
68 = Cents +1200.	Ratio: 2/1 (JUST)
69 = Cents +1329.99971	Ratio: 21454/9951
70 = Cents +1545.	Ratio: 18281/7489
71 = Cents +1690.00034	Ratio: 5797/2184
72 = Cents +1830.00051	Ratio: 28347/9850
73 = Cents +2049.99952	Ratio: 32211/9857
74 = Cents +2234.99975	Ratio: 36331/9991
75 = Cents +2337.00011	Ratio: 38073/9871
76 = Cents +2400.	Ratio: 4/1 (JUST)

62. Vallotti & Young (Vallotti Version)

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +94.135	Ratio: 10487/9932
62 = Cents +196.09	Ratio: 10851/9689
63 = Cents +298.045	Ratio: 4679/3939
64 = Cents +392.18	Ratio: 3843/3064
65 = Cents +501.955	Ratio: 5467/4091
66 = Cents +592.18	Ratio: 13863/9847
67 = Cents +698.045	Ratio: 8182/5467
68 = Cents +796.09	Ratio: 13019/8220
69 = Cents +894.135	Ratio: 2427/1448
70 = Cents +1000.	Ratio: 17189/9647
71 = Cents +1090.225	Ratio: 18484/9847
72 = Cents +1200.	Ratio: 2/1 (JUST)

63. LaMonte Young, Tuning of For Guitar '58. 1/1 March '92, inv.of Mersenne lute 1

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +111.731285	Ratio: 16/15 (JUST)
62 = Cents +182.403712	Ratio: 10/9 (JUST)
63 = Cents +315.641287	Ratio: 6/5 (JUST)
64 = Cents +386.313714	Ratio: 5/4 (JUST)
65 = Cents +498.044999	Ratio: 4/3 (JUST)
66 = Cents +590.223716	Ratio: 45/32 (JUST)
67 = Cents +701.955001	Ratio: 3/2 (JUST)
68 = Cents +813.686286	Ratio: 8/5 (JUST)
69 = Cents +884.358713	Ratio: 5/3 (JUST)
70 = Cents +1017.596288	Ratio: 9/5 (JUST)
71 = Cents +1088.268715	Ratio: 15/8 (JUST)
72 = Cents +1200.	Ratio: 2/1 (JUST)

64. LaMonte Young's Well-Tuned Piano

60 = Cents 0.	Ratio: 1/1 (JUST)
61 = Cents +176.64591	Ratio: 567/512
62 = Cents +203.910002	Ratio: 9/8 (JUST)
63 = Cents +239.606814	Ratio: 147/128
64 = Cents +470.780907	Ratio: 21/16 (JUST)
65 = Cents +443.516816	Ratio: 1323/1024
66 = Cents +674.690909	Ratio: 189/128
67 = Cents +701.955001	Ratio: 3/2 (JUST)
68 = Cents +737.651813	Ratio: 49/32 (JUST)
69 = Cents +968.825906	Ratio: 7/4 (JUST)
70 = Cents +941.561815	Ratio: 441/256
71 = Cents +1172.735908	Ratio: 63/32 (JUST)
72 = Cents +1200.	Ratio: 2/1 (JUST)

Appendix B: MIDI Implementation

The Trigon-6 receives MIDI data according to the settings you have chosen in the GLOBAL settings. In addition, there is interaction between some of the Program parameters that determine the overall response of Trigon-6 to MIDI data. Following are the Global parameters that affect response to MIDI:

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

MIDI Clock: Sets the Trigon-6's ability to send and receive MIDI clock messages:

- Off: MIDI Clock is neither sent nor received
- Out: MIDI Clock is sent, but not received
- In: MIDI Clock is received, but not sent
- Clock Thru (i-0): MIDI Clock is received and passed to MIDI Out
- In, No Start/Stop (n55): Receives MIDI Clock but does not respond to MIDI Start or Stop command.


When set to IN or IN THRU, if no MIDI clock is present at the selected input, the arpeggiator and sequencer will not function.

Clock Port: MID, USB—Sets the port(s), MIDI or USB, by which MIDI clock signals are received.

Param Xmit: Off, CC, NR—Changes to the values of front panel controls are transmitted via MIDI as Continuous Controllers (CC) or Non-registered Parameter Number (NR). Transmission of parameters can also be turned off.


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.

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

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

MIDI Sysex: MID, USB— When set to MIDI (MID) it will receive and transmit them using the MIDI ports/cables When set to USB it will receive and transmit them using the USB port/cable. MIDI SysEx messages are used when sending and receiving a variety of data including, programs, alternative tunings, system updates, and more.

MIDI Out: MID, USB, btH, PLY— Sets the port by which MIDI data will be transmitted (MIDI, USB, MIDI + USB, or Poly Chain)..

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, 0-99 for Programs 1-100 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	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	32	0vvvvvvv	Bank Select: 0 - 4 select user banks 0 - 4; 5 - 9 select factory banks 0 - 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, 0-99 for Programs 00-99 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 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	0010 0000	0vvvvvvv	Bank Select: 0 - 9
1011 nnnn	0100 0000	0vvvvvvv	Damper pedal: Sends 0 if off, 0111 1111 when on
1011 nnnn	0000 0111	0vvvvvvv	Volume knob

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

Additional Continuous Controllers Transmitted/Received

The following table details how MIDI Continuous Controllers (CCs) are mapped to Trigon-6 controls. They are transmitted when Param Xmit is set to CC, and recognized/received when MIDI Rcv Receive is set to CC.

CC#	Param
0	Bank Select MSB
1	Mod Wheel
3	BPM
4	Foot Controller
5	Glide Mode (Portamento Time)
6	Data Enttry MSB
7	MIDI Volume
9	Distortion Amount
11	Expression
12	Voice Volume
38	Data Entry LSB
40	VCA Env Amt
41	VCA Env Vel Amt
43	VCA Env Attack
44	VCA Env Decay
45	VCA Env Sustain
46	VCA Env Release
47	Filter Env Amt
50	Filter Env Attack
51	Filter Env Decay
52	Filter Env Sustain
53	Filter Env Release
58	Arp On/Off
59	Arp Mode
60	Arp Range
62	Clock Divide
65	Glide On/Off
67	Osc 1 Octave
68	Osc 1 Synch
69	Osc 1 Level
70	Osc 1 Saw On
71	Osc 1 Pulse Tri On

CC#	Param
72	Osc 1 Pulse On
73	Osc 1 Pulse Width
75	Osc 2 Octave
76	Osc 2 Freq Fine
77	Osc 2 Level
78	Osc 2 Saw On
79	Osc 2 Tri On
80	Osc 2 Pulse On
81	Osc 2 Pulse Width
82	Osc 3 Osctave
83	Osc 3 Freq Fine
84	Osc 3 Level
85	Osc 3 Saw On
86	Osc 3 Tri On
87	Osc 3 Pulse On
88	Osc 3 Pulse Width
89	Osc 3 Key On/Off
96	Data Inc
97	Data Dec
102	Lowpass Frequency
103	Lowpass Resonance
104	Lowpass Key Amount
105	Lowpass Velocity On
106	Lowpass Drive
107	Lowpass 2/4 Pole
120	All Sound Off
121	Reset Controllers
122	Local Control On/Off
123	All Notes Off
124	Omni Mode Off
125	Omni Mode On
126	Mono Mode On
127	Poly Mode On

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 an 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 an 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	Description
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 table shows the Global data sent and received on global parameter dumps, and corresponding NRPN number when sent/received individually.

NRPN	Range	Description
1024	0-100	Master Fine Tune
1025	0-24	Master Coarse 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 Port 0 = MIDI Port 1 = USB
1029	0-2	MIDI Param Send* 0 = NRPN 1 = CC 2= Off
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

NRPN	Range	Description
1033	0-3	MIDI Out Select 0 = Off 1 = MIDI 2 = USB 3 = MIDI+USB
1035	0-1	Local Control* 0 = Off 1 = On
1037	0-2	Pot Mode 0 = Relative 1= PassThru 2 = Jump
1039	0-3	Seq Jack 0 = normal 1= trigger 2= gate 3= trigger+gate
1040	0-3	Sustain Polarity 0 = normally open 1= normally closed 2= Sustain Normally Open/ Sequencer Normally Closed 3= Sustain Normally Closed/ Sequencer Normally Open
1041	0-3	Velocity Response
1042	0-3	Aftertouch Response
1043	0-1	Mono/Stereo 0 = Stereo 1 = Mono
1044	0-16	Alt Tuning

*Controller received, but not transmitted.

†Controller transmitted, but ignored when received.

Program Parameter Data

The following table lists Trigon-6's program parameters.

NRPN	Value	Description
0	0-4	Osc 1 Octave
1	0-4	Osc 2 Octave
2	0-5	Osc 3 Octave
3	0-1400	Osc 2 Pitch
4	0-1400	Osc 3 Pitch
5	0-1	Osc 1 Saw
6	0-1	Osc 2 Saw
7	0-1	Osc 3 Saw Fall
8	0-1	Osc 1 Tri
9	0-1	Osc 2 Tri
10	0-1	Osc 3 Tri
11	0-1	Osc 1 Square
12	0-1	Osc 2 Square
13	0-1	Osc 3 Square
14	0-127	Osc 1 PW
15	0-127	Osc 2 PW
16	0-127	Osc 3 PW
17	0-127	Osc 1 Volume
18	0-127	Osc 2 Volume
19	0-127	Osc 3 Volume
20	0-1	Osc 1 Sync
21	0-1	Osc 1 Keyboard
23	0-127	Glide Rate
24	0-3	Glide Mode
25	0-1	Glide On/Off
26	0-12	Pitch Wheel Range
27	0-127	Vintage
29	0-164	Filter Cutoff
30	0-127	Filter Resonance
31	0-2	Filter Keyboard
32	0-1	FEnv Velocity
33	0-1	Filter 2-Pole

NRPN	Value	Description
34	0-100	Program Volume
35	0-127	Pan Spread
36	0-254	FEnv Amount
40	0-127	FEnv Atatck
41	0-127	VCA Attack
42	0-127	FEnv Decay
43	0-127	VCA Decay
44	0-127	FEnv Sustain
45	0-127	VCA Sustain
46	0-127	FEnv Release
47	0-127	VCA Release
48	0-1	VCA Velocity
49	0-9	FX A Type
50	0-13	FX B Type
51	0-1	FX On/Off
53	0-127	FX A Wet/Dry
54	0-127	FX B Wet/Dry
55	0-127	FX A Param 1
56	0-127	FX B Param 1
57	0-127	FX A Param 2
58	0-127	FX B Param 2
59	0-1	FX A Sync On/Off
60	0-1	FX B Sync On/Off
63	0-127	Distortion
64	0-254	LFO Freq
66	0-1	LFO Sync On/Off
68	0-255	LFO Amount
69	0-1	LFO Osc 1 Freq Dest
70	0-1	LFO Osc 2 Freq Dest
71	0-1	LFO Osc 3 Freq Dest

NRPN	Value	Description
72	0-1	LFO PW 1 Dest
73	0-1	LFO PW 2 Dest
74	0-1	LFO PW 3 Dest
75	0-1	LFO Filter Dest
76	0-1	LFO Amp Dest
77	0-254	Aftertouch Amount
78	0-1	Touch Osc 1 Freq Dest
79	0-1	Touch Osd 2 Freq Dest
80	0-1	Touch Osc 3 Freq Dest
81	0-1	Touch Filter Dest
82	0-1	Touch Amp Dest
83	0-1	Touch Amp LFO
84	0-1	Touch FX A Mix
85	0-1	Touch FX B Mix
86	0-254	Polymod FEnv Amt
87	0-254	Polymod Osc 3 Amt
88	0-1	Polymod Osc 1 Freq Dest
89	0-1	Polymod Osc 2 Freq Dest
90	0-1	Polymod Osc 3 Freq Dest
91	0-1	Polymod PW 1 Dest
92	0-1	Polymod PW 2 Dest
93	0-1	Polymod Feedback Dest
94	0-1	Polymod Filter Dest
95	0-1	Unison On/Off
96	0-6	Unison Voice Count
97	0-5	Key Mode
98	30-250	BPM
100	0-4	Arp Mode
101	0-2	Arp Octave
102	0-1	Arp On/Off
103	0-9	Clock Divide

NRPN	Value	Description
104	0-1	Arp Hold
105	0-1	Sequencer On/Off
106	0-1	Sequencer Rec On
137-200	0-127	Seq Step 1-64 Vel 3
201-264	12-108	Seq Step 1-64 Note 4
265-328	0-127	Seq Step 1-64 Vel 4
329-392	12-108	Seq Step 1-64 Note 5
393-456	0-127	Seq Step 1-64 Vel 5
457-520	12-108	Seq Step 1-64 Note 6
521-584	0-127	Seq Step 1-64 Vel 6
1024	0-100	Tuning Fine
1025	0-24	Tuning Coarse
1026	0-16	MIDI Channel
1027	0-4	MIDI Clock
1028	0-1	MIDI Clock Port
1029	0-2	MIDI Param Send
1030	0-2	MIDI Param Receive
1031	0-1	MIDI MIDI Control
1032	0-1	MIDI SysEx Control
1033	0-1	MIDI Out
1035	0-1	Local Control
1037	0-2	Pot Mode
1039	0-3	Seq Jack
1040	0-3	Sustain Polarity
1041	0-3	Velocity Response
1042	0-3	At Response
1043	0-1	Stereo Mono
1044	0-16	Alt Tuning

Control NRPN Data

The following table lists the Trigon-6's control NRPN data. It is received and transmitted but not saved as part of a program.

NRPN	Value	Description
1088	0-1	Seq Play/Stop *
1	0-1	Osc 1 Sync
2	0-127	Osc 1 Level
3	0-254	Osc 1 Shape

*Only available in NORMAL Seq jack mode.

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 Trigon-6 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 1101	Trigon-6 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 1101	Trigon-6 ID
0000 0101	Request Program Transmit
0000 00vv	Bank Number, 0 - 9
0vvv vvvv	Program Number, 0 - 99
1111 0111	End of Exclusive (EOX)

The Trigon-6 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 1101	Trigon-6 ID
0000 0110	Request Program Edit Buffer Transmit
1111 0111	End of Exclusive (EOX)

The Trigon-6 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 1101	Trigon-6 ID
0000 1110	Request Global Parameter Transmit
1111 0111	End of Exclusive (EOX)

The Trigon-6 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 1101	Trigon-6 ID
0000 0010	Program Data
0000 00vv	Bank Number: 0 - 9
0vvv vvvv	Program Number: 0 - 99
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	- ID
0010 1101	Trigon-6 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 1101	Trigon-6 ID
0000 1111	Main Parameter Data
0vvv vvvv	50 nibbles (LS then MS) for 25 Global parameters
1111 0111	End of Exclusive (EOX)

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.

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