TETR4

Operation Manual

Dave Smith

INSTRUMENTS

Tetra

Operation Manual

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Tested To Comply
With FCC Standards
FOR OFFICE USE

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

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

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

For Technical Support, email: support@davesmithinstruments.com

Contents

Quick Start

Thanks for purchasing your Tetra synthesizer! Listen to the sounds, twiddle some knobs, have some fun!

Please Register!

Please go to www.davesmithinstruments.com and register your synth. If you purchased directly from us, there is no need to register — we already have your contact information.

Powering Up

So, plug in the power supply, connect (in stereo!) to your mixer/sound system, and start playing!

You can use the PUSH IT switch to trigger sounds without a keyboard. If you're using a MIDI keyboard, try applying keyboard pressure (aftertouch) and the mod wheel. Many sounds are fairly simple at first, and then come alive when you use the controllers. With other sounds, you may need to hold the notes a while to let the sound unfold. Playing in different ways has a big effect on the programs.

Selecting and Editing Programs, Combos, and Global Settings

Use SELECT or the increment and decrement (+ and -) switches to step through the programs. Hold the switches down briefly to increment or decrement the bank. There are 4 banks of 128 programs. Banks 1 and 2 are the Prophet '08 factory programs.

If you want to edit a program, just turn any knob. The new value will be displayed in the bottom line of the LCD (the top line displays the programmed value for handy reference).

After turning knobs, just press the Mode (PROGRAM/COMBO/GLOBAL) switch to exit Edit Mode and return to Program Mode, allowing you to change programs again.

While in Program Mode, press the Mode switch again to change to Combo Mode. Combos contain a combination of four different programs—one per voice—that can be used to play polyphonically or in unison, or to play four different sequences simultaneously.

Press and hold the Mode switch briefly to display the Global menu and change higher level parameters such as MIDI channel number, Transpose/Detune, and so on. The SELECT knob changes the displayed page and increment and

decrement change the values. These settings are remembered when the synth is turned off.

Summary

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

Don't forget you get a free editor for Mac OS or Windows with your purchase. Download it from www.soundtower.com/tetra.

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

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

Have fun!

Dave Smith

Special thanks to:

Tim Ande, Dave Polich, Ravi Sharma, James Terris, Stefan Trippler, and Jason Ware for their voicing work. Thanks also to the authors of the Prophet '08 programs, many of which are used in Tetra. Finally, the DSI Team: Chris Hector, Andrew McGowan, Joanne McGowan, and Tracy Wadley.

Getting Connected

Tetra has several inputs and outputs on its back panel.

Power Input — Connect the power supply included with your Tetra. The power supply comes with different AC adaptor prongs that allow it to work anywhere in the world. If for whatever reason you need to use a different supply, it must match the specifications printed on the front panel.

> **Note**: The power supply label says “Evolver” on it; we use the same supply for the mono Evolvers, Mophos, and the Prophets.

USB — Tetra transmits and receives MIDI data via this standard, Type B, USB receptacle.

MIDI In — To receive MIDI data from another device, connect this to the other device's MIDI Out.

MIDI Out — To send MIDI data to another device, connect this to the other device's MIDI In. This output can also be configured as a MIDI Thru using the MIDI Out Select parameter in the Global menu.

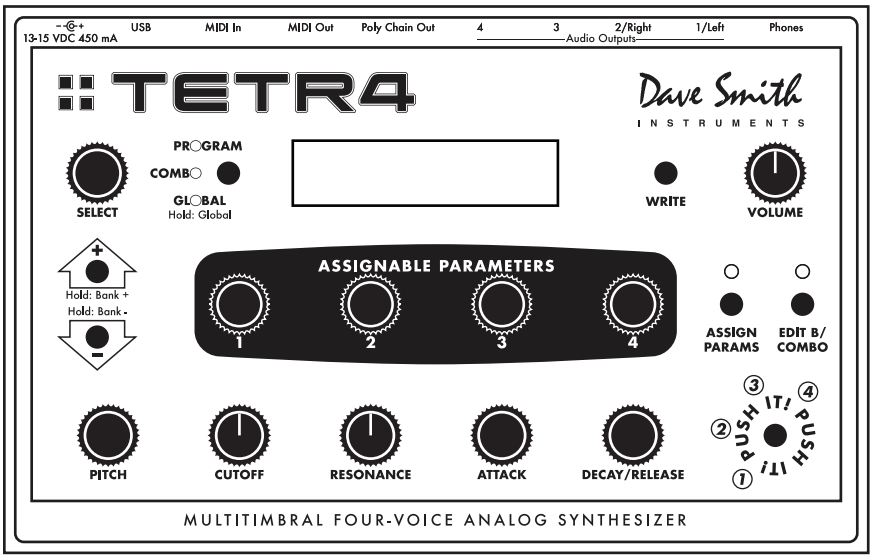
Poly Chain Out — Up to four Tetras can be chained for increased polyphony and multiple Tetras can be poly chained with a Prophet ’08 or Mopho Keyboard. For details, see *Using Poly Chain* on page 36.

> **Note:** When Poly Chain is turned off in the Global menu, the Poly Chain Out simply mirrors the MIDI Out and transmits the same data.

Audio Outputs — Tetra has four, unbalanced, ¼ inch outputs. 1/Left and 2/Right are the summed outputs of all four voices in Stereo or Mono mode and are typically used for “normal” polyphonic or unison playing. They are also the direct outputs of voices 1 and 2 in Quad mode. Outputs 3 and 4 are the direct outputs of voices 3 and 4, respectively, and are always mono. The individual, direct outputs are typically used in Multi Mode or Combo Mode, so that each voice can be mixed and processed separately. For more about the Audio Out and Multi Mode parameters, see *Global Parameters* on page 13.

Phones — A ¼ inch stereo headphone jack.

Front Panel Controls



Select — Use SELECT to change and scroll through programs and combos. When ASSIGN PARAMS is on, SELECT changes the value of the current parameter. Also used to select parameters in Global mode.

Mode (Program/Combo/Global) — Tetra has four modes of operation: program, combo, global, and edit. Press the button to toggle between Program and Combo Mode.

When in Program Mode, the display shows the name, number, and bank of the current program. Editing any of the parameters puts Tetra into Edit Mode and displays the last parameter edited and its stored and edited values. To return to Program Mode, simply press the mode switch. See *Program Parameters* starting on page 17 for more information.

In Combo Mode, the display shows the name and number of the current combo. Editing any of the parameters puts Tetra into Edit Mode and displays the voice (V1, V2, V3, or V4) being edited, the last parameter edited and its edited value. To return to Combo Mode, simply press the mode switch. See *Combos* on page 33 for more information.

Global mode is accessed by briefly holding down the mode button. The Global menu is displayed. Use SELECT to scroll the Global menu and the increment and decrement (+ and -) buttons to change the settings. To return to Program or Combo Mode, simply press the mode button. See *Global Parameters* on page 13 for more information.

Write — Use WRITE to save an edited program or combo to any of Tetra's memory locations. To execute the write operation, press the increment (+) button.

To store a program or combo in a different location, press the WRITE button and change the destination using the SELECT knob before executing the write.

> **Note:** You can also change program banks by holding the increment (+) and decrement (-) buttons, but be careful! If you hit the increment button quickly, it saves the program wherever you are at that point. If you want to change banks, just be sure to hold the button until you see the bank change.

To cancel a write, press WRITE, decrement (-), or the mode button. WRITE is also used to execute certain operations in the Global menu.

Volume — The master volume control for all of Tetra's audio outputs and the headphone output.

Increment/Decrement — The increment and decrement (+ and -) controls are used to step through programs in Program Mode, combos in Combo Mode, to change values in the Global menu, and to confirm or cancel various operations. In Edit Mode they increase/decrease the parameter value. They are also used to select Tetra's four program banks. Hold increment briefly to switch to the next highest bank; hold decrement to switch to the next lowest bank.

Assignable Parameters 1-4 — Any of Tetra's program parameters can be edited from the front panel using the ASSIGNABLE PARAMETERS controls and the assignments for the controls are saved per program, to best suit that program. In other words, the assignments for the controls can be completely different from one program to another.

In Combo Mode, each of the four controls is routed to the respective voice. That is, parameter 1 controls an assigned parameter for voice 1, parameter 2 controls voice 2, etc.

See also *Edit B/Combo* below for more information.

Assign Parameters — When the ASSIGN PARAMETERS LED is lit, turn any of the ASSIGNABLE PARAMETERS controls to select from the list of program parameters. Press ASSIGN PARAMETERS again (turn the LED off) to use the ASSIGNABLE PARAMETERS controls to edit the selected parameters. For a description of the parameters, see *Program Parameters* beginning on page 17. For a list of the parameters, see page 44.

Alternately, with ASSIGN PARAMETERS on, choose a parameter to edit with any of the ASSIGNABLE PARAMETERS controls, and change the parameter's value using SELECT or the increment (+) or decrement (-) buttons.

Edit B/Combo — This button behaves differently depending upon the current mode. In Program Mode, it switches between program layers. Each program has two layers, A and B. Each layer can be a complete, separate patch. The layers are used in conjunction with the KeyMode parameter for creating stacked or split programs. When EDIT B/COMBO is active, the front panel controls the B layer.

> **Note:** The ASSIGNABLE PARAMETERS are the same for both layers.

In Combo Mode, EDIT B/COMBO is used to access various combo parameters. Press EDIT B/COMBO once to edit voice 1 parameters. Press the button repeatedly to cycle through the voices and exit Edit Mode. See *Combos* on page 33 for more information.

> **Note:** In Combo Mode or when Multi Mode is turned on in the Global menu, a program's B layer is ignored.

Pitch — Controls the base frequency of the oscillators. The relative interval between the two oscillators is in each voice is maintained, even when the extremes are reached.

Cutoff — Controls the filter cutoff.

Resonance — Controls filter resonance.

> **Note:** The filter will only self oscillate when in 4-pole mode. See *Low-pass Filter Parameters* on page 19 for more information.

Attack — Simultaneously adjusts the attack portion of all envelope generators: filter, amplifier, and Envelope 3.

Decay/Release — Simultaneously adjusts the decay and release portions of all envelope generators: filter, amplifier, and Envelope 3.

Push It! — The PUSH IT button is a manual trigger to play Tetra. In Program Mode, it can trigger a specific note (at a specific velocity) or a gated sequence, latch notes or sequences on and off, and manually step through a sequence. For more information, see *Program Parameters*, beginning on page 17.

In Combo Mode, the PUSH IT button cycles through the voices for polyphonic combos and plays all voices simultaneously when unison is on. See *Combos* on page 33 for more information.

Basic Operation

Tetra has multiple personalities. It is a four-voice, analog poly synth, a sort of "mini Prophet." But the voice architecture is based on Mopho, so it has a couple of sonic tricks up its sleeve—specifically sub-octave generators and feedback—that are absent from the Prophet. Tetra is also a four-part, multitimbral synth with separate outputs, essentially four Mophos in one *very* compact box. And it's a voice expander for other Tetras or for a Prophet '08. (Program banks 1 and 2 are the Prophet '08 factory programs.)

In designing Tetra, the goal was to make a great sounding synth that was also affordable. Toward that end, we wanted to give players enough control over parameters to make it useful for performance, so we came up with a combination of "hard-wired" commonly used controls and user-assignable controls. Any of Tetra's parameters can be edited in real time from the front panel controls. But we also recognize that may not be the quickest or easiest way to program sounds from scratch. A free editor for Mac OS and Windows gives you easy access to all of Tetra's program parameters. Download it here: www.soundtower.com/tetra. Also, an advanced version of the editor with more features can be purchased from our Web site.

> **Note:** The Prophet '08's controls map directly to Tetra's, so if you have a Prophet '08, you can use it as a MIDI control surface for Tetra.

Programs

When Tetra first powers up, it is in Program Mode. The top line of the LCD shows the Program (1…128) and Bank (1…4) number of the currently selected program, and the bottom line shows the 16-character name of the program. SELECT changes the program. The program can also be changed by pressing the increment (+) or decrement (-) switches. To increment to the next bank, hold the increment switch briefly; to decrement to the previous bank, hold the decrement switch.

To edit a program, simply turn any knob. The ASSIGNABLE PARAMETERS knobs have been preset to useful parameters for the factory programs. To change a knob's assignment, press ASSIGN PARAMETERS to light the LED. Turning any of the ASSIGNABLE PARAMETERS knobs now will scroll through the list of available parameters. Choose one or more parameters to edit and then press ASSIGN PARAMETERS again to exit the assignment mode (ASSIGN PARAMETERS LED should now be off). Alternately, turn ASSIGN PARAMETERS on, use any of the ASSIGNABLE PARAMETERS knobs to choose a parameter, and change the value with SELECT or the increment (+) and decrement (-) buttons. See *Program Parameters* on page 17 for a detailed list of all parameters and their functions. After editing parameters, press the Mode (PROGRAM/COMBO/GLOBAL) switch to exit Edit Mode and return to Program Mode.

Combos

When in Program Mode, press the Mode switch to enter Combo Mode. Combos are combinations of four programs, one for each voice. In Combo Mode, use SELECT and increment/decrement to change combos. Each of the ASSIGNABLE PARAMETERS knobs controls a parameter for its respective voice: knob 1 for voice 1, knob 2 for voice 2, and so on. And the bottom row of knobs affects all voices and programs in the combo. For more about combos, see *Combos* on page 33.

Saving a Program or Combo

To save a program or combo, press WRITE. To store in a different location, use SELECT to choose the target destination, and hold the increment or decrement switch to choose a different bank (programs only; there is only one bank of combos). Press increment (+) to complete the write operation or decrement (-) to cancel (or press WRITE again).

Voice Architecture and Feedback

As you can see from the illustration on the following page, the left Audio Output goes through a programmable-gain pre-amp (controlled by the Feedback Gain parameter), then through a VCA for feedback volume control, and then to the filter input. Turning up the Feedback Volume will cause varying amounts of the audio output to be mixed back in pre-filter, individually per voice. For most purposes, small amounts of feedback are most useful and the resulting effect is similar to an overdrive distortion. Higher levels of feedback can get very squirrelly and rude (which may be exactly the effect you're looking for).

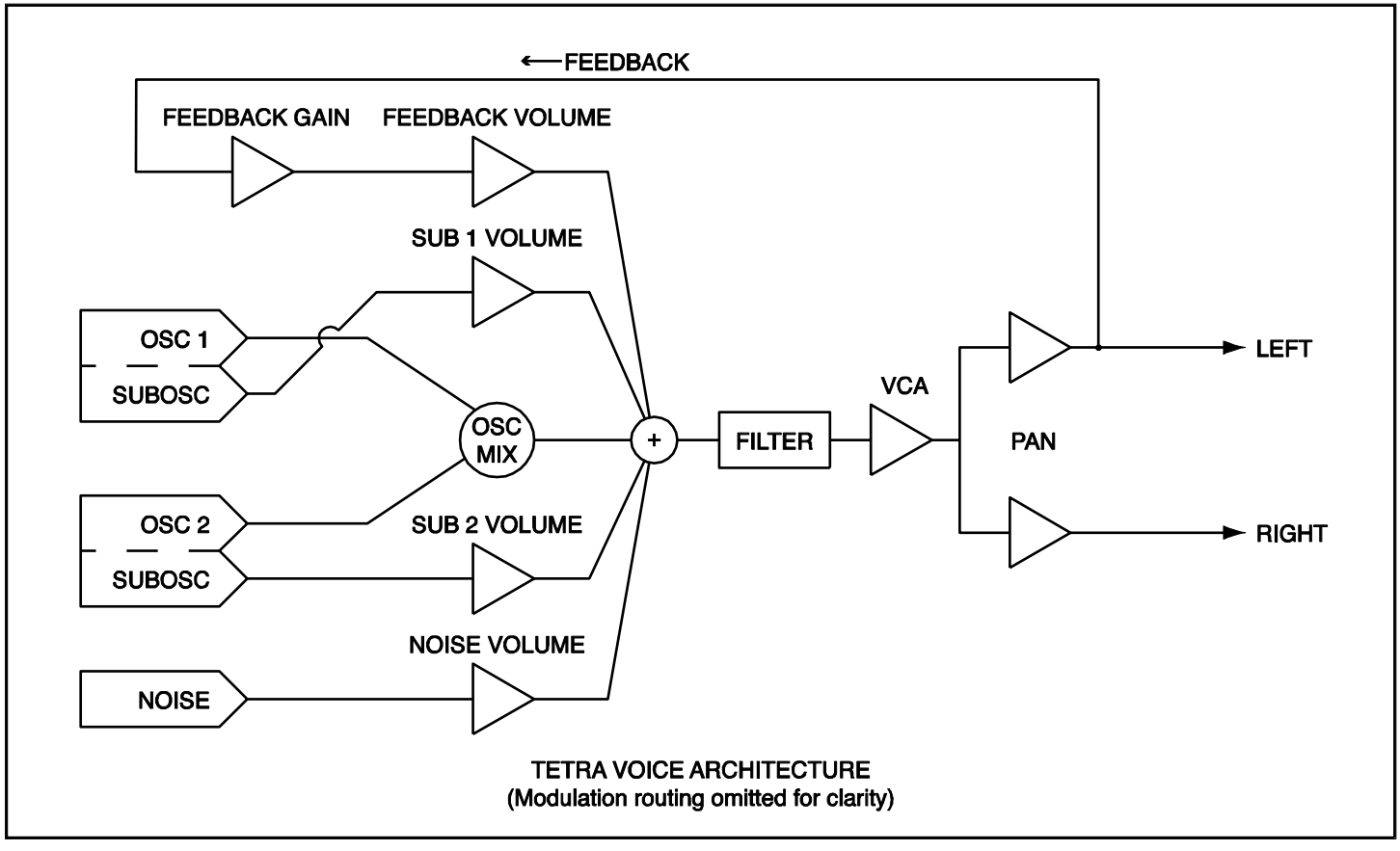
FEEDBACK GAIN also affects the level of the feedback signal, so you'll typically want to start with FEEDBACK GAIN turned down.

Several of the factory programs already have some level of feedback programmed in, as often indicated by the letters "FB" following the name. To hear the effect of Feedback Volume and Feedback Gain, call up one of those programs and vary those parameters.

Further Reading

For information about using Tetra multitimbrally, see "Multi Mode" and "Audio Out" in *Global Parameters* on page 13.

For information about using Tetra as a voice expander with a Prophet '08 or another Tetra, or using Mopho as an additional voice for Tetra, see *Using Poly Chain* on page 36.



TETRA VOICE ARCHITECTURE
(Modulation routing omitted for clarity)

Global Parameters

Tetra's Global parameters affect all programs globally. Examples include MIDI channel and fine tune. To edit the Global parameters, hold down the Mode switch (Program/Combo/Global) until the GLOBAL LED lights. The SELECT knob changes the global parameter and the increment and decrement buttons change the value.

Transpose: -12…+12 — Master Transpose control, 0 is centered. Steps in semitones.

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

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

Clock: see table — Selects the MIDI clock status.

Display	MIDI Clock Setting
Internal	MIDI clock is neither sent nor received
V1 Master	Voice 1 provides the master clock for all 4 voices when in Combo mode.
MIDI Out	MIDI clock is sent
MIDI In	MIDI clock is received
Midi In/Out	MIDI clock is received and transmitted

MIDI Parameter Send: NRPN, CC, Off — Changes to the values of Tetra's front panel controls are transmitted via MIDI as Non-registered Parameter Number (NRPN) controllers or as Continuous Controllers (CC). Transmission of parameters can also be turned off. See *MIDI Implementation* on page 45 for details.

> **Note:** NRPNs are the preferred method of parameter transmission, since they cover the complete range of all parameters, while CCs only handle the main parameters.

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

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

MIDI SysEx: Off, On — When On, the synth will respond to received MIDI SysEx messages, and will transmit them, when prompted, to the MIDI Out. See *Sysex Messages* on page 62 for details.

MIDI Out Select: Out, Thru — MIDI Out can be switched to MIDI Thru to daisychain multiple MIDI devices.

Poly Chain: Off, Out 1, Out 4, Out 8, Out 12, In End, InOut4, InOut8 — Using Poly Chain, up to four Tetras can be chained together for increased polyphony. One or two Tetras can also be chained with a Prophet '08 for twelve- or sixteen-note polyphony. And a Tetra and Mopho can be chained for five-note polyphony. For a more complete description of Poly Chain and how to use it, see *Using Poly Chain* on page 36.

Multi Mode: Off, On — Multi Mode enables Tetra to respond to four separate MIDI channels for multitimbral playback. With Multi Mode on, voice one responds to the base MIDI channel and the other three voices respond to the next three consecutive channels. For example, if Tetra's base channel setting is 3, voice one responds to MIDI channel 3, voice two to MIDI channel 4, and so on.

> **Note:** For all four voices to play in Multi Mode, the base channel must be 13 or lower.

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

Mode Lock: Off, Prog, Combo — Prevents Tetra from being switched from Program mode to Combo mode or vice versa. This prevents the loss of unsaved edits caused by unintentional mode changes.

Audio Out: Stereo, Mono, Quad, Q LR34 — Tetra has four audio outputs: 1/Left, 2/Right, 3, and 4. Stereo operation is the default. When set to Stereo, a stereo mix of all voices is available via the Left and Right outputs.

> **Note:** Outputs 3 and 4 are always direct outputs for voices 3 and 4 and are mono, regardless of the Audio Out mode. Inserting a plug into output 3 or 4 does not remove that voice from the mix outputs when in Stereo or Mono mode.

When set to Mono, this parameter defeats all pan settings and modulation, effectively making each of the Left and Right outputs a mono output.

Quad directs each of the four voices to its respective, mono output.

Note: Outputs 3 and 4 are noticeably louder than the other two outputs. This is normal. Outputs 3 and 4 are always monophonic and, therefore, do not require as much headroom as the mix outputs, which have to accommodate up to four voices at one time without distorting. The higher level provides optimum signal-to-noise ratio. Compensate for differences in level with a mixer.

Choosing "Q LR34" is similar to Quad, but voices 1 and 2 retain whatever panning effects are present in the assigned programs and the stereo outputs of those voices are present at both the Left and Right outputs.

PotMode: Relative, Passthru, Jump –Tetra's Cutoff, Resonance, and Volume controls are potentiometers or "pots." There are three pot modes to determine how the synth reacts when the programmable parameters—Cutoff and Resonance—are edited. (Master volume is not programmable, so these modes don't apply.)

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

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

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

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

Balance V 1 - 4: -14…+14 **—** Adjusts the left/right balance of each voice by approximately +/- 4 dB.

Basic Patch — Press the WRITE button to load a basic patch into the edit buffer. (The patch will not actually be written to the current program location unless intentionally written to memory in Program Mode using the WRITE button.)

Reset Globals — Tetra does not have a full hardware reset, but select this parameter and press WRITE to reset the global parameters to their factory defaults.

MIDI SysEx Dump: see table **—** Allows dumping of programs and combos in SysEx format via MIDI.

Display	Data to be dumped to SysEx
Current Program	Dump current program
Current Prog Bank	Dump all 128 programs in current bank
All Progrm Banks	Dump all programs in all 4 banks
Current Combo	Dump current combo
Combo Bank	Dump all combos
All Progs Combos	Dump all program banks and combos
Current Prog P08	Dump current program in Prophet '08 format
CurrentProgMopho	Dump current program in Mopho format
Program Bank P08	Dump current bank in Prophet '08 format
Prog Bank Mopho	Dump current bank in Mopho format

Press the WRITE switch to start transmission. This feature is handy for saving Programs on a computer in SysEx format, or for sending them to another Tetra via a direct MIDI connection. The dumps include Program and Bank numbers, so when received, the programs will be stored in the same location.

Programs can also be exported in Mopho and Prophet '08 formats. Features/parameters not available on those instruments are stripped out. For example, Mopho does not support layers, so only layer A is exported. The Prophet '08 does not have feedback or sub-octave generators.

Program Copy Utility — Enables layer A or layer B of a program to be copied to layer A or B of the same or a different program. The top line displays the current bank and program. Use increment (+) or decrement (-) to choose the layer to be copied. Then use SELECT to select the destination bank, program, and layer and increment/decrement to change the values.

Program Parameters

All Program parameters can be edited using any of ASSIGNABLE PARAMETERS controls. To assign a parameter to a control, press the ASSIGN PARAMETERS button to light the LED, and then turn any of the knobs (1 through 4) to select a parameter. A full list of the parameters can be found on page 44. The selected parameter and value appear in the LCD display. The top line of the LCD displays the programmed value for reference; the bottom line displays the edited value.

To then change the value of the parameter you selected, hit the ASSIGN PARAMETERS button again, and the same knob will now change the value. You can also use the increment and decrement switches to adjust parameter values.

> **Note**: Once you are done editing a program, before you save it, you should consider what parameters you want to access when playing the new program. Generally, when making a program, we try to assign each of the 4 knobs to a different parameter that makes sense for that particular program, providing extra live control.

Though it is certainly possible to perform detailed program generation and editing using these controls, it is usually much faster to use the free editor available for Mac OS or Windows. The minimal front panel of the Tetra is designed for fast, real-time changes in live performance.

Following are descriptions of each Tetra Program parameter.

Oscillator Parameters

Tetra has two analog oscillators per voice. The basic controls for each oscillator are the same.

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

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

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

Shape: see table — Selects the oscillator waveshape as follows:

Display	Waveshape
Osc Off	No output
Sawtooth	Sawtooth
Triangle	Triangle
Saw-Tri	Sawtooth — Triangle mix
Pulse xx	Pulse Wave, with pulse width ranging from minimum (0) to maximum (99). The pulse width will turn off at the two extremes — this allows some interesting modulation possibilities. A square wave will be at Pulse 50.

Glide: 0…127 — Sets the oscillator glide (portamento) rate. Glide can be set independently for each oscillator. Low values are faster. See "Glide Mode" below in *Miscellaneous Oscillator Parameters* for additional Glide settings.

Keyboard: On, Off — Turns keyboard tracking for the oscillator on and off.

Sub Osc 1: 1...127 — Sub-oscillator 1 generates a square wave pitched one octave below oscillator 1. This parameter controls the level.

Sub Osc 2: 1...127 — Sub-oscillator 2 generates a square wave pitched two octaves below oscillator 2. This parameter controls the level.

Miscellaneous Oscillator Parameters

Sync 2-> 1: Off, On — Turns oscillator hard sync on. With sync on, whenever oscillator 2 resets, it will force oscillator 1 to reset for the classic hard sync sound.

Glide Mode: see table — Sets the way the oscillators respond to Glide settings.

Display	Glide mode
FixRate	The Glide rate is fixed. The time to transition from one note to another varies depending upon the interval between the notes.
FixRate A	The same, but Glide is only applied when played legato; that is, when a new note is hit while another note is still held.
FixTime	The Glide time is fixed. The time to transition from one note to another is the same, regardless of the interval.
FixTime A	The same, but Glide only is applied when played legato; that is, when a new note is hit while another note is still held.

Osc Slop: 0…5 — The amount of random oscillator frequency slop. The analog oscillators in Tetra are very accurate, and will not drift. This works great for

accurate sounds, and allows precise de-tuning. The Oscillator Slop parameter allows subtle amounts of frequency drift. For larger amounts, use a random LFO or white noise mod.

Pitch Wheel Range: 0…12 — Sets the bend range, in semitones, of the pitch wheel. The setting is the range in the positive or negative direction. For example, a setting of 7 lets you bend a note up or down by a fifth.

Mixer Parameters

Osc Mix: 0...127 — Enables the outputs of Oscillators 1 and 2 to be mixed in varying amounts. A setting of 0 is equivalent to 100% Oscillator 1 and 0% Oscillator 2. A setting of 127 is just the opposite. A setting of 64 is essentially a 50-50 mix of both oscillators.

Noise Level: 0…127 — Controls the volume of white noise mixed into the filter.

Feedback Parameters

Feedback Volume: 0...127 — This controls the amount of audio from the left channel of each voice fed back into that voice's mixer pre-filter. As the value increases, so does the effect of the feedback.

Feedback Gain: 0…127 — Feedback Gain boosts the level of the feedback signal and is interactive with and dependent upon Feedback Volume. If Feedback Volume is set to 0, then Feedback Gain has no effect. (There is no feedback signal to boost.) However, Feedback Gain combined with higher levels of Feedback Volume can result in effects ranging from pleasing distortion to squirrelly harmonic weirdness.

Low-pass Filter Parameters

Each of Tetra's voices utilizes a switchable, 2- or 4-pole analog low-pass filter coupled with a 4-stage (plus delay) ADSR envelope generator.

Frequency: 0…164 — Sets the base filter cutoff frequency over more than 13 octaves. This control steps in semitones.

Resonance: 0…127 — Sets the Resonance level of the filter. At high settings the filter will self-oscillate in 4-pole mode. If the filter does not oscillate, switch to 4-pole mode.

Keyboard Amount: 0…127 — Sets the amount of keyboard (MIDI note) to the filter cutoff. A setting of 64 will step the filter one semitone for each note, 32 would be half-semitones, and so on.

Audio Mod: 0...127 — Controls the amount of audio from Oscillator 1 used to modulate the filter cutoff frequency. For filter-only audio, set OSCILLATOR MIX to 127, OSCILLATOR 2 SHAPE to Off, and OSCILLATOR 1 SHAPE to the desired waveshape. This is useful for bell-like FM sounds. A wide range of sounds can also be made using AUDIO MOD with the oscillators routed normally through the filter.

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

Envelope Amount: -127…+127 — Sets the amount of filter envelope routed to the cutoff frequency. This can be positive or negative, allowing inverted envelope control of the filter.

Envelope Velocity: 0…127 — Amount of key velocity controlling the level of the filter envelope.

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

Attack: 0…127 — Sets the Attack time of the filter ADSR envelope generator.

Decay: 0…127 — Sets the Decay time.

Sustain: 0…127 — Sets the Sustain level.

Release: 0…127 — Sets the Release time.

VCA Parameters

VCA Level: 0…127 — Sets a base level for the VCA (Voltage Controlled Amplifier). This allows the VCA to be essentially bypassed, which is necessary for Programs that drone.

> **Note:** If VCA LEVEL is on full, Envelope Amount has no effect. You normally want VCA LEVEL set to zero. For droning sounds you will probably turn the VCA Level up.

Env Amount: 0…127 — Sets the amount of VCA envelope to the VCA level.

Env Velocity: 0…127 — Sets the amount of keyboard velocity controlling the level of the VCA envelope.

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

Attack: 0…127 — Sets the Attack time of the VCA ADSR envelope generator.

Decay: 0…127 — Sets the Decay time.

Sustain: 0…127 — Sets the Sustain level.

Release: 0…127 — Sets the Release time.

Pan Spread: 0…127 — There is a pan circuit after the VCA that pans the audio in the stereo field individually per voice. With a Pan Spread of 0, all four voices are panned dead center. As you turn up Pan Spread, each voice is gradually moved away from the center by different amounts. Every other voice goes in a different direction, left or right. This provides a wide stereo field as the voices play.

> **Note:** Any modulation to pan will individually move each voice from its static position as set by Pan Spread.

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

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

LFO Parameters

Tetra has four Low Frequency Oscillators (LFOs). The same parameters are available for each.

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

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

Above 150, the sync speeds are as follows:

Display	Timing Sync
32 Steps	Sequence speed divided by 32; i.e. one LFO cycle takes 32 steps
16 Steps	Sequence speed divided by 16
8 Steps	Sequence speed divided by 8
6 Steps	Sequence speed divided by 6
4 Steps	Sequence speed divided by 4

Display	Timing Sync
3 Steps	Sequence speed divided by 3
2 Steps	Sequence speed divided by 2
1.5 Step	Sequence speed divided by 1.5
1 Step	One cycle per step
2/3 Step	Two cycles every three steps
1/2 Step	Two cycles per step
1/3 Step	Three cycles per step
1/4 Step	Four cycles per step
1/6 Step	Six cycles per step
1/8 Step	Eight cycles per step
1/16Step	Sixteen cycles per step

Shape: see table — Selects the LFO waveshape:

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

Amount: 0…100 — Sets the amount of LFO routed to the destination.

Key Sync: Off, On — When on, the LFO is re-started each time a new note is played. Key Sync is set independently on each LFO.

Destination — See *Modulation Destinations* on page 39 for a list of possible destinations.

Envelope 3 Parameters

Envelope 3 is an auxiliary envelope for modulating various destinations. It can even be used as a sort of LFO using the Repeat parameter, which is unique to Envelope 3.

Destination — Sets the Envelope 3 destination. See *Modulation Destinations* on page 39 for a list of possible destinations.

Amount: -127…+127 — Sets the amount of Envelope 3.

Env Velocity: 0…127 — Sets the amount of key velocity controlling the level of envelope 3.

Env Delay: 0…127 — Sets a delay between the time Envelope 3 is triggered and when the Attack portion actually begins.

Env Attack: 0…127 — Sets the Attack time of Envelope 3.

Env Decay: 0…127 — Sets the Decay time.

Env Sustain: 0…127 — Sets the Sustain level.

Env Release: 0…127 — Sets the Release time.

Repeat: Off, On — When on, causes the delay, attack, decay, and sustain portions of Envelope 3 to loop for as long as the envelope is gated on.

Modulation Parameters

The Modulation Parameters let you configure the modulation routing and amount for Tetra's four general-purpose modulation slots as well as for MIDI controllers (Mod Wheel, Key Pressure, Breath Control, Velocity, and Foot Controller).

Since each Tetra mod source has a single destination, the four general purpose Mods provide a way to send a mod source (such as a sequence or LFO) to additional destinations, with a different amount. There are also additional mod sources available here, such as Noise, allowing a wide variety of possibilities.

To configure a general-purpose modulation slot, select the appropriate modulator (Mod 1, Mod 2, Mod 3, or Mod 4), and use the Source, Destination, and Amount parameters to route the modulation as desired.

To configure modulation for a standard MIDI controller, select the desired controller and amount, and then set the destination.

Source — Selects a modulation source. See *Modulation Sources* on page 43 for possible sources.

Amount: -127…+127 — Sets the amount of modulation.

Destination — Selects a modulation destination. See *Modulation Destinations* on page 39 for a list of possible destinations.

Mod Wheel Amount: -127…+127 — Sets the maximum amount of modulation that can be applied from MIDI Continuous Controller 1 (mod wheel).

Mod Wheel Destination — Selects the destination to which the mod wheel is routed. See *Modulation Destinations* on page 39 for a list of possible destinations.

Press Amount: -127…+127 **—** Sets the maximum amount of modulation that can be applied from MIDI Channel Pressure (aftertouch).

Press Destination — Selects the destination to which the Channel Pressure is routed. See *Modulation Destinations* on page 39 for a list of possible destinations.

Breath Amount: -127…+127 **—** Sets the maximum amount of modulation that can be applied from MIDI Continuous Controller 2 (breath controller).

Breath Destination — Selects the destination to which the breath control is routed. See *Modulation Destinations* on page 39 for a list of possible destinations.

Veloc Amount: -127…+127 **—** Sets the maximum amount of modulation that can be applied from MIDI note-on velocity.

Veloc Destination — Selects the destination to which the note-on velocity is routed. See *Modulation Destinations* on page 41 for a list of possible destinations.

Foot Amount: -127…+127 **—** Sets the maximum amount of modulation that can be applied from MIDI Continuous Controller 4 (foot controller).

Foot Destination — Selects the destination to which the foot control is routed. See *Modulation Destinations* on page 41 for a list of possible destinations.

Unison Parameters

Unison Mode: see table — Sets how voices are allocated and tuned when unison is on.

Display	Key mode
1 Voice	Classic, two oscillator, monophonic mode
All Voices	All available voices stacked in unison
AllDetune1–3	All available voices stacked in unison with increasing levels of detuning among the voices

Unison Assign: see table — Determines how Tetra responds to keyed notes when unison is on.

Display	Key mode
Low Note	Low note priority
LowRetrig	Low note priority, re-trigger envelopes
HighNote	High note priority
HighRetrg	High note priority, re-trigger envelopes
LastNote	Last note hit priority
LastRetrg	Last note hit priority, re-trigger envelopes

Unison: On, Off — Turns unison on or off. When unison is on, Tetra behaves like a monophonic synth.

Push It Switch Parameters

These parameters determine the behavior of the PUSH IT switch, Tetra's manual trigger.

Note: C0…C10 — Sets the note that plays when PUSH IT is pressed.

Velocity: 0…127 — Sets the MIDI note-on velocity.

Mode: Normal, Toggle — When set to Normal, PUSH IT responds like a key: press it and a note plays, release it and the note ends. But when set to Toggle, PUSH IT turns the note on with one press and off with a second press. This is handy for making a note drone or for latching a gated sequence on.

Keyboard Mode Parameters

The keyboard mode parameters determine how programs are mapped to a MIDI keyboard or other MIDI controller and provide compatibility with the Prophet '08's keyboard modes.

> **Note:** These parameters only appear in Program Mode, not Combo Mode, and only for layer A.

Split Point: C0…C10 — When in Split mode, sets the key at which the split occurs. Layer A (voices 1 and 2) is mapped below the split point. Layer B (voices 3 and 4) is mapped to the chosen split point and above.

Key Mode: Normal, Stack, Split — Determines how the layers respond to MIDI note data in Program Mode. For Normal, layer A plays for the entire key range. Press EDIT B/COMBO to switch to layer B.

For Stack, both layers respond to MIDI notes for the entire key range, enabling two patches to be played simultaneously with a single key stroke. Voices 1 and 2 are assigned to layer A, 3 and 4 are assigned to layer B.

Split assigns layer A from the lowest note to below the split point (see previous parameter) and layer B from the split point to the highest note.

> **Note:** In Combo Mode and Multi Mode, layer B is ignored.

Clock Parameters

The sequencer and arpeggiator share the BPM and CLOCK DIVIDE settings.

BPM: 30…250 — Sets the programmed tempo for the sequencer in BPM (beats per minute).

Clock Divide: see table — Sets the note value for each sequence step relative to the BPM.

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

Arpeggiator Parameters

Tetra's arpeggiator has four different operating modes and can be synced to a MIDI clock source.

> **Note:** If the arpeggiator does not seem to be working, check the GLOBAL parameters to make sure Clock is set to Internal. If Clock is set to use an external clock source, Tetra must be receiving MIDI clock messages in order for the arpeggiator to run.

The tempo and note value are determined by the Clock Parameters.

Mode: see table — Sets the order in which the arpeggiator plays notes.

Mode	Behavior
Up	Plays from lowest to highest note.
Down	Plays from highest to lowest note.
Up Down	Plays from lowest to highest and back to lowest.
Assign	Plays notes in the order keys were pressed.
Random	Randomly plays notes.
2oct Up	Plays keyed notes and the same notes one octave higher, from lowest to highest.
2oct Down	Plays keyed notes and the same notes one octave higher, from highest to lowest.
2oct UpDown	Plays keyed notes and the same notes one octave higher, from lowest to highest and back to lowest.
2oct Assign	Plays a keyed note, then the same note one octave higher, in the order keys were pressed.
2oct Random	Randomly plays keyed notes and the same notes one octave higher.
3oct Up	Plays keyed notes and the same notes one and two octaves higher, from lowest to highest.
3oct Down	Plays keyed notes and the same notes one and two octaves higher, from highest to lowest.
3oct UpDown	Plays keyed notes and the same notes one and two octaves higher, from lowest to highest and back to lowest.
3oct Assign	Plays a keyed note, then the same note one and two octaves higher, in the order keys were pressed.
3oct Random	Randomly plays keyed notes and the same notes one and two octaves higher.

On/Off: Off, On — Turns the arpeggiator on and off. Turning it on will turn off the Sequencer if it is on.

Sequencer Parameters

Seq Trigger: see table — Sets the triggering mode for the Sequencer.

Display	Trigger mode
Normal	Sequence plays from the first step when a key is held, and resets to step 1 each time a new note is played. Each sequence step retriggers the envelopes.
No Reset	The same, but does not reset to step 1 on every note.
No Gate	The keyboard triggers the envelopes; the sequence steps do not.
NoGateNR	Same, but does not reset with subsequent notes.

Display	Trigger mode
Key Step	Striking a key advances the sequencer one step.

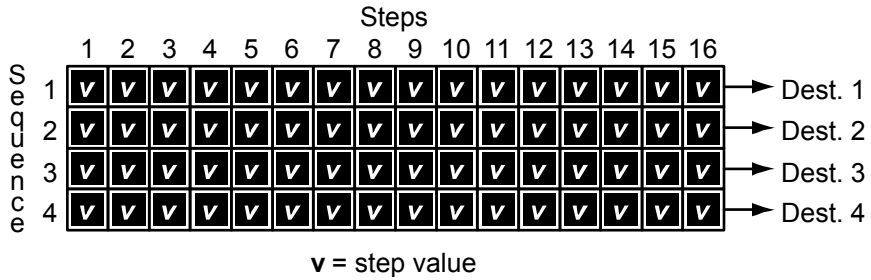
On/Off: Off, On — Turns the sequencer on and off.

Seq 1, 2, 3, or 4 Destinations — Sets the destination for each of the four sequence tracks. For a complete list, see *Modulation Destinations* on page 41.

Seq 1, 2, 3, or 4 Steps: C0…D5+ or 0…125, Reset, Rest — Sets each step value for each of the four sequence tracks. The values are displayed as both relative note values and as simple numerical values. Note values are displayed in quarter tones with a plus sign (+) indicating that the pitch is a quarter tone higher than the displayed note number. The two highest values are Reset and Rest. Reset causes the sequence to reset to the first step, enabling sequences of fewer than 16 steps or even sequences in which the tracks are different lengths. Rest inserts a rest on the selected step.

About the Sequencer

For many musicians, the term sequencer has become synonymous with MIDI sequencer; that is, a computer-based application or dedicated hardware device for recording and playing back notes and performance gestures via MIDI. But sequencers were around long before MIDI. Tetra's sequencer is much more like the original analog sequencers typically associated with modular synthesizer systems. The sequencer comprises four 16-step sequences that play in parallel. Each sequence can be routed to a chosen destination, and each step in a sequence can be set to a different value used to modulate that destination. Each of the four voices has its own sequencer.



Strictly speaking, Tetra's sequencer does not play notes, nor does it transmit MIDI data. If none of the sequence destinations are routed to oscillator frequency, the sequencer may not even affect the pitch. In Tetra terms, a sequence is just a series of events at timed intervals that changes the value of one of the synth's parameters in discrete steps. Because the four sequences play in parallel, up to four parameters can be affected by each step, one per sequence.

For the most part, the sequence destinations are the same as the modulation destinations, which is appropriate: a sequence is just another modulation source.

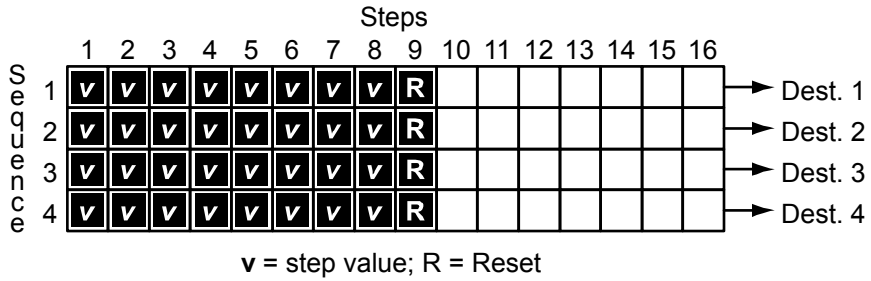
For each sequence step, the envelopes are gated on for half the step's duration. The duration varies according to the BPM and Clock Divide settings (or the MIDI clock, if synced to an external source). The envelope settings of the current program ultimately determine how long each step plays, though, and longer (more legato) or shorter (more staccato) effects can be achieved by editing the envelope rates.

Tetra's sequencer is a gated sequencer. That means it requires a note to be gated on—that is played from the PUSH IT button or via MIDI—in order for the sequencer to run. There is no dedicated start or play button and it does not respond to MIDI start/stop/continue messages, but it can still sync to an external clock. Simply turn on the sequencer and then play and hold a note to start. Or use the PUSH IT button's toggle feature to latch a note on with one push and release it with another; in this case, the PUSH IT button is essentially a Start/Stop control.

Reset and Rest

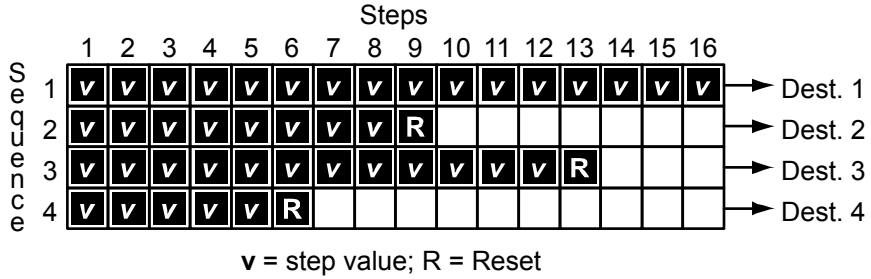
Sequences have a maximum of 16 steps, but they can have fewer—from 1 to 15—using Reset. (Sequences of 16 steps reset automatically.) Reset appears immediately after the highest value setting for a step. Setting a step to Reset causes the sequence to jump back to the first step and continue playing.

Reset is set separately for each of the four sequences, so it must be set at the same step in all four sequences to shorten all the sequences equally. The following illustration shows an example in which all the sequences are eight steps in length.

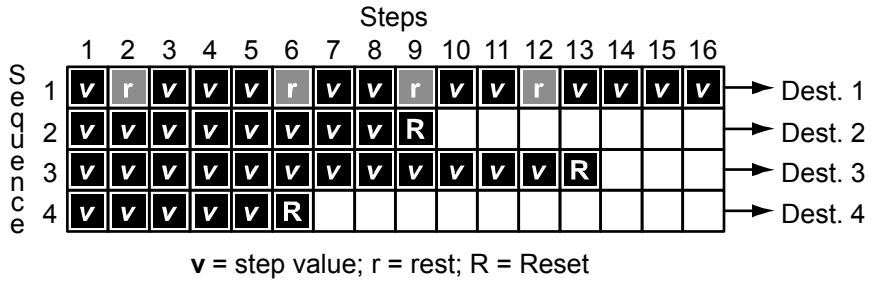


Tip: Using Reset while programming a sequence can be helpful. For example, when programming a specific melodic line, start by shortening the sequence to four or eight steps until those steps are set, and then gradually move the reset point to lengthen the loop until the desired number of steps is playing.

Sequences do not have to be the same length, however, which makes for some very interesting, less repetitive patterns, particularly when sequences are set to odd and even numbers of steps.



Sequence one has an additional value, Rest, that appears in the list after Reset. Rest prevents the envelopes from being gated by the corresponding step, so a rest in sequence one affects all four sequences. If the sequences are the same length, rests will occur in the same place in all four sequences as they loop. If the sequences are different lengths, the rests in sequence one apply to whatever the current step happens to be in sequences two through four, resulting in a more random-sounding pattern (which can be really cool). In the following example, sequence one is 16 steps long and rests occur at steps 2, 6, 9, and 12. However, sequence two is only eight steps long, so rests occur at steps 2 and 6 the first time it plays through and then at steps 1 and 4—corresponding to steps 9 and 12 in sequence one—the first time it repeats. As sequence two loops, the rests will continue in the same alternating pattern.



Programming the Sequencer

Programming the sequencer is easy, but there are a few things to consider before you start. Most importantly, what do you want the sequence to do and what modulation destinations will provide the results you're seeking? For example, is the sequencer going to control oscillator frequency? One sequence can control the frequency of both oscillators or one sequence can control oscillator 1 and another sequence can control oscillator 2 for harmonies or countermelodies. A typical application of the sequencer might have sequence one routed to the frequency of both oscillators, sequence two routed to filter cutoff, sequence

three routed to filter resonance, and sequence four routed to amplifier envelope amount for accents. Many of the factory programs have sequences programmed, so you can refer to those to see how certain effects are being achieved.

To program a sequence:

1. Set the Sequencer On/Off parameter to On.

2. Play a note to start the sequence playing.

   To avoid having to hold a key down, set the Push It Mode to Toggle. Then use PUSH IT to start and stop the sequencer. You may also want to change the Push It Note, the BPM, and the Clock Divide.

3. Choose a destination for the sequence.

4. Set the step values for the corresponding sequence to the desired values. To quickly edit a sequence, turn ASSIGN PARAMS on and use one of the ASSIGNABLE PARAMETERS knobs to choose the sequence step and the SELECT or increment (+)/decrement (-) buttons to change the value.

   As the sequence loops, you will hear your edits.

5. Follow the same basic steps to program the other sequences.

6. Don't forget to write your edits to memory! Sequences are saved with the related program. Just press WRITE and then the increment (+) button to save the program and sequences.

Slew

In modular analog synthesizers, *a lag processor* or *slew limiter* is used to create a time-varying change—a smooth transition—between successive, discrete control voltage levels. The rate of change is called the *slew rate* and one common application is to create a glide (aka *portamento*) effect between notes.

Among the possible destinations for Tetra sequences two and four is a sequence-only parameter called Slew. Slew behaves a little differently from the other modulation destinations, in that it is not really a destination at all; instead, it affects the sequence above it. That is, if Slew is the chosen destination for sequence two, it controls sequence one, and Slew in sequence four controls sequence three.

In Tetra's sequencer, Slew sets the slew rate between the previous step's value and the current step's value when the step is gated on. Confused yet? This should help: let's say sequence one is routed to oscillator frequency and sequence two to Slew. Increasing the Slew value for step four will cause the

oscillator frequency to glide from the step three value when step four is gated on. The higher the Slew value, the slower the slew rate. And the slew rate can be different for each step. But its not just for oscillator glide. Slew can be applied to any of the destinations. For example, sequence three could be routed to filter cutoff with Slew in sequence four used to create a less abrupt transition from one step to the next.

> **Note:** Depending upon the BPM and Clock Divide settings, the slew rate can actually exceed the time the envelopes are gated on, causing a step in the affected sequence to not reach its set value. For example, if Slew is applied to oscillator frequency, high Slew values may cause a step to sound flat or sharp. If that's not what you want, simply reduce the Slew value.

Syncing an LFO to the Sequencer

One very useful way to modulate a parameter in sync with a sequence is using an LFO with Clock Sync. A setting of 16 Steps for LFO Frequency with a triangle wave selected and routed to the filter will provide a clean filter sweep over a 16-step sequence, perfectly in sync! This is much easier (and smoother) than manually programming a sequence to sweep the filter.

Name Parameter

Edit Name — The lower LCD line displays the name of the Program with the active character blinking. When ASSIGN PARAMETERS is lit, the parameter control changes the position of the active character and SELECT and the increment (+) and decrement (-) buttons change the character.

Combos

A combo is a collection of four programs—one per voice—combined to make a sort of super program. How a combo responds to MIDI note data depends largely upon whether or not it is monophonic (that is, unison is on) or polyphonic. The typical uses for a combo are:

Stacked unison—All four voices play from a single key or the PUSH IT button with four different programs.

Multitimbral sequence playback—Four different programs and their sequences play back simultaneously from a single key or the PUSH IT button.

"Modular-style" polyphony—Four-voice polyphony with a different program per voice.

Tetra has 128 combos. To access them, press the mode button to light the COMBO LED. Change combos using SELECT or increment (+) and decrement (-). The bottom row of knobs (PITCH, CUTOFF, etc.) affects all the programs in the combo. Though this may not make sense in all cases, changing all four programs in a combo with a single control makes for some very interesting live editing possibilities.

Each of the Assignable Parameters knobs controls one parameter for the respective voice. That is, knob 1 controls a parameter for voice 1, knob 2 for voice 2, and so on.

Creating a Combo

It probably goes without saying, but it is generally quicker and easier to create combos using the editor. It can be done without the editor, though.

To create a combo from scratch, press EDIT B/COMBO while in Combo Mode. The display looks something like this:

The top line shows the program and the voice to which it is assigned, and the bottom line shows the program name. Use SELECT or the increment or decrement buttons to choose another program. Programs can be selected from other combos or from the regular program banks. For example, choosing Combo 55 Prt2 loads the program from voice 2 of combo 55 into the current combo location. To access the regular program banks, hold the increment button briefly until the next bank is displayed. Then the display will look something like the following:

The top row shows the current combo, the program, the bank, and the voice being edited. The bottom row shows the program name.

> **Note:** Though the other combos and program banks can be used as a starting point for building new combos, the actual programs used are copies, so any edits made in Combo Mode do not affect the source programs. The converse is also true. Say a combo is created using the program "Arid" and then Arid is subsequently edited in Program Mode. Those changes will not be propagated to the combo. (The edited program can be reassigned to the combo, though.) In other words, Combos contain all parameters for all four voices when saved, and do not rely on referencing or mapping other programs, making organization and maintenance much easier.

Use the PUSH IT button or a MIDI controller to audition any changes made to voice 1.

The ASSIGNABLE PARAMETERS are initially the same as for the chosen program, but can be reassigned, if desired, without affecting the assignments in the original program. Simply press ASSIGN PARAMS and choose the desired parameters as in Program Mode.

> **Note:** A few parameters do not appear in Combo Mode, or appear only on certain voices. In addition to the exceptions noted below, Unison Mode, Split Point, and Key Mode never appear in Combo Mode.

When satisfied with the selections/edits, press EDIT B/COMBO again to move on to voice 2. When assignments have been made for all four voices, press EDIT B/COMBO to exit and play the combo.

To set the relative voice volumes in a combo, press EDIT B/COMBO to enter single voice edit mode. The VOLUME knob can then be used to set the Voice Volume parameter for voice 1. Press EDIT B/COMBO again to move on to voice 2, and so on.

The combo's name is set using the Edit Name parameter for voice 1 (ASSIGNABLE PARAMETER 1) *only* when EDIT B/COMBO is turned off. And, of course, don't forget to save changes using WRITE. The combo can be saved to the current, or another, memory location. After pressing WRITE, use SELECT to choose the target combo number.

There are other parameters that affect how combos play back. If Unison is set to Off for voice 1 (the Unison on/off parameter *only* appears under voice 1, not

voices 2 through 4), the combo will play back polyphonically. If the PUSH IT button is to be used to latch notes on, Push It Mode must be set to Toggle in each of the voices. To start playback of four sequences simultaneously from the PUSH IT button, set Unison to On in voice 1, set the Push It Mode to Toggle for all four voices, and make sure Sequencer is set to On for all four voices. If the Audio Out parameter in the Global menu is set to Quad, each of the voices in a combo can be processed separately.

The editor has the ability to copy any combo voice or any program layer (A or B) to any other combo voice or program layer. This provides a very fast way to build up combos. For example, say you like the kick drum on voice 1 of a factory combo. You can copy it and paste it to any voice on a new combo. Then, you could find a snare from a different combo, and copy it into a different voice on your new combo. Do the same for the remaining voices and you have a new customized combo that you can then further edit to your liking.

Combos and Multi Mode

Combos can also be used to "cue up" programs used in Multi Mode. When Multi Mode is used with an external sequencer, the sequencer typically determines which programs will play by sending MIDI program change messages on the relevant tracks and MIDI channels. As an alternative, a combination of Combo Mode and Multi Mode can be used to recall four programs—one per voice—and have each voice respond to a different MIDI channel. For more information about Multi Mode, see *Global Parameters* on page 13.

Using Poly Chain

Poly Chain enables multiple Tetras to be chained together for increased polyphony, up to 16 voices. MIDI note data from a keyboard, sequencer, or other controller is intelligently processed so that, when one synth's maximum polyphony is reached, additional notes are passed through the Poly Chain Out jack and routed to another synth. All that is required is a single MIDI cable for each of the chained synths and a mixer for combining the audio outputs. Tetra can also be poly chained with a Mopho or Prophet '08.

The same programs should be loaded into all the chained synths. The easiest way to do that is to use the Dump command in the Global menu to dump the programs via MIDI from one synth to the other(s).

> **Note:** Tetra's program banks 1 and 2 come pre-loaded with the Prophet '08 factory programs.

On the master instrument—the first Tetra in the chain—set Poly Chain to the number of additional voices that will be chained: Out 1 (for poly chaining a Mopho), Out 4, Out 8, or Out 12. To chain three Tetras, set Poly Chain on the intermediate instrument to InOut4. For four Tetras, set the second instrument in the chain to InOut8 and the third to InOut4. Regardless of how many are chained together, the last Tetra is always set to In End. You can also use one or two Tetras to expand the polyphony of a Prophet '08. See the illustration at the end of this section for more information.

You can now virtually ignore the slave unit or units, since the controls on the master will control all units as if they were a single synth. This includes saving a program; if you save an edited program on the master, it will also save the program on the slave(s).

> **Note**: If syncing to an external MIDI clock, set MIDI Clock (Global menu) on the master and any intermediate units to MIDI In/Out. Set the last instrument in the chain to MIDI In.

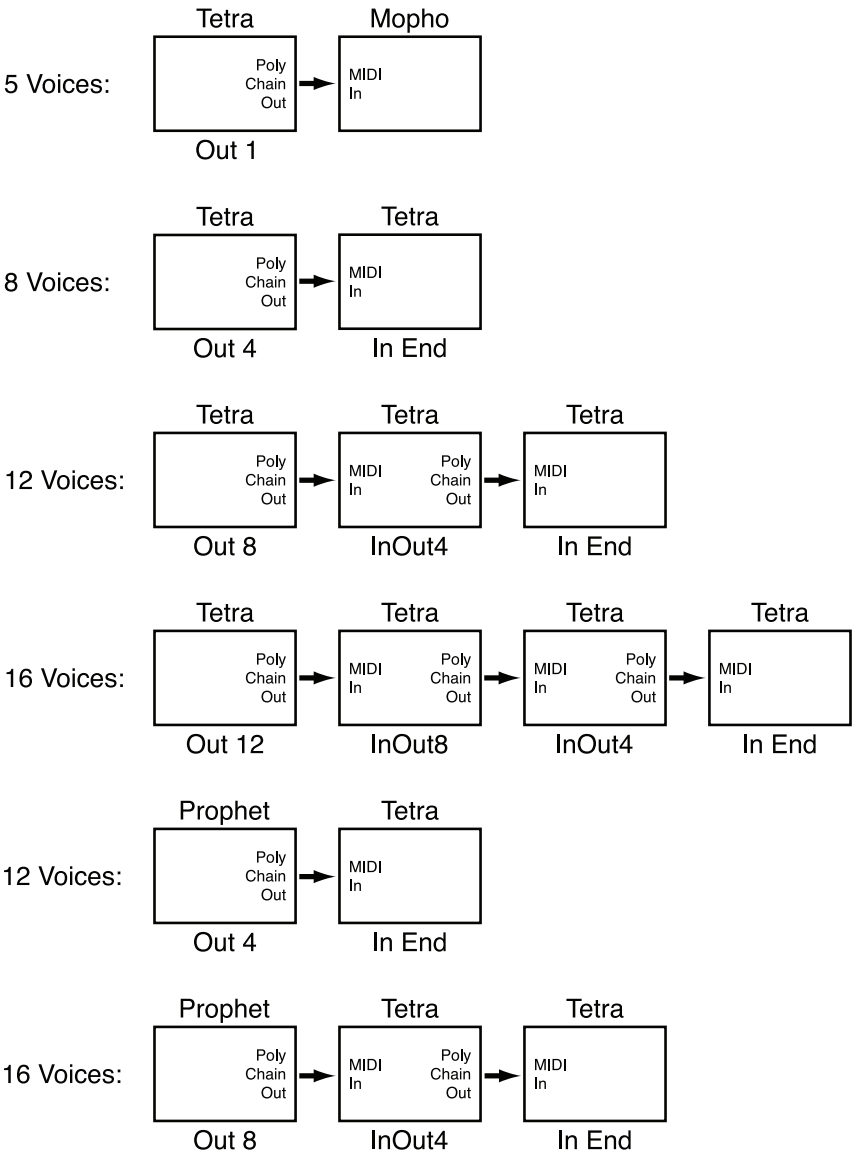
When Poly Chain is set to Off, the Poly Chain MIDI out jack simply duplicates the MIDI out jack.

A Note About Poly Chain and the Mopho Desktop

Unlike Tetra and the Prophet '08, Mopho does not have layered programs. It is only one voice and so can not do stacked or split programs. Because of that, when slaving a Mopho to a Tetra for poly chaining (for 5 voices total), only Tetra's four voices will play when a stacked or split program is selected. In other words, the Mopho voice will only play in normal keyboard mode.

Also, Mopho's INPUT GAIN (similar to Tetra's FEEDBACK GAIN) is not programmable, so it may take some tweaking to get feedback to sound the same on Mopho and Tetra, even if the same programs are loaded in both. Programs that don't use feedback should sound the same.

Various Poly Chain Configurations Using Tetra, Mopho, and the Prophet '08*



*If Out 4 and Out 8 do not appear as poly chain options on the Prophet, contact support@davesmithinstruments.com for information about updating the OS.

Using USB

Tetra'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. Tetra 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.

Tetra transmits and receives MIDI data via USB, but does not transmit audio.

> **Note:** MIDI In and USB should not be used at the same time, as overlapping messages from different sources may cause Tetra to respond unpredictably. MIDI Out and USB can be used at the same time and transmit the same data. Poly Chain Out is an independent MIDI bus and can be used regardless of the "normal" MIDI connection.

USB Notes

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

Under Windows XP, the first time Tetra is connected via USB, the "Found new hardware" alert appears and Tetra is automatically installed—somewhat misleadingly—as "USB Audio Device." If there is already another Class Compliant USB device installed, Tetra will show up as "USB Audio Device(2)" (or 3 or 4 or...).

To determine which USB Audio Device is Tetra:

1. Open the System Control Panel
2. Click the Hardware tab.
3. Click Device Manager.
4. Expand "Sound, video, and game controllers."
5. Right-click any "USB Audio Device" and choose Properties from the pop-up menu.

The General tab of the USB Audio Device Properties window displays the Device Type, Manufacturer, and Location. For Tetra, the Location should read "Location *n* (DSI Tetra)."

Windows Vista essentially behaves the same as XP, but the device name is DSI Tetra rather than USB Audio Device.

In Windows, if you unplug the USB cable and plug it back in while a program has the Tetra port open, you may have to resync. That usually means going to the USB Audio Device (or DSI Tetra) Properties, as in the procedure above, and clicking OK. If Tetra is no longer listed in the Device Manager under “Sound, video, and game controllers,” power Tetra down and back up again while it is connected via USB. It should be detected on power up.

Modulation Destinations

Display	Destination
Off	No destination selected
Osc 1 Freq	Oscillator 1 Frequency
Osc 2 Freq	Oscillator 2 Frequency
OscAllFreq	Oscillator 1 and 2 Frequency
Osc Mix	Oscillator Mix
NoiseLevel	Noise Level
Osc1 PulsW	Oscillator 1 Pulse Width
Osc2 PulsW	Oscillator 2 Pulse Width
Osc All PW	All Oscillators Pulse Width
Low Pass	Lowpass Filter Frequency
Resonance	Resonance
Audio Mod	Audio Mod Amount
VCA Level	VCA Amount
Output Pan	Stereo Pan Position
LFO 1 Freq	LFO 1 Frequency
LFO 2 Freq	LFO 2 Frequency
LFO 3 Freq	LFO 3 Frequency
LFO 4 Freq	LFO 4 Frequency
LFOAllFreq	All LFO Frequencies
LFO 1 Amt	LFO 1 Amount
LFO 2 Amt	LFO 2 Amount
LFO 3 Amt	LFO 3 Amount
LFO 4 Amt	LFO 4 Amount
LFOAll Amt	All LFO Amounts
Env 1 Amt	Envelope 1 Amount (Level)
Env 2 Amt	Envelope 2 Amount (Level)
Env 3 Amt	Envelope 3 Amount (Level)
EnvAll Amt	All Envelope Amounts (Levels)
Env1Attack	Envelope 1 Attack Rate
Env2Attack	Envelope 2 Attack Rate
Env3Attack	Envelope 3 Attack Rate
EnvAll Att	All Envelope Attack Rates
Env1 Decay	Envelope 1 Decay Rate
Env2 Decay	Envelope 2 Decay Rate
Env3 Decay	Envelope 3 Decay Rate
EnvAll Dec	All Envelope Decay Rates
Env1Releas	Envelope 1 Release Rate
Env2Releas	Envelope 2 Release Rate

Env3Releas	Envelope 3 Release Rate
EnvAll Rel	All Envelope Release Rates
Mod 1 Amt	Modulator 1 Amount
Mod 2 Amt	Modulator 2 Amount
Mod 3 Amt	Modulator 3 Amount
Mod 4 Amt	Modulator 4 Amount
Fback Vol	Feedback Volume
Sub Osc 1	Sub Oscillator 1 Level
Sub Osc 2	Sub Oscillator 2 Level
Fback Gain	Feedback Gain
Seq1 Slew	Sequencer 1 Slew Rate (Seq 2 Dest only)
Seq2 Slew	Sequencer 2 Slew Rate (Seq 4 Dest only)

Modulation Sources

Display	Source
Off	No source selected
Sequence1	Sequence 1
Sequence2	Sequence 2
Sequence3	Sequence 3
Sequence4	Sequence 4
LFO 1	LFO 1
LFO 2	LFO 2
LFO 3	LFO 3
LFO 4	LFO 4
Filt Env1	Filter Envelope
VCA Env 2	Amp (VCA) Envelope
Envelope3	Envelope 3
PitchBend	Pitch Bend
Mod Wheel	Mod Wheel
Pressure	Pressure (Aftertouch)
MidBreath	MIDI — Breath Controller
Midi Foot	MIDI — Foot Controller
Midi Exp	MIDI — Expression
Velocity	Keyboard Note Velocity
KeyNumber	Keyboard Note Number
Noise	Noise

Parameter List

Osc 1 Frequency
Osc 1 Fine Freq
Oscillator 1 Shape
Oscillator 1 Glide
Osc 1 Key Track
Sub Osc 1 Level
Osc 2 Frequency
Osc 2 Fine Freq
Oscillator 2 Shape
Oscillator 2 Glide
Osc 2 Key Track
Sub Osc 2 Level
Osc Hard Sync
Glide Mode
Oscillator Slop
Pitch Wheel Range
Oscillator Mix
Noise Level
Feedback Volume
Feedback Gain
Filter Cutoff Freq
Filter Resonance
Filter Keyboard Amt
Filter Audio Mod
Filter Config/Mode
Filter Env Amount
Filter Env Velocity
Filter Env Delay
Filter Env Attack
Filter Env Decay
Filter Env Sustain
Filter Env Release
VCA Level
VCA Env Amount
VCA Env Velocity
VCA Env Delay
VCA Env Attack
VCA Env Decay
VCA Env Sustain
VCA Env Release
Pan Spread
Program Volume
LFO 1 Frequency
LFO 1 Shape
LFO 1 Amount
LFO 1 Destination
LFO 1 Key Sync
LFO 2 Frequency
LFO 2 Shape
LFO 2 Amount
LFO 2 Destination
LFO 2 Key Sync
LFO 3 Frequency
LFO 3 Shape
LFO 3 Amount
LFO 3 Destination
LFO 3 Key Sync
LFO 4 Frequency
LFO 4 Shape
LFO 4 Amount
LFO 4 Destination
LFO 4 Key Sync
Env 3 Destination
Envelope 3 Amount
Envelope 3 Velocity
Envelope 3 Delay
Envelope 3 Attack
Envelope 3 Decay
Envelope 3 Sustain
Envelope 3 Release
Envelope 3 Repeat
Mod 1 Source
Mod 1 Amount
Mod 1 Destination
Mod 2 Source
Mod 2 Amount
Mod 2 Destination
Mod 3 Source
Mod 3 Amount
Mod 3 Destination
Mod 4 Source
Mod 4 Amount
Mod 4 Destination
Mod Wheel Amount
Mod Wheel Dest
Pressure Amount
Pressure Destination
Breath Amount
Breath Destination
Velocity Amount
Velocity Destination
Foot Control Amt
Foot Control Dest
Unison Mode*
Unison Assign
Unison On/Off**
Push It Note
Push It Velocity
Push It Mode
Split Point†
Key Mode†
Clock BPM
Clock Divide
Arpeggiator Mode
Arpeggiator On/Off
Sequence Trigger
Sequencer On/Off
Seq 1 Destination
Seq 2 Destination
Seq 3 Destination
Seq 4 Destination
Seq 1 Steps 1 - 16
Seq 2 Steps 1 - 16
Seq 3 Steps 1 - 16
Seq 4 Steps 1 - 16
Edit Name

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* Program Mode only; not in Combo Mode
** In Combo Mode, voice 1 only
† Program Mode, layer A only

Support

Troubleshooting

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

The sequencer has stopped running.
Make sure Clock in the Global menu is set to Internal.

Some of the programs sound different.
Check the Mod Wheel position. The Mod Wheel can do a lot more than just add vibrato. Also, some of the programs use the sequencer to shape the sound so make sure Clock in the Global menu is set to Internal.

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 Tetra. Or use MIDI, which is opto-isolated.

Tetra 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 Tetra'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 Tetra is being overrun with duplicate messages.

An oscillator or the filter sounds strange or out of tune.
Hold down ASSIGN PARAMS and press the mode switch to run the calibration routine.

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

Still experiencing a problem with Tetra? Reset the Global parameters (in the Global menu).

Contacting Technical Support

If you are still having a problem with Tetra, contact Technical Support at support@davesmithinstruments.com. Please include your Tetra's serial number, the version of the operating systems (Main and Voice displayed on startup), and the purchase date.

> **Note:** If you have not already reset the Global parameters and run the calibration routine (see *Troubleshooting* above), you should do it before

contacting Technical Support. It's probably the first thing they'll ask you to do.

Warranty Repair

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

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

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

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

MIDI Implementation

Tetra receives MIDI data according to the mode controls under GLOBAL. In addition, there is interaction between some of the program parameters that determine the overall response of Tetra to MIDI data. Note that the following applies to using both the MIDI jacks and USB.

Following are the Global parameters that affect response to MIDI:

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

Clock: see table — Selects the MIDI clock status as follows:

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

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

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

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

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

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" table following
1100 nnnn	0ppppppp		Program change, 0-127 for Programs 1-128 within current Bank
1101 nnnn	0vvvvvvv		Channel Pressure
1110 nnnn	0vvvvvvv	0vvvvvvv	Pitch Bend LS Byte then MS Byte

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

Received Controller Messages

Status	Second	Third	Description
1011 nnnn	1	0vvvvvvv	Mod Wheel — directly assignable controller
1011 nnnn	2	0vvvvvvv	Breath Controller — directly assignable controller
1011 nnnn	4	0vvvvvvv	Foot Controller — directly assignable controller
1011 nnnn	7	0vvvvvvv	Volume — Combined with Master Volume and Voice Volume
1011 nnnn	74	0vvvvvvv	Brightness — Added to low-pass filter cutoff frequency
1011 nnnn	11	0vvvvvvv	Expression Controller — directly assignable controller
1011 nnnn	32	0vvvvvvv	Bank Select — 0 -3 select banks 1 – 4; others ignored
1011 nnnn	64	0vvvvvvv	Damper pedal — holds envelopes in Sustain if 0100 0000 or higher
1011 nnnn	123	0vvvvvvv	All Notes Off — clear all MIDI notes
1011 nnnn	121	0vvvvvvv	Reset All Controllers — clears all MIDI controllers to 0, MIDI volume to maximum

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

Transmitted Channel Messages

Status	Second	Third	Description
1100 nnnn	0ppppppp		Program change, 0 — 127 for Programs 1 — 128 within current Bank

Transmitted Controller Messages

Status	Second	Third	Description
1011 nnnn	0000 0111	0vvvvvvv	Volume knob
1011 nnnn	0010 0000	0vvvvvvv	Bank Select — 0 to 2

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

Additional Continuous Controllers (CCs) Transmitted/Received

The following table details how CCs are mapped onto Tetra's controls. They are transmitted when MIDI Parameter Send is set to CC in Global, and recognized when received when MIDI Parameter Receive is set to either CC or All in Global.

Parameter	CC
OSC 1 FREQ	20
OSC 1 FREQ FINE	21
OSC 1 SHAPE	22
GLIDE 1	23
OSC 2 FREQ	24
OSC 2 FREQ FINE	25
OSC 2 SHAPE	26
GLIDE 2	27
OSC MIX	28
NOISE LEVEL	29
SUB OSC 1 LEVEL	30
SUB OSC 2 LEVEL	31
FEEDBACK VOLUME	52
FEEDBACK GAIN	53
FILTER FREQ	102
RESONANCE	103
FIL KEY AMT	104
FIL AUDIO MOD	105
FILTER ENV AMT	106
FIL ENV VEL AMT	107
FIL DEL	108
FIL ATT	109
FIL DEC	110
FIL SUS	111
FIL REL	112
VCA LEVEL	113
OUTPUT PAN	114
VCA ENV AMOUNT	115
AMP ENV VEL AMT	116
VCA DEL	117
VCA ATT	118
VCA DEC	119
VCA SUS	75
VCA REL	76
ENV3 DEST	85
ENV3 AMT	86
ENV 3 VEL AMT	87
ENV 3 DELAY	88
ENV3 ATT	89
ENV3 DEC	90
ENV3 SUS	77
ENV3 REL	78
TEMPO	14
TIME SIG	15

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 either NRPN or All 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 following table shows the Global data sent and received on global parameter dumps, and the corresponding NRPN numbers.

NRPN	Range	Description
384	0 - 24	Master Transpose: 0= -12 semitones (1 octave), 12=0 (no transpose), and 24= +12 semitones.
385	0 - 100	Master Fine Tune: 0 = -50 cents, 50 = 0 (centered), 100 = + 50 cents
386	0 - 16	MIDI Channel: if = 0, data received on all MIDI channels. Otherwise = channel number 1 - 16.
387	0 - 7	Poly Chain* 0 Off 1 Out 1 2 Out 4 3 Out 8 4 Out 12 5 In End 6 InOut4 7 InOut8
388	0 - 4	MIDI Clock Source* 0 Use Internal clock, don't send MIDI clock 1 Voice 1 is the master clock in Combo mode 2 Use Internal clock, send MIDI clock 3 Use MIDI clock In 4 Use MIDI clock In, and retransmit MIDI clock out
389	0 - 1	Local Control* Off/On
390	0 - 2	Parameter Send*: 0 NRPN 1 CC 2 Off

391	0 - 3	Parameter Receive†: 0 All 1 NRPN only 2 CC only 3 Off
394	0 - 1	MIDI Controller Send/Receive Off/On
395	0 - 1	MIDI Sysex Send/Receive Off/On
400	0 - 3	Audio Out: 0 Stereo 1 Mono 2 Quad 3 Q LR34
403	0 - 13	Balance Tweak*: 0 = -7, 7 = 0, and 13 = 7
404	0 - 2	Pot Mode: Relative, Passthru, Jump
406	0 - 1	MIDI Out Select*: 0 MIDI Out 1 MIDI Thru
407	0 - 1	Multi Mode Off/On
411	0 - 1	Select layer A (0) or B (1)
412	0 - 1	Select Program mode (0) or Combo mode (1)
413	0 - 4	Select voice 0 All voices 1 Voice 1 2 Voice 2 3 Voice 3 4 Voice 4

*Received, but not sent.

†Sent, but ignored when received.

Program Parameter Data

The following table lists Tetra's voice parameters. The parameter number in the program and edit buffer dumps are different than the NRPN numbers as seen; this was to maintain NRPN compatibility with the Prophet '08 as much as possible.

Parm	A	B	Range	Description
0	0	200	0 – 120	Oscillator 1 Frequency, 0 – 120 in semitones (10 octave range)
1	1	201	0 – 100	Oscillator 1 Fine Tune; 0 = -50 cents, 50 = 0 (centered), 100 = + 50 cents
2	2	202	0-103	Oscillator 1 Shape 0 Oscillator Off 1 Sawtooth 2 Triangle 3 Sawtooth/triangle mix 4 – 103 Pulse Wave, Pulse width 0 – 99
3	3	203	0 - 127	Oscillator 1 Glide

4	4	204	0 - 1	Oscillator 1 Keyboard Off/On
6	5	205	0 – 120	Oscillator 2 Frequency, 0 – 120 in semitones (10 octave range)
7	6	206	0 – 100	Oscillator 2 Fine Tune; 0 = -50 cents, 50 = 0 (centered), 100 = + 50 cents
8	7	207	0-103	Oscillator 2 Shape 0 Oscillator Off 1 Sawtooth 2 Triangle 3 Sawtooth/triangle mix 4 – 103 Pulse Wave, Pulse width 0 – 99
9	8	208	0 - 127	Oscillator 2 Glide
10	9	209	0 - 1	Oscillator 2 Keyboard Off/On
12	10	210	0 - 1	Sync off/on
13	11	211	0 - 3	Glide Mode: 0 fixed rate 1 fixed rate auto 2 fixed time 3 fixed time auto
14	12	212	0 - 5	Oscillator Slop
16	13	213	0 - 127	Oscillator 1 - 2 Mix
17	14	214	0 - 127	Noise Level
20	15	215	0 - 164	Filter Frequency, steps in semitones
21	16	216	0 - 127	Resonance
22	17	217	0 - 127	Filter Keyboard Amount
23	18	218	0 - 127	Filter Audio Modulation
24	19	219	0 - 1	Filter Poles 0: 2-pole; 1: 4-pole
25	20	220	0 - 254	Filter Envelope Amount; -127 to +127
26	21	221	0 - 127	Filter Envelope Velocity Amount
27	22	222	0 - 127	Filter Envelope Delay
28	23	223	0 - 127	Filter Envelope Attack
29	24	224	0 - 127	Filter Envelope Decay
30	25	225	0 - 127	Filter Envelope Sustain
31	26	226	0 - 127	Filter Envelope Release
32	27	227	0 - 127	VCA Initial Level
40	28	228	0 - 127	Output Spread
41	29	229	0 - 127	Voice Volume
33	30	230	0 - 127	VCA Envelope Amount
34	31	231	0 - 127	VCA Envelope Velocity Amount
35	32	232	0 - 127	VCA Envelope Delay
36	33	233	0 - 127	VCA Envelope Attack
37	34	234	0 - 127	VCA Envelope Decay
38	35	235	0 - 127	VCA Envelope Sustain
39	36	236	0 - 127	VCA Envelope Release

42	37	237	0 - 166	LFO 1 Frequency; 0 – 150 unsynced frequencies 151 Sequence speed divided by 32 152 Sequence speed divided by 16 153 Sequence speed divided by 8 154 Sequence speed divided by 6 155 Sequence speed divided by 4 156 Sequence speed divided by 3 157 Sequence speed divided by 2 158 Sequence speed divided by 1.5 159 One cycle per step 160 Two cycles per three steps 161 Two cycles per step 162 One cycles per three steps 163 Four cycles per step 164 Six cycles per step 165 Eight cycles per step 166 Sixteen cycles per step
43	38	238	0 - 4	LFO 1 Shape 0 Triangle 1 Reverse Sawtooth 2 Sawtooth 3 Pulse (square) 4 Random
44	39	239	0 - 127	LFO 1 Amount
45	40	240	0 - 43	LFO 1 Mod Destination; See Modulation Destination list below
46	41	241	0 - 1	LFO 1 Key Sync Off/On
47	42	242	0 - 166	LFO 2 Frequency; same as LFO 1
48	43	243	0 - 4	LFO 2 Shape; same as LFO 1
49	44	244	0 - 127	LFO 2 Amount
50	45	245	0 - 43	LFO 2 Mod Destination; See Modulation Destination list below
51	46	246	0 - 1	LFO 2 Key Sync Off/On
52	47	247	0 - 166	LFO 3 Frequency; same as LFO 1
53	48	248	0 - 4	LFO 3 Shape; same as LFO 1
54	49	249	0 - 127	LFO 3 Amount
55	50	250	0 - 43	LFO 3 Mod Destination; See Modulation Destination list below
56	51	251	0 - 1	LFO 3 Key Sync Off/On
57	52	252	0 - 166	LFO 4 Frequency; same as LFO 1
58	53	253	0 - 4	LFO 4 Shape; same as LFO 1
59	54	254	0 - 127	LFO 4 Amount
60	55	255	0 - 43	LFO 4 Mod Destination; See Modulation Destination list below
61	56	256	0 - 1	LFO 4 Key Sync Off/On
62	57	257	0 - 43	Envelope 3 Mod Destination; See Mod Destination list below
63	58	258	0 - 254	Envelope 3 Amount; -127 to +127
64	59	259	0 - 127	Envelope 3 Velocity Amount
65	60	260	0 - 127	Envelope 3 Delay

66	61	261	0 - 127	Envelope 3 Attack
67	62	262	0 - 127	Envelope 3 Decay
68	63	263	0 - 127	Envelope 3 Sustain
69	64	264	0 - 127	Envelope 3 Release
71	65	265	0 - 20	Mod 1 Source; See Modulation Source list below
72	66	266	0 - 254	Mod 1 Amount; -127 to +127
73	67	267	0 - 47	Mod 1 Destination; See Modulation Destination list below
74	68	268	0 - 20	Mod 2 Source; See Modulation Source list below
75	69	269	0 - 254	Mod 2 Amount; -127 to +127
76	70	270	0 - 47	Mod 2 Destination; See Modulation Destination list below
77	71	271	0 - 20	Mod 3 Source; See Modulation Source list below
78	72	272	0 - 254	Mod3 Amount; -127 to +127
79	73	273	0 - 47	Mod 3 Destination; See Modulation Destination list below
80	74	274	0 - 20	Mod 4 Source; See Modulation Source list below
81	75	275	0 - 254	Mod 4 Amount; -127 to +127
82	76	276	0 - 47	Mod 4 Destination; See Modulation Destination list below
107	77	277	0 - 47	Sequence 1 Destination; See ModDestination list below
108	78	278	0 - 47	Sequence 2 Destination; See ModDestination list below
109	79	279	0 - 47	Sequence 3 Destination; See ModDestination list below
110	80	280	0 - 47	Sequence 4 Destination; See ModDestination list below
83	81	281	0 - 254	Mod Wheel Amount; -127 to +127
84	82	282	0 - 47	Mod Wheel Destination; See ModDestination list below
85	83	283	0 - 254	Pressure Amount; -127 to +127
86	84	284	0 - 47	Pressure Destination; See ModDestination list below
87	85	285	0 - 254	Breath Amount; -127 to +127
88	86	286	0 - 47	Breath Destination; See ModDestination list below
89	87	287	0 - 254	Velocity Amount; -127 to +127
90	88	288	0 - 47	Velocity Destination; See ModDestination list below
91	89	289	0 - 254	Foot Control Amount; -127 to +127
92	90	290	0 - 47	Foot Control Destination; See ModDestination list below

101	91	291	30 - 250	BPM tempo
102	92	292	0 - 12	Clock Divide: Half Note Quarter Note Eighth Note Eighth Note half swing Eighth Note full swing Eighth Note triplets Sixteenth Note Sixteenth Note half swing Sixteenth Note full swing Sixteenth Note triplets Thirty-second Notes Thirty-second Notes triplets Sixty-Fourth note triplets
15	93	293	0 - 12	Pitch Bend Range
105	94	294	0 - 4	Sequencer Trigger: 0 Normal 1 Normal, no reset 2 No gate 3 No gate/no reset 4 key step
94	95	295	0 - 5	Key Mode: 0 Low note priority 1 Low note priority with re-trigger 2 High note priority 3 High note priority with re-trigger 4 Last note hit priority 5 Last note hit priority with re-trigger
93	96	296	0 - 4	Unison Mode: 0 1 voice 1 All voices 2 All voices detune1 3 All voices detune2 4 All voices detune3
103	97	297	0 - 3	Arpeggiator Mode: 0 Up 1 Down 2 Up/Down, 3 Assign 4 Random 5 2 Octaves Up 6 2 Octaves Down 7 2 Octaves Up/Down 8 2 Octaves Assign 9 2 Octaves Random 10 3 Octaves Up 11 3 Octaves Down 12 3 Octaves Up/Down 13 3 Octaves Assign 14 3 Octaves Random
70	98	298	0 - 1	Envelope 3 Repear Mode; off/on
95	99	299	0 - 1	Unison; off/on

104	100	300	0 - 1	Arpeggiator; off/on
106	101	301	0 - 1	Gated Sequencer; off/on
111	105	X	0 - 183	Assignable Parameter 1
112	106	X	0 - 183	Assignable Parameter 2
113	107	X	0 - 183	Assignable Parameter 3
114	108	X	0 - 183	Assignable Parameter 4
19	110	310	0 - 127	Feedback Gain
96	111	311	0 - 127	Push It Note: C0 to C10
97	112	312	0 - 127	Push It Velocity
98	113	313	0 - 1	Push It Mode: Normal, Toggle
5	114	314	0 - 127	Sub Oscillator 1 Level
11	115	315	0 - 127	Sub Oscillator 2 Level
18	116	316	0 - 127	Feeback Volume
117	117	X		Editor Byte
99	118	X	0 - 127	Split Point; 60 = C3
100	119	X	0 - 2	Keyboard Mode: Normal Stack Split
120	120-135	320-335	0 - 127	Sequence Track1, steps 1 – 16 0 to 125: Normal sequence step value 126 Reset 127 Rest
136	136-151	336-351	0 - 126	Sequence Track 2, steps 1 – 16 0 to 125: Normal sequence step value 126 Reset
152	152-167	352-367	0 - 126	Sequence Track 3, steps 1 – 16 0 to 125: Normal sequence step value 126 Reset
168	168-183	368-383	0 - 126	Sequence Track 4, steps 1 – 16 0 to 125: Normal sequence step value 126 Reset
184	184-199	X	32 - 127	Name charaters 1 – 16, in ASCII format

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

Mod Destinations	Value
Off	0
Osc 1 Freq	1
Osc 2 Freq	2
Osc 1 and 2 Freq	3
Osc Mix	4
Noise Level	5
Osc 1 Pulse Width	6
Osc 2 Pulse Width	7
Osc 1 and 2 Pulse Width	8
Filter Frequency	9
Resonance	10
Filter Audio Mod Amt	11
VCA Level	12
Pan Spread	13
LFO 1 Freq	14
LFO 2 Freq	15
LFO 3 Freq	16
LFO 4 Freq	17
All LFO Freq	18
LFO 1 Amt	19
LFO 2 Amt	20
LFO 3 Amt	21
LFO 4 Amt	22
All LFO Amt	23
Filter Env Amt	24
Amp Env Amt	25
Env 3 Amt	26
All Env Amounts	27
Env 1 Attack	28
Env 2 Attack	29
Env 3 Attack	30
All Env Attacks	31
Env 1 Decay	32
Env 2 Decay	33
Env 3 Decay	34
All Env Decays	35
Env 1 Release	36
Env 2 Release	37
Env 3 Release	38
All Env Releases	39
Mod 1 Amt	40
Mod 2 Amt	41
Mod 3 Amt	42
Mod 4 Amt	43
Feedback Volume	44
Sub Osc 1 Level	45
Sub Osc 2 Level	46
Feedback Gain	47
Slew*	48

*Sequence 2 and 4 only

Mod Sources	Value
Off	0
Sequence Track 1	1
Sequence Track 2	2
Sequence Track 3	3
Sequence Track 4	4
LFO 1	5
LFO 2	6
LFO 3	7
LFO 4	8
Filter Envelope	9
Amp Envelope	10
Envelope 3	11
Pitch Bend	12
Mod Wheel	13
Pressure	14
MIDI Breath	15
MIDI Foot	16
MIDI Expression	17
Velocity	18
Note Number	19
Noise	20

Combo Parameter Data

Combo Mode has its own set of NRPNs that enable the parameters for each of the combo's parts to be addressed on one global MIDI channel. Ranges are the same as for the previously listed program parameters.

Note: In Multi Mode, the regular, program NRPNs are received and transmitted for each of the four voices on their separate MIDI channels.

Quad NRPNs come from/go to all four voices in a combo.

Parm	Parameter	1	2	3	4	Quad
0	OSC 1 FREQ	512	768	1024	1280	1536
1	OSC 1 FREQ FINE	513	769	1025	1281	1537
2	OSC 1 SHAPE	514	770	1026	1282	1538
3	GLIDE 1	515	771	1027	1283	1539
4	OSC 1 KEY	516	772	1028	1284	1540
6	OSC 2 FREQ	517	773	1029	1285	1541
7	OSC 2 FREQ FINE	518	774	1030	1286	1542
8	OSC 2 SHAPE	519	775	1031	1287	1543
9	GLIDE 2	520	776	1032	1288	1544
10	OSC 2 KEY	521	777	1033	1289	1545
12	SYNC	522	778	1034	1290	1546
13	GLIDE MODE	523	779	1035	1291	1547
14	OSC SLOP	524	780	1036	1292	1548
16	OSC MIX	525	781	1037	1293	1549
17	NOISE LEVEL	526	782	1038	1294	1550
20	FILTER FREQ	527	783	1039	1295	1551
21	RESONANCE	528	784	1040	1296	1552
22	FIL KEY AMT	529	785	1041	1297	1553
23	FIL AUDIO MOD	530	786	1042	1298	1554
24	FILTER POLES	531	787	1043	1299	1555
25	FILTER ENV AMT	532	788	1044	1300	1556
26	FIL ENV VEL AMT	533	789	1045	1301	1557
27	FIL DEL	534	790	1046	1302	1558
28	FIL ATT	535	791	1047	1303	1559
29	FIL DEC	536	792	1048	1304	1560
30	FIL SUS	537	793	1049	1305	1561
31	FIL REL	538	794	1050	1306	1562
32	VCA LEVEL	539	795	1051	1307	1563
40	OUTPUT PAN	540	796	1052	1308	1564
41	PRESET VOLUME	541 (A)	X	1053 (B)	X	X
33	VCA ENV AMOUNT	542	798	1054	1310	1566

34	VCA ENV VEL AMT	543	799	1055	1311	1567
35	VCA DEL	544	800	1056	1312	1568
36	VCA ATT	545	801	1057	1313	1569
37	VCA DEC	546	802	1058	1314	1570
38	VCA SUS	547	803	1059	1315	1571
39	VCA REL	548	804	1060	1316	1572
42	LFO 1 FREQ	549	805	1061	1317	1573
43	LFO 1 SHAPE	550	806	1062	1318	1574
44	LFO 1 AMT	551	807	1063	1319	1575
45	LFO 1 DEST	552	808	1064	1320	1576
46	LFO 1 SYNC	553	809	1065	1321	1577
47	LFO 2 FREQ	554	810	1066	1322	1578
48	LFO 2 SHAPE	555	811	1067	1323	1579
49	LFO 2 AMT	556	812	1068	1324	1580
50	LFO 2 DEST	557	813	1069	1325	1581
51	LFO 2 SYNC	558	814	1070	1326	1582
52	LFO 3 FREQ	559	815	1071	1327	1583
53	LFO 3 SHAPE	560	816	1072	1328	1584
54	LFO 3 AMT	561	817	1073	1329	1585
55	LFO 3 DEST	562	818	1074	1330	1586
56	LFO 3 SYNC	563	819	1075	1331	1587
57	LFO 4 FREQ	564	820	1076	1332	1588
58	LFO 4 SHAPE	565	821	1077	1333	1589
59	LFO 4 AMT	566	822	1078	1334	1590
60	LFO 4 DEST	567	823	1079	1335	1591
61	LFO 4 SYNC	568	824	1080	1336	1592
62	ENV3 DEST	569	825	1081	1337	1593
63	ENV3 AMT	570	826	1082	1338	1594
64	ENV 3 VEL AMT	571	827	1083	1339	1595
65	ENV 3 DELAY	572	828	1084	1340	1596
66	ENV3 ATT	573	829	1085	1341	1597
67	ENV3 DEC	574	830	1086	1342	1598
68	ENV3 SUS	575	831	1087	1343	1599
69	ENV3 REL	576	832	1088	1344	1600
71	MOD SOURCE 1	577	833	1089	1345	1601
72	MOD AMT 1	578	834	1090	1346	1602
73	MOD DEST 1	579	835	1091	1347	1603
74	MOD SOURCE 2	580	836	1092	1348	1604
75	MOD AMT 2	581	837	1093	1349	1605
76	MOD DEST 2	582	838	1094	1350	1606

77	MOD SOURCE 3	583	839	1095	1351	1607
78	MOD AMT 3	584	840	1096	1352	1608
79	MOD DEST 3	585	841	1097	1353	1609
80	MOD SOURCE 4	586	842	1098	1354	1610
81	MOD AMT 4	587	843	1099	1355	1611
82	MOD DEST 4	588	844	1100	1356	1612
107	SEQ 1 DEST	589	845	1101	1357	1613
108	SEQ 2 DEST	590	846	1102	1358	1614
109	SEQ 3 DEST	591	847	1103	1359	1615
110	SEQ 4 DEST	592	848	1104	1360	1616
83	MOD WHEEL AMT	593	849	1105	1361	1617
84	MOD WHEEL DEST	594	850	1106	1362	1618
85	PRESSURE AMT	595	851	1107	1363	1619
86	PRESSURE DEST	596	852	1108	1364	1620
87	BREATH AMT	597	853	1109	1365	1621
88	BREATH DEST	598	854	1110	1366	1622
89	VELOCITY AMT	599	855	1111	1367	1623
90	VELOCITY DEST	600	856	1112	1368	1624
91	FOOT AMT	601	857	1113	1369	1625
92	FOOT DEST	602	858	1114	1370	1626
101	TEMPO	603	859	1115	1371	1627
102	TIME SIG	604	860	1116	1372	1628
15	PBEND RANGE	605	861	1117	1373	1629
105	SEQ TRIGGER	606	862	1118	1374	1630
93	UNISON MODE	607	X	X	X	X
94	UNISON ASSIGN	608	864	1120	1376	1632
97	ARP MODE	609	X	X	X	X
70	REPEAT MODE	610	866	1122	1378	1634
95	UNISON ON OFF	611	867	1123	1379	1635
104	ARP ON OFF	612	X	X	X	X
106	SEQ ON OFF	613	869	1125	1381	1637
111	PARAM ENC SEL V1	617	X	X	X	X
112	PARAM ENC SEL V2	618	X	X	X	X
113	PARAM ENC SEL V3	619	X	X	X	X

114	PARAM ENC SEL V4	620	X	X	X	X
19	FEEDBACK GAIN	622	878	1134	1390	1646
96	PUSH IT NOTE	623	879	1135	1391	1647
97	PUSH IT VELOCITY	624	880	1136	1392	1648
98	PUSH IT MODE	625	881	1137	1393	1649
5	SUB OSC 1 VOL	626	882	1138	1394	1650
11	SUB OSC 2 VOL	627	883	1139	1395	1651
18	FEEDBACK VOL	628	884	1140	1396	1652
117	EDITOR BYTE	629				
120	SEQ 1	632 – 647	888 – 903	1144 – 1159	1400 – 1415	1656 – 1671
136	SEQ 2	648 – 663	904 – 919	1160 – 1175	1416 – 1431	1672 – 1687
152	SEQ 3	664 – 679	920 – 935	1176 – 1191	1432 – 1447	1688 – 1703
168	SEQ 4	680 – 695	936 – 951	1192 – 1207	1448 – 1463	1704 – 1719
	COMBO NAME	696 – 712	X	X	X	X

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)

Tetra 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 0110	Tetra 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
0000 0000	Zero Byte
0000 0000	Zero Byte
1111 0111	End of Exclusive (EOX)

Request Program Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0110	Tetra ID
0000 0101	Request Program Transmit
0000 00vv	Bank Number, 0 — 1
0vvv vvvv	Program Number, 0 — 127
1111 0111	End of Exclusive (EOX)

Tetra 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 0110	Tetra ID
0000 0110	Request Program Edit Buffer Transmit
1111 0111	End of Exclusive (EOX)

Tetra 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 0110	Tetra ID
0000 1110	Request Global Parameter Transmit
1111 0111	End of Exclusive (EOX)

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

Request Combo Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0110	Tetra ID
0010 0001	Request Combo Transmit
0vvv vvvv	Combo Number, 0 - 127
1111 0111	End of Exclusive (EOX)

Tetra will respond by sending out the Combo Data in the format described below in *Combo Data Dump*.

Request Combo Edit Buffer Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0110	Tetra ID
0011 1000	Request Combo Edit Buffer Transmit
1111 0111	End of Exclusive (EOX)

Tetra will respond by sending out the Combo Data in the format described below in *Combo Edit Buffer Data Dump*.

Program Data Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0110	Tetra ID
0000 0010	Program Data
0000 00vv	Bank Number, 0 - 3
0vvv vvvv	Program Number, 0 - 127
0vvv vvvv	384 bytes expanded to 446 MIDI bytes in “packed MS bit” format (see page 66.)
1111 0111	End of Exclusive (EOX)

Program Edit Buffer Data Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0110	Tetra ID
0000 0011	Edit Buffer Data
0vvv vvvv	384 bytes expanded to 446 MIDI bytes in “packed MS bit” format (see page 66.)
1111 0111	End of Exclusive (EOX)

Combo Data Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0110	Tetra ID
0010 0010	Combo Data
0vvv vvvv	Combo Number, 0 - 127
0vvv vvvv	1024 bytes expanded to 1177 MIDI bytes in “packed MS bit” format (see page 66.)
1111 0111	End of Exclusive (EOX)

Combo Edit Buffer Data Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0110	Tetra ID
0011 0111	Edit Buffer Data
0vvv vvvv	1024 bytes expanded to 1177 MIDI bytes in “packed MS bit” format (see page 66.)
1111 0111	End of Exclusive (EOX)

Global Parameters Data Dump

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0110	Tetra ID
0000 1111	Main Parameter Data
0vvv vvvv	20 nibbles (LS then MS) for 10 Global parameters. Global Parameters are listed starting on page 51.
1111 0111	End of Exclusive (EOX)

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

Mode Change: Program Mode

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0110	Tetra ID
0011 0000	Select Program Mode
1111 0111	End of Exclusive (EOX)

Mode Change: Combo Mode

Status	Description
1111 0000	System Exclusive (SysEx)
0000 0001	DSI ID
0010 0110	Tetra ID
0011 0001	Select Combo Mode
1111 0111	End of Exclusive (EOX)

Packed Data Format

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

Example:

Input Data

```
1 A7 A6 A5 A4 A3 A2 A1 A0
2 B7 B6 B5 B4 B3 B2 B1 B0
3 C7 C6 C5 C4 C3 C2 C1 C0
4 D7 D6 D5 D4 D3 D2 D1 D0
5 E7 E6 E5 E4 E3 E2 E1 E0
6 F7 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 293 MIDI bytes to transmit 256 Program data bytes.

Hidden Functions

Hold the ASSIGN PARAMETERS switch and hit the Mode switch to calibrate the low-pass filter and analog oscillator waveshapes. This should not be necessary for normal operation.

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