TEMPEST

ANALOG DRUM MACHINE

Operation Manual

Dave Smith INSTRUMENTS

with *Roger Linn* DESIGN

TEMPEST
A N A L O G   D R U M   M A C H I N E

Operation Manual

by Roger Linn and Andrew McGowan

Version 1.0
September 2011

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FC Tested To Comply
With FCC Standards
FOR OFFICE USE

C E

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Credits and Acknowledgement

For their samples, thanks to:

Angus Hewlett/FXpansion
Audio samples © 2007 FXpansion Audio UK Ltd. Used with permission.
www.fxpansion.com

Hugo Tichborne/Goldbaby
www.goldbaby.co.nz

Haptic Audio
www.hapticaudio.com

For Sound and Beat design:

Robert Baker	Jeremy Jacobs
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Kosta Cross	Nathan Kampf
Carson Day	James Kojac
Richard Devine	Kevin Lamb
Michael Dietel	Joe McGinty
Peter Dyer	Chris Randall
Shane Etter	Robert Rich
Andrew Everding	Brian Tester
Troels Folmann	Jason Ware
Reek Havok	

Special thanks also to: Wade Dawson, Rory Dow, Peter Molettiere, and Riley Smith

And to the DSI crew: Chris Hector, Tony Karavidas, Mark Kono, Andrew McGowan, Joanne McGowan, and Tracy Wadley.

What's a Tempest?

Tempest is a professional drum machine that generates its sounds using six powerful analog synthesis voices. It runs an innovative, performance-oriented operating system that permits an extraordinary level of control to create, edit, arrange, and manipulate beats and sounds in real time without ever stopping play. We like to think of Tempest not just as a drum machine but rather as a new musical instrument for the real-time performance of beat-oriented music.

Here is a summary of some of Tempest's innovative features:

- Complex and rich analog voice structure: two analog plus two digital oscillators (with a large bank of included samples), lowpass filter with audio-rate modulation, highpass filter, VCA with feedback, five envelopes, two LFOs, and eight flexible modulation paths. Though optimized for drum sounds, it excels at tuned sounds as well, and even doubles as a 6-voice analog keyboard synth. In addition to the six direct voice outputs, there are stereo mix outputs and phones outputs, plus two inputs for foot switches or expression pedals, MIDI in/out, and USB.

- The performance-oriented operating system, ninety panel controls, and graphic OLED display work together to provide a tightly integrated, fast, non-stop workflow in which nearly all creation, editing, arrangement, and manipulation operations occur in real-time without stopping play. A high priority was given to producing the highest quality human feel, including the ability to adjust swing timing in real time on playback.

- Sixteen pressure- and velocity-sensitive lit pads are arranged in a 2x8 configuration, providing easy access to all fingers and providing the ideal compromise between the popular 4x4 and 1x16 arrangements for both real-time and step programming. The pads can be used to play sixteen drumbeats, sixteen sounds (for each of two banks), sixteen sound mutes, sixteen velocity levels, or sixteen time steps (for step programming). The ROLL button permits creating drum rolls or repeated groove patterns by varying pad pressure during record, and doubles as a momentary "stutter" effect when the pads are assigned to play beats.

- Two pressure- and position-sensitive Real Time FX slide controllers permit real-time recording of note or beat-wide sound parameter changes into the drumbeat as you play. Real-time effects include stereo analog distortion and compression, plus audio delay and beat "stutter", both produced in the sequencer in order to maintain the pure analog signal path.

Quick Start

The best way to get started is to watch our Tempest Quick Start video, presented by Roger Linn. Visit www.davesmithinstruments.com/products/tempest/ to see this and other helpful videos.

Overview of Panel Controls

Hold either Shift key to select the alternate function printed below some controls.

Connect stereo outputs or 6 direct voice outputs to mixer.

Connect power supply.

Adjust synthesis settings of last sound pad hit

Adjust mix settings of last played sound pad.

Graphic OLED screen, 4 Soft Knobs, 1 Soft Key, screen navigation keys, Shift and Transport keys.

Set Tempo, Distortion, Compression, and Main Volume.

Use position and pressure sensitive touch strips to record sound parameter changes in real-time.

The 16 pads can be used to play 16 drumbeats, 16 sounds, 16 time steps, for step record, 16 tunings, 16 mutes, or 16 volume levels.

Select Bank A or B sounds, Roll for repeating notes or beat stutter, Fixed Level to defeat touch sensitivity, or Reverse to play backwards.

Select what's on the screen: the functions of the pads, a grid showing drumbeat or play list events, Sound settings, or Mixer settings. Play List plays a programmed list of beats.

Quickly erase or copy sounds or beats, undo last edit, turn click on/off, a menu of editing functions, save/load to internal flash or MIDI/USB, and system settings.

Sounds, Beats, and Projects

There are three terms that are important to know:

A **Sound** is a collection of all settings required to produce a drum or other type of sound when you play a pad, including settings for samples, oscillators, filters, VCA, envelopes, LFOs, and more. If the 16 Sounds key is pressed, you can use the sixteen pads to play the Sound in the selected Beat. After you create a Sound, you can save it as a Sound file for later reloading into another Beat.

A **Beat** is a collection of all settings needed to produce a drumbeat—a note sequence up to four measures of 4/4 time, thirty-two Sounds (sixteen in pad bank A and sixteen in pad bank B), mixer settings, effect settings, and more. Tempest holds sixteen beats in memory at one time. If the 16 Beats key is pressed, you can use the sixteen pads to play the sixteen Beats that are loaded in memory. After you create a Beat, you can save it as a Beat file for later reloading into another project.

A **Project** is a collection of nearly everything in memory: all sixteen Beats (each containing its own thirty-two Sounds), ten Play Lists, and various project-related settings including the playing tempo.

Going Deeper

There is important information throughout the manual, but pay particular attention to "The Pad Function Keys" on page 4 to gain a greater understanding of Tempest's pad modes and how to use them, and "The Screens Keys" on page 11 to learn how to access and interact with the various types of data on the graphic display. It is highly recommended to read "Save/Load" on page 39. It is *extremely* important and could save you a lot of grief!

The Pad Function Keys

16 Beats

If 16 BEATS is pressed, the sixteen pads are used to play the sixteen Beats in memory. This is useful for live arrangement and manipulation of Beats during performance. One beat pad is always selected, indicated by its pad being dimly lit. To start playing a Beat, press PLAY. While playing, select another beat pad to switch to it. To stop playing, press STOP.
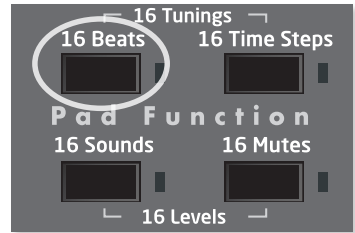
If the PADS key (in the Screens section) is lit, the following screen will be displayed, showing the beat assigned to each pad, plus related information and controls:

Soft Knob 1: Beat Quantize
When switching between beat pads while playing, the transition will be delayed until the next bar, ½ note, etc., set here.

Soft Knob 2: Swing
Varies the selected Beat's 1/16 note Swing amount from 50% (straight 1/16s) to 66% (triplet swing) and more.

Soft Knob 4: Beat Roll
Hold the Roll key for a Beat Roll, a stutter effect in which a small portion of the beat loops. This setting controls the duration of the beat roll.

Project & Beat
Displays the current Project name (everything in memory) and selected Beat name.

Soft Key: Pad Hold
If on, beats play only as long as you hold down a beat pad. The Play key is also momentary.

Short Names
Short names for each of the 16 pads are shown here. You can edit these short names by using the Edit function.

16 Sounds

If 16 Sounds is pressed, the sixteen pads are used to play the sixteen Sounds (in either Bank A or B) of the selected Beat. This is useful for playing sounds, or for recording sounds into beats in real time.

If the Pads key (in the Screens section) is lit, the following screen will be displayed, showing what's in each pad and other useful controls:
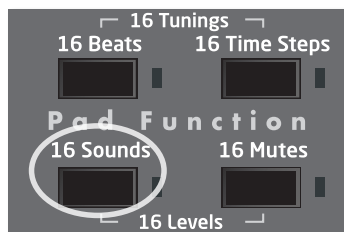
Soft Knob 1: Quantize
When recording Beats in real time, notes are moved to the nearest 1/8, 1/16 note, etc., set here. This is also used for the Note Roll rate, plus the step size for the 'Beat Events' screen and the '16 Time Steps' pad function.

Soft Knob 2: Swing
Varies the selected Beat's 1/16 note Swing amount from 50% (straight 1/16s) to 66% (triplet swing) to 75% (extreme swing). 54-58% gives a relaxed 1/16 feel.

Soft Knob 3: Sound Type
The center area shows the Sound Types (Kick, Snare, etc.) for the 16 Sounds in the selected bank. This knob permits changing the assigned sound type.

Quant: 16th	Swing: 50.0%	Sound Type	Load Sound

Bt: 14/Swing beat 100 bpm   Snd: A12/Boomy Kick

Tamb	Claps	Rim	Snare	HhOpn	TomHi	TomMid	TomLo
Shaker	Block	SftSnr	Kick	HhTite	Ride	Crash	Splash

	120.0		1.1.01	16 Sounds

Selected Beat & Sound
Displays the pad number and name of the currently selected Beat and Sound.

One sound pad is always selected, indicated by being dimly lit. Press a pad to select it, or Shift+pad to select it without hearing its sound. The sound controls in the upper half of the panel (oscillators, filters, mixer, etc.), always apply to the selected sound.

Note the arrangement of sound types in the above screen, which is optimized for playing the drum kit sounds with your hands placed in the center of the pads. We suggest that you create your beats using this same arrangement.

16 Mutes

If 16 Mutes is pressed, the sixteen pads act as sixteen mute switches for playback of the sixteen Sounds in the selected Sound bank (A or B). This is useful for arranging the Beat's parts in real time while playing. A lit pad indicates the Sound's playback is on; an unlit pad indicates it is off. Pressing a pad toggles between on and off states.
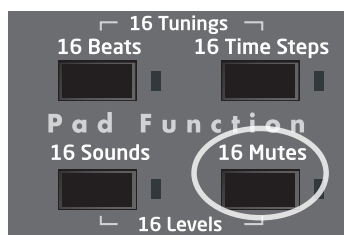
If the Pads key (in the Screens section) is lit, the following screen will be displayed, showing the assignment of each pad and related controls:

Beat & Sound
Displays the selected Beat and Sound. To change the selected sound, hold Shift while pressing the pad that holds the desired sound in the 16 Sounds screen.

Soft Knob 2: Swing
Varies the selected Beat's 1/16 note Swing amount from 50-75%.

```
                    Swing:54%
Bt: 14/Swing beat 100 bpm    Snd: A12/Boomy Kick
 Tom1  Tom2  Tom3  Snare  HatOp  Snar2  Shaker  Tamb
Splash Crash  Ride  Bass   HatC1  Bass2  Claps  Clave
     All On        120.0       1.1.01      16 Mutes
```

Soft Key: All On
Pressing this soft key unmutes all 16 Sounds in the active bank.

Sound Types
The center area shows the Sound Types for the 16 loaded Sounds, which can be changed in the 16 Sounds screen.

16 Time Steps

If 16 TIME STEPS is pressed, the sixteen pads represent sixteen time steps within the beat, useful for step programming. A lit pad indicates the presence of a note of the selected sound, and an unlit pad indicates its absence. Pressing a lit pad toggles between deleting and inserting a note (of the selected sound) at the pad's assigned location in time.
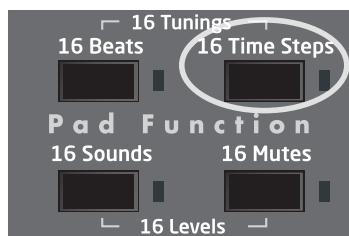
If the PADS key (in the Screens section) is lit, the following screen will be displayed, showing the assignment of each pad plus related controls:

Soft Knob 1: Quantize
Same as the Quantize setting in the 16 Sounds screen, in this case it sets the Time Step size for the 16 pads to a value between 8th notes through 32nd triplets.

Soft Knob 2: See
The screen can show only a portion of the entire beat. For example, if Quantize=16th, the 16 pads show 1 bar of 4/4. Turning this knob moves between displaying (seeing) sequential time blocks within the beat. The circular icon at right appears if LoopScreen is on.

Shift + Soft Knob 2: LoopScreen
If on, the time steps shown in the screen are played in a loop.

Selected Beat & Sound
Displays the pad number and name of the currently selected Beat and Sound.

Note that it is often more useful to view the Beat Events screen while step programming your beats.

16 Tunings

If 16 TUNINGS is selected (by pressing the 16 BEATS and 16 TIME STEPS keys together), the sixteen pads play the selected sound at sixteen different tunings. This is useful for playing tuned parts like bass or melody lines.

If the PADS key (in the Screens section) is selected, the following screen is displayed, showing the unique tuning for each pad plus related controls:

Soft Knob 1: Scale
Offers a variety of musical scales for the 16 pads (major, minor, chromatic, etc.)

Soft Knob 2: Octave
Permits the pads' tuning to be shifted up or down in octaves.

Soft Knob 3: Transpose
Selects the root note of the scale.

Beat & Sound
Displays the selected Beat and Sound. To change the selected sound (the sound that plays at the 16 tunings), hold Shift while pressing the pad that holds the desired sound in the 16 Sounds screen.

Pad Tunings
Shows the tuning for each of the 16 pads in the selected scale.
Note that these won't be the actually notes played but rather serves to indicate the relative tuning between scale notes.

16 Levels

If 16 LEVELS is selected (by pressing 16 SOUNDS and 16 MUTES together), the sixteen pads play a single Sound at sixteen evenly spaced volume (velocity) levels. This is an alternative to using the pads' touch sensitivity for playing and recording dynamics.

If the PADS key (in the Screens section) is lit, the following screen will be displayed, showing the velocity level for each pad plus related controls:

Soft Knob 1:
Quantize
When recording Beats in real time, notes are moved to the nearest 1/8, 1/16 note, etc., set here. This is also used for the Note Roll rate, plus the step size for the 'Beat Events' screen and the '16 Time Steps' pad function.

Soft Knob 2:
Swing
Varies the selected Beat's 1/16 note Swing amount from 50% (straight 1/16s) to 66% (triplet swing) and more. 54-58% gives a relaxed 16th note feel.

Beat & Sound
Displays the selected Beat and Sound. To change the selected sound (the sound that plays at the 16 tunings), hold Shift while pressing the pad that holds the desired sound in the 16 Sounds screen.

Velocity Levels
Shows the velocity level at which each of the 16 pads will play the selected sound.

Pad Options

The buttons in this section provide a variety of useful tricks to get the most out of using the pads for playing both sounds and beats.

Sound Bank B
This key is not implemented in the initial release of the software.

Reverse
This key is not implemented in the initial release of the software.

Sound Bank B

Reverse

Pad Options
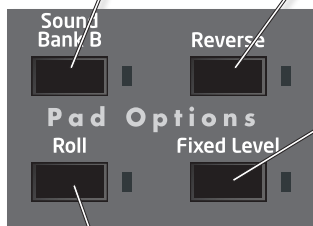
Roll

Fixed Level

Fixed Level
If off, sound pads are touch-sensitive, playing louder when hit harder. If on, sounds always play at a fixed velocity level, set in the System settings.

Roll
If Pad Function = 16 Sounds, 16 Tunings or 16 Volumes:
While playing, if Roll is on and a sound pad is held, repeated notes will be created at the Quantize rate (Set in the 16 Sounds screen). Varying pad pressure varies the velocity level of the repeated notes. Use 1/32 or 1/32 Triplet quantize for rolls, or 1/16 note quantize for natural-sounding 1/16 note hihat parts.

If Pad Function = 16 Beats:
If Roll key is held, the beat stutters, looping a short portion until released. The roll rate of repeat is set by the Beat Roll setting in the 16 Beats screen.
(Select 16 Beats and Pads.)

The Screens Keys

Tempest's graphic OLED screen can display a variety of different types of information. The keys in this section are used to determine which information it displays.

The Events key
This displays the Beat Events screen, containing a grid view of the beat's note events. This is described on the following page.

The Play List key
The Play List function is not implemented in the initial software release.

Play List   Events

S c r e e n s
Pads   Sounds

Mixer

The Play List key
A 2 x 8 matrix is displayed, showing the function of each of the 16 pads. Different information is displayed depending on which of the 6 Pad Functions is selected. See the description of each Pad Function to learn about each screen.

The Mixer
(press Pads and Sounds together)
One of four screens is displayed, showing the various mix parameters. To see and learn about these screens, read the Mixer Controls section of the manual.

The Sounds key
One of many screens is displayed, showing the various parameters for oscillators, filters, VCA, envelopes, LFO and modulation paths. To see and learn about these screens, read the Sound Controls section of the manual.

Events Key: The Beat Events screen

If the EVENTS key is pressed, the Beat Events screen will be displayed. The Beat Events screen is used for visual programming and editing of beats.

The Beat Events screen contains a 4 x 16 grid with a row for each of four Sounds in the Beat, and sixteen columns representing sixteen time locations within the Beat. A rectangle in one of the cells indicates the presence of a note event of the row's Sound at the column's time location. The height of this rectangle indicates the velocity level of the note.

The grid acts as a window into the larger beat, showing four Sounds/rows out of thirty-two, and sixteen time locations from the total Beat's length. To view the previous or next block of time, press the PAGE UP or PAGE DOWN keys. To view higher or lower rows of Sounds, turn the ROW soft knob.

To Edit a Note Event:

1. Press SHIFT + turn Soft Knob 3 (Quantize) to adjust the size of each time step (column) from 8th notes to 32nd triplets.

2. Use the ROW and COLUMN soft knobs to select the note's row and column.

3. Use the SELECT PARAM Soft Knob to select which of the note parameters you wish to view for editing: Velocity, Duration, Tuning, Note FX1, Note FX2, Note FX3, Note FX4, or Offset (time shift).

4. The selected parameter of the selected note will appear in the Soft Knob 4 rectangle. Edit the value with Soft Knob 4.

5. To play only the displayed region in a loop, hold SHIFT and turn Soft Knob 2 to the right to turn on Loop Screen.

6. The Soft Key is used either to insert a new note in an empty cell, or to delete an existing note.

Note that the Beat Events screen can be displayed while any of the six Pad Functions is selected. It is especially useful for step programming when Pad Function is set to 16 TIME STEPS.

Soft Knob 1: Row
The 4 rows of the grid represent 4 of the beat's sound pads. Turn this knob (or press the Up/Down Arrow keys) to select a different row. If turned past the bottom or top of the screen, the screen scrolls up or down to reveal higher/lower sound pads.

Shift + Soft Knob 1: Assign Row
Often the 4 sounds you wish to edit aren't contiguous and therefore can't all be edited in the same screen. Turning this knob permits the selected row to be reassigned to any of the 32 sound pads.

Soft Knob 2: Column
The columns represent time locations. Turn this knob (or press the left/right arrow keys) to select a time location, shown as a bar.beat.tick number in the Soft Knob 2 rectangle. To view the previous or next block of time, press the Page Up/Down keys. The circular icon indicates the LoopScreen status.

Shift + Soft Knob 2: Loop Screen
If on, the contents of the screen plays in a loop, useful for fast editing. If on, the LoopScreen icon appears whether Shift is on or off.

```
[   Row: 2   ][ Col: 1.1.1 ⟳][Select Param][   Vel: 67   ]
A1/HatOpn
A2/HatCls
A3/Snare
A4/Bass
[   Insert   ][   120.0   ][   1.2.01   ][ Beat Events ]
```
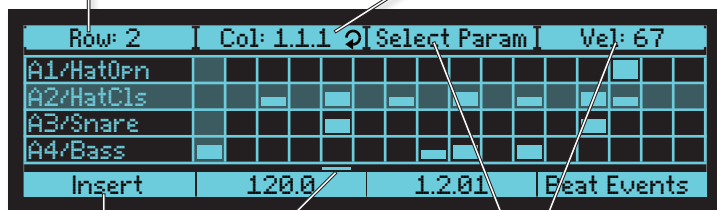
Soft Key:
Insert or Delete
If no note exists at the selected grid cell, this key inserts a new note. If a note exists in the selected cell, it deletes it.

The Play Cursor
This horizontal line moves as the beat plays, indicating the current playing location (same as the Location display) within the beat.

Soft Knobs 3 & 4: Select Param & Edit
Each note event contains 8 data: velocity, tuning, duration, timeshift, FX1, FX2, FX3 and FX4. To edit the note event at the intersection of the selected row and column, use soft knob 3 to select one of these 8 parameters, then use soft knob 4 to edit the current value of the selected parameter.

Shift + Soft Knobs 3&4: Quantize & Swing
Quantize sets the time resolution of the grid, from 8th notes to 32nd triplets. Triplet values show 12 columns instead of 16. This also sets the note value for real time quantize recording, Note Roll and the 16 Time Step pad function.

The Sound Controls

A Sound is a collection of all settings required to produce a drum or other type of sound when you play a pad, including samples, oscillators, filters, envelopes, LFOs, and more. This section provides a detailed description of each of these settings, and is divided into subsections for each of the principal synthesis blocks:

- Oscillators

- Lowpass Filter

- Highpass Filter

- VCA (voltage controlled amplifier)

- Envelope generators

- LFOs (low frequency oscillators)

- Modulation paths

Many of these parameters have dedicated front panel controls, but many others are accessed only in special Sounds screens. All sound parameters can be visually edited by pressing the Sounds key (in the Screens section.)
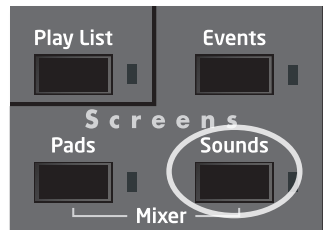
There are a total of sixteen different sound parameter screens. To move between them, press the four arrow keys.

On the following two pages is a picture of all sixteen screens, with arrows showing which arrow keys to use to move between them. On subsequent pages is a detailed description of each of the parameters shown in these screens.

If the Sounds key is pressed, one of the following screens appears.

Use the four arrow keys to move between the screens.

Shape	Osc 1/2 Mix	Frequency	Fine Freq
Bt: 14/Swing beat 100 bpm   Snd: A12/Boomy Kick

Triangle ○ 49/51 ○ C#2 ○ +.53
SHAPE OSC 1/2 MIX FREQUENCY FINE FREQ
120.0   1.1.1   OSC1

Glide	Sync 2->1
Bt: 14/Swing beat 100 bpm

○ 100 ▭
GLIDE SYNC 2->1
120.0

Sample	Volume	Frequency	Fine Freq
Bt: 14/Swing beat 100 bpm   Snd: A12/Boomy Kick

Pink Noise ○ 87 ○ +5.12 ○ +5.12
SAMPLE VOLUME FREQUENCY FINE FREQ
120.0   1.1.1   OSC3

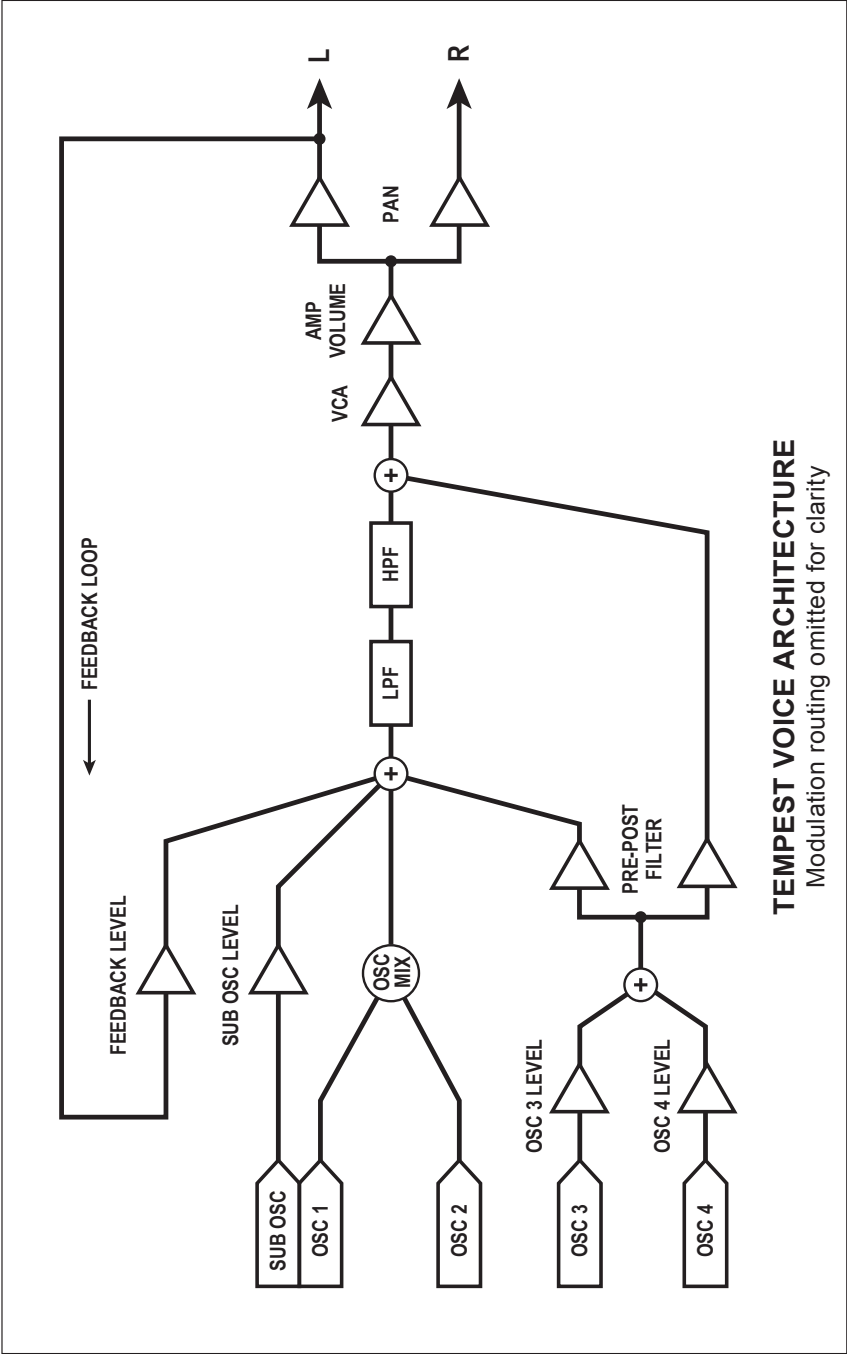| Glide	Pre
Bt: 14/Swing beat 100 bpm   Snd:

○ 100
GLIDE
120.0

LP Freq	Resonance	Audio Mod	HP Freq
Bt: 14/Swing beat 100 bpm   Snd: A12/Boomy Kick

○ D#3 ○ 87 ○ 34 ○ 34
LP FREQ RESONANCE AUDIO MOD HP FREQ
▭ 4 POLE
120.0   1.1.1   Filters

LP Key>Freq
Bt: 14/Swing beat 100 bpm   Snd

○ 100
LP KEY>FREQ
120.0

Volume	VCA Level	Feedback
Bt: 14/Swing beat 100 bpm   Snd: A12/Boomy Kick

○ D#3 ○ 31 ○ 31
VOLUME VCA LEVEL FEEDBACK
120.0   1.1.1   VCA/Fdbk

Attack	Decay	Amount	Peak: 0
Bt: 14/Swing beat 100 bpm   Snd: A12/Boomy Kick

○ 4 ○ 47 ○ 4
ATTACK DECAY AMOUNT
A:99 D:99 S:99 R:99
120.0   1.1.1   Pitch Env

Sustain	Release	V
Bt: 14/Swing beat 100 bpm   Snd

○ 4 ○ 47 ○ 4
SUSTAIN RELEASE VEL AM
120.0

Shape	Rate	Amount	Destination
Bt: 14/Swing beat 100 bpm   Snd: A12/Boomy Kick

Triangle ○ 49/51 ○ C#2 OSC1 Freq
SHAPE RATE AMOUNT DESTINATION
120.0   1.1.1   LFO1

Shape	Rate
Bt: 14/Swing beat 100 bpm   Snd:

Triangle ○ 49/51
SHAPE RATE
120.0

Select Row	Source	Amount	Destination
Bt: 14/Swing beat 100 bpm   Snd: A12/Boomy Kick

Mod2: Pitch Envelope ▸ 0 ▸Osc1 Frequency
Mod3: Pitch Envelope ▸ 0 ▸Osc1 Frequency
Mod4: Pitch Envelope ▸ 0 ▸Osc1 Frequency
120.0   1.1.1   Mod Paths

Choke1	Choke2	Voice Assign
Bt: 14/Swing beat 100 bpm   Snd: A12/Boomy Kick

A03 B12 -
CHOKE PAD 1 CHOKE PAD 1 VOICE ASSIGN
120.0   1.1.1   Misc

Use the four arrow keys to move between the screens.

TEMPEST VOICE ARCHITECTURE
Modulation routing omitted for clarity

Diagram labels: L, R, PAN, AMP VOLUME, VCA, HPF, LPF, FEEDBACK LOOP, FEEDBACK LEVEL, SUB OSC LEVEL, OSC MIX, PRE-POST FILTER, OSC 3 LEVEL, OSC 4 LEVEL, SUB OSC, OSC 1, OSC 2, OSC 3, OSC 4
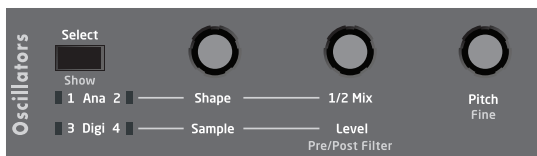
Oscillators

Tempest has four oscillators for each of its six voices. Oscillators 1 and 2 are digitally controlled analog oscillators or DCOs.

"Digitally controlled" does not mean the audio is digitally generated, just that the oscillators' frequencies are under digital—rather than voltage—control. The audio signal path is still completely analog. The advantage of digital control is that the tuning is exceptionally stable over a ten-octave range without having to compensate for variables like temperature.

Oscillators 3 and 4 are digital and generate various sample-based sounds, including different types of noise, samples of acoustic and electronic percussion, and single-cycle waves from the Prophet VS. The digital oscillators are converted to analog and pass through the same analog sound-shaping circuitry—filters, VCAs, etc.—as the analog oscillators.

The Oscillators section contains the most commonly used controls for Tempest's oscillators. However, there are additional parameters accessed via the display and its related controls. When the Oscillators screen is displayed, use the ▶ and ◀ keys to view all the available parameters and the ▼ and ▲ keys to switch between the different oscillators (and other edit screens).

The Analog Oscillators

Shape: Osc Off, Sawtooth, Triangle, Saw-Tri, Pulse 0% ... Pulse 99% — Selects the oscillator waveshape.
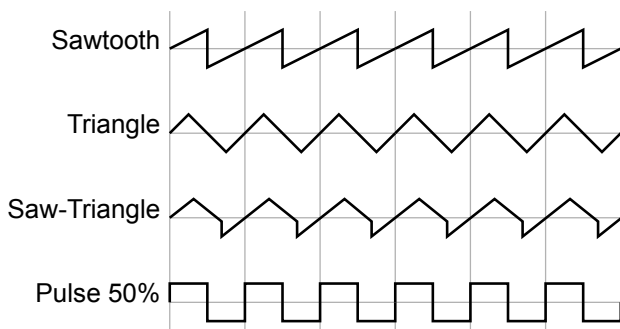
The Pulse values ranges from 0 to 99 per cent and set the pulse width or *duty cycle* of the Pulse wave. A value of 50 results in a true square wave with equal alternating high and low levels, as in the preceding illustration.

Increasing or decreasing the value from 50 causes the waveshape to become asymmetrical. Lower values narrow the positive-going portion of the wave, higher values widen it. At the extreme values, the pulse goes completely flat, which allows for some interesting possibilities with pulse width modulation.


0   50   99
Pulse Width
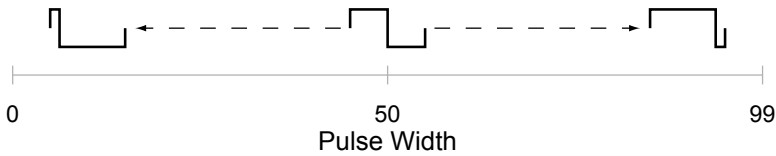
1/2 Mix: 100/0…0/100—Mixes the outputs of oscillators 1 and 2 in varying amounts. A setting of 100/0 is 100% oscillator 1 and 0% oscillator 2. A setting of 0/100 is just the opposite. A setting of 50/50 is an equal mix of both.

Pitch: 0…C 10—Sets the base oscillator frequency over a 10-octave range, from 8 Hz to 8 kHz, in semitones. C3 is middle C, the first octave is 0 (C0, C#0, etc.), the second octave is 1 (C1, C#1, etc.), and so on. Note that noise samples cannot be tuned.

Fine: -50…+50—Fine tune control with a range of a quarter tone up or down. Zero is centered. Steps are in cents (50 cents = ½ semitone).

Glide: 0...127—Sets the oscillator glide (portamento) rate. Glide is set independently for each oscillator. Low values are faster. See also Glide Mode.

Sync 2→1: Off, On—Turns oscillator hard sync on. With sync on, whenever oscillator 2 resets, oscillator 1 is forced to restart.
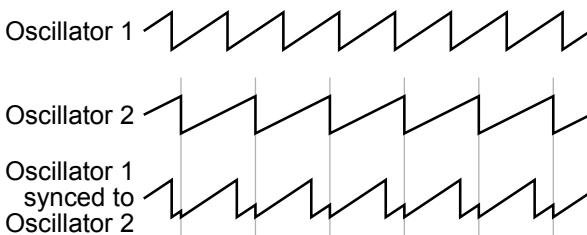
Sub Osc: 0...127—Controls the level of a square wave pitched one octave below oscillator 1.

Osc Slop: 0...5—The amount of random oscillator frequency tuning slop. The analog oscillators in Tempest are very accurate, and will not drift. This works great for accurate sounds, and allows precise de-tuning. Oscillator Slop allows subtle amounts of frequency drift. For larger amounts, use a random LFO.

Glide Mode: FixRate, FixRate A, FixTime, FixTime A—Determines how the oscillators respond when Gʟɪᴅᴇ is on.

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

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

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

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

Key Follow: Off, On—Turns keyboard tracking off or on for oscillator 1 or 2. When off, the oscillator plays at its base pitch and will not transpose when played from the pads or via MIDI.

Wave Reset: Off, On—When off, the oscillator is free-running and may be at any point in its cycle when the voice is gated on. Most analog synthesizers behave this way. The most noticeable effect is that the attack may vary slightly at very fast settings, adding a slight, variable click that can be desirable for some sounds. When Wᴀᴠᴇ Rᴇsᴇᴛ is on, the oscillator is restarted—reset to the zero crossing at the start of its cycle—every time a note is gated on.

The Digital Oscillators

Sample: Off, *sample name 1*, *sample name 2*, …—Tempest contains several hundred sampled sounds, including different types of noise, acoustic drums and percussion, classic analog and digital drum machines, effects, and the single-cycle waves from the Prophet VS. The sample format is 16-bit, 44.1kHz, mono. For a complete list of samples, see "Samples" on page 53.

Level: 0…127—Sets the volume level of oscillator 3 or 4.

Note: Volume level can be set, or affected by modulation, at several points in the signal path, so clipping distortion may occur if the levels and/or modulation amounts are set high. If clipping is undesirable, simply turn the level and/or mod amount down until it stops clipping.

Also, if Level is set to 0, the oscillator is effectively off; modulation applied to the oscillator level will have no effect.

Pitch: -24…+24—Offsets the base oscillator pitch as much as two octaves up or down in semitone increments. A setting of 0 indicates there is no offset and the oscillator plays at its base pitch.

Note: A few of the sounds—for example, some of the noise types—are of a fixed pitch and do not transpose, either from the Pitch control, the pads, or via MIDI.

Fine: -50…+50—Fine tune control with a range of a quartertone up or down. Zero is centered. Steps are in cents (50 cents = ½ semitone). Fine settings are also reflected in the Pitch value. For example, if Pitch is set to 0, but Fine is set to -50, the displayed Pitch value is -0.50 (-50 cents).

Glide: 0...127—Sets the oscillator glide (portamento) rate. Glide is set independently for each oscillator. Low values are faster. See also "Glide Mode," below.

Pre/Post Filter: 0...127—Oscillators 3 and 4 can be processed by Tempest's low- and high-pass filters, completely bypass the filters, or be set to a mix of the two. A value of 0 means all of the output from oscillators 3 and 4 goes through the filters, 64 is an equal mix of filtered and unfiltered signal, and 127 bypasses the filters entirely.

Note: Pre/Post Filter affects both oscillators 3 and 4, not just the currently selected oscillator.

Glide Mode: FixRate, FixRate A, FixTime, FixTime A—Determines how the oscillators respond when Glide is on.

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

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

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

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

Key Follow: Off, On—Turns keyboard tracking off or on for oscillator 3 or 4.

Lowpass

Frequency: 0...164—Sets the filter cutoff frequency over a range of more than 13 octaves. This control steps in semitones when turned slowly, but smoothly controls the filter without steps when turned at a faster rate.

4 Pole: On, Off—Selects the filter configuration. When on, the filter is in 4-pole mode. A 4-pole, low-pass filter rolls off frequencies above the cutoff frequency at a slope of -24dB/octave. When off, the filter is in 2-pole mode and has a slope of -12dB/octave and a more gradual roll-off of the higher frequencies.

Resonance: 0...127—Emphasizes a narrow band of frequencies around the cutoff frequency. In 4-pole mode, high levels of resonance can cause the filter to self oscillate. In 2-pole mode, resonance is much more subtle.

Audio Mod: 0...127—Controls the amount of audio from oscillator 1 used to modulate the filter cutoff frequency. For filter-only audio, set 1/2 Mix in the Oscillators section to 0/100, 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.

Key > Freq: 0...127—Sets the amount of modulation from the note number—from either the beat, the pads, or via MIDI—to the filter frequency. Sometimes called key tracking in keyboard synths, because the cutoff frequency "tracks" notes played on the keyboard. A setting of 64 will step the filter in semitone increments for each successive note, 32 is quartertones, and so on.

Highpass

Frequency: 0...127—Sets the filter cutoff frequency for the
2-pole high-pass filter. A setting of 0 passes all frequencies.
Turning the control up attenuates frequencies below the cutoff
at a slope of -12dB/octave.

Key > Freq: 0...127—Sets the amount of modulation from the note number—
from either the beat, the pads, or via MIDI—to the filter cutoff frequency.
Sometimes called key tracking in keyboard synths, because the cutoff frequency
"tracks" notes played on the keyboard.

Amp

Feedback: 0…127—The left audio output of each voice can feed back into the signal path pre-filter. Depending upon the amount of feedback, this can result in anything from a pleasing fuzzy distortion-like sound to unpredictable harmonic squealing and widespread pandemonium. A setting of 0 prevents any of the signal from feeding back. See "Tempest Voice Architecture" on page 17 for more information.

Note: Because the feedback loop is taken from the left output, pan settings and modulation will affect the behavior and level of feedback, so be careful (and maybe turn down your monitors/headphones while tweaking?)!

Volume: 0…127—Sets the volume of the current sound before it is sent to the mixer.

Note: Volume level can be set, or affected by modulation, at several points in the signal path, so clipping distortion may occur if the levels and/or modulation amounts are set high. If clipping is undesirable, simply turn the level and/or mod amount down until it stops clipping.

Envelopes

Tempest has five six-stage DAPDSR (delay/attack/peak hold/decay/sustain/release) envelope generators for each of its six voices. Two of the envelopes are "hard wired" to specific destinations: low-pass filter and amplifier (VCA). The PITCH envelope uses All Oscillators as a default destination, but it can be changed. The two auxiliary envelopes are assignable to any modulation destination. (For a complete list, see "Modulation Destinations" on page 52.) Additionally, any of the envelopes can modulate any destination using the modulation paths. (See "Modulation Paths" on page 29.)

The envelopes can also be switched to a two-stage APD (attack/peak hold/decay) type suited to percussive sounds simply by turning AD Mode on.

Envelope Generators: Pitch, Lowpass, Amp, Aux1, Aux2—Choose one of the five envelope generators to edit.

AD Mode: Off, On—Percussive sounds typically have a fast attack and then decay to silence with no sustain. When AD Mode is on, only the attack and decay portions of the envelopes are used, hence "AD." AD Mode affects all five envelopes.

AD Mode is effectively the same as setting Sustain to 0 and Release to the same value as Decay, so the same effect can be achieved when AD Mode is off.

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

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

Peak: 0…127—Peak is short for peak hold. Normally, the decay stage of the envelope begins immediately after the attack stage reaches its ultimate value. Peak briefly holds the envelope at its peak value, delaying the transition from attack to decay. This can add extra punch to a Sound's attack.

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

Sustain: 0...127—Sets the sustain time of the selected envelope. In AD Mode,

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Sᴜsᴛᴀɪɴ has no effect.

Release: 0...127—Sets the release time of the selected envelope. In AD Mode, Rᴇʟᴇᴀsᴇ has no effect.

Amount: -127...127—Sets the amount of modulation from the selected envelope to its destination. Use Amount (and not Velocity Amount) if you don't want the Sound to use the velocity sensitivity of Tempest's drum pads. The modulation amount can be positive or negative, allowing for inverted envelope control. The Amp envelope is an exception, with a range of only positive values (0-127), since VCA gain can't be negative!

Velocity Amount: 0...127—For most Sounds, the velocity with which the pads (or an external MIDI controller) are struck should be used to modulate the envelope amount. For example, Vᴇʟᴏᴄɪᴛʏ Aᴍᴏᴜɴᴛ (and not Aᴍᴏᴜɴᴛ) routed to the Aᴍᴘ envelope will use the drum pads' velocity sensitivity to control the volume of the Sound.

Aᴍᴏᴜɴᴛ and Vᴇʟᴏᴄɪᴛʏ Aᴍᴏᴜɴᴛ work in combination. If Aᴍᴏᴜɴᴛ is set to 127, Vᴇʟᴏᴄɪᴛʏ Aᴍᴏᴜɴᴛ will not have any effect regardless of the setting or the velocity with which the pad is struck because the modulation amount is already maxed out.

When using Vᴇʟᴏᴄɪᴛʏ Aᴍᴏᴜɴᴛ to control the envelope amount of velocity-sensitive sounds, Aᴍᴏᴜɴᴛ can be used to set the minimum peak level of the envelope when note velocity is 1 or close to it. For example, let's say you wish to create a drum sound in which the softest-played notes produce a volume ¼ that of the loudest notes, but when using Vᴇʟᴏᴄɪᴛʏ Aᴍᴏᴜɴᴛ alone, the softly-played notes are nearly silent. In this case, you would set the Aᴍᴘ envelope's Vᴇʟᴏᴄ-ɪᴛʏ Aᴍᴏᴜɴᴛ to 127 and its Aᴍᴏᴜɴᴛ to around 32. For this reason, when creating touch-sensitive sounds, you might think of the Aᴍᴏᴜɴᴛ parameter as "Minimum Envelope Amount."

Note: Velocity is ignored when 16 Lᴇᴠᴇʟs in Pad Function or Fɪxᴇᴅ Lᴇᴠᴇʟ in Pad Options is on. See "16 Levels" on page 9 and "Pad Options" on page 10 for more information.

Destination: Off, *mod destination 1*, *mod destination 2*, …—Envelopes Pɪᴛᴄʜ, Aᴜx1, and Aᴜx2 are assignable to any of Tempest's modulation destinations. For a complete list, see "Modulation Destinations" on page 52.

A Note About Envelope Shape

Like most synthesizers, Tempest's envelopes are not linear, but curved. Without going into too much detail (or math), the curve is based on a logarithmic function. But that curve—and, therefore, the envelope's shape—can be altered with modulation.

For example, figure A below shows the "normal" decay of a simple AD envelope where attack is set to 0.

A   **B**   **C**

Using one of Tempest's Mod Paths (see page 29), an envelope can be used to modulate itself. Figure B shows what happens when the envelope in figure A is used as the modulation source and the mod destination is that same envelope's decay, with a mod amount of -60; figure C is with a mod amount of 60.

Note: Modulating an envelope segment also changes its length (time). In the previous examples, figure B's decay time was decreased and figure C's decay time was increased.

LFO 1 & 2

Tempest has two low frequency oscillators (LFOs). The LFOs can be free-running or synced to the beat.

LFO2: Off, On—Chooses the LFO to edit. When off, the panel controls affect LFO 1; when on, LFO 2.

Rate: 0...162—Sets the LFO frequency. Speed ranges from slow (30 seconds) to very fast—at 90 (8 HZ, C-2) and above the speed steps in semitones, up to 162 (523 Hz, C4 or an octave above middle C).

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

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

Shape: Triangle, Reverse Sawtooth, Sawtooth, Square, Random—The wave-shape of the LFO. Random (or "sample and hold") generates a random value that changes once per cycle.

Destination: Off, mod destination 1, mod destination 2, …—Sets the modulation destination to which the LFO is routed. See "Modulation Destinations" on page 52 for a list of possible destinations.

Sync: Off, On—When on, the LFO syncs to the beat based on multiples of quarter notes, regardless of the time signature. RATE displays the values in the following table.

Display	Cycles per Quarter Note(s)
32 Qrtr	One LFO cycle lasts 32 quarter notes
16 Qrtr	One LFO cycle lasts 16 quarter notes
8 Qrtr	One LFO cycle lasts 8 quarter notes
6 Qrtr	One LFO cycle lasts 6 quarter notes
4 Qrtr	One LFO cycle lasts 4 quarter notes
3 Qrtr	One LFO cycle lasts 3 quarter notes
1/2 Note	One LFO cycle lasts 2 quarter notes
Qrtr Dot	One LFO cycle lasts 1.5 quarter notes
1 Qrtr	One LFO cycle lasts 1 quarter note
Qrtr Trip	Two LFO cycles every three quarter notes
8th	Two LFO cycles per quarter note
8th Trip	Three LFO cycles per quarter note
1/16	Four LFO cycles per quarter note
16th Trip	Six LFO cycles per quarter note
32nd	Eight LFO cycles per quarter note
64th	Sixteen LFO cycles per quarter note

Tip: Use SYNC to modulate a parameter in time with a beat. For example, for a beat in 4/4, an LFO set to a triangle wave and a rate of 16 Qrtr can modulate the filter frequency for a sweep that repeats every 4 bars, precisely.

Modulation Paths

Tempest has eight general-purpose modulation paths with a great variety of mod sources and destinations available. Press MOD PATH to display the settings for the current sound.

Source: Off, mod source 1, mod source 2, …—Sets the modulation source for the selected mod path. See "Modulation Sources" on page 51 for a complete list.

Tip: Use SOURCE to route external MIDI controllers to Tempest's mod destinations.

Amount: -127…127—Sets the amount of the source used to modulate the destination. The modulation amount can be positive or negative, allowing for inverted control.

Destination: Off, mod source 1, mod source 2, …—Sets the modulation destination for the selected mod path. See "Modulation Destinations" on page 52 for a complete list.

Choke and Voice Assign

Each of a Beat's thirty-two Sounds can be choked by one of two other Sounds in the Beat. The most obvious use is to enable a pedaled or closed hihat to choke off an open hihat.

To Set Choke for a Sound:

1. In 16 SOUNDS pad mode and SOUNDS edit mode, use the PAGE DOWN or ▼ key to navigate to the Misc screen.

2. Tap any pad to select a Sound.

3. Use the CHOKE 1 Soft Knob to choose the Sound/pad that will choke the selected Sound. If desired, use CHOKE 2 to specify a second choke Sound/pad.

VOICE ASSIGN restricts a Sound to playing on only one of Tempest's six voices. By default, Tempest uses dynamic voice allocation. That is, if a voice is already occupied with playing a Sound, new notes will play on the next available voice. When all six voices are in use, new notes will steal a voice from one of the Sounds already playing, causing that Sound to be cut off. Assigning a Sound to a specific voice guarantees that voice won't be stolen, at least not by the remaining dynamically allocated voices. Multiple Sounds can be assigned to a single voice and will still steal the voice when two or more notes play simultaneously.

Again, using a hihat as an example, assigning the different hihat articulations to a single voice will guarantee that the hihat will always sound and its voice will not be stolen. If a Beat has a steady 8th- or 16th-note pattern, it will be pretty obvious if the hihat's voice is stolen, even for one note.

Be aware, though, that some Sounds—particularly Sounds with longer decays like crash or ride cymbals—can benefit from the voices being dynamically allocated. These Sounds tend to sound better or, at least, more realistic, if they're allowed to overlap and not be cut off by voice stealing, so it may take some planning and tweaking to achieve a good balance between Sounds assigned to specific voices and Sounds that use the remaining pool of dynamically allocated voices.

VOICE ASSIGN also assigns a Sound to a specific voice output. For example, if the kick drum is assigned to voice 1, the kick drum will be available for separate processing via the Voice 1 jack on the rear panel. Inserting a plug in one of the individual voice output jacks removes that voice from the main outputs. The voice output jacks are stereo, and so retain any pan settings.

To Assign a Sound to a Specific Voice:

1. In 16 SOUNDS pad mode and SOUNDS edit mode, use the PAGE DOWN or ▼ key to navigate to the Misc screen.

2. Tap any pad to select a Sound.

3. Use the VOICE ASSIGN Soft Knob to choose one of the six voices.

Beat-wide Parameters

Normally the panel sound controls operate on a single sound. However, if Pad Function is set to 16 BEATS, only eight of these controls are enabled and they affect the playback of all sounds playing in the beat. These eight parameters are called *Beat-wide parameters*:
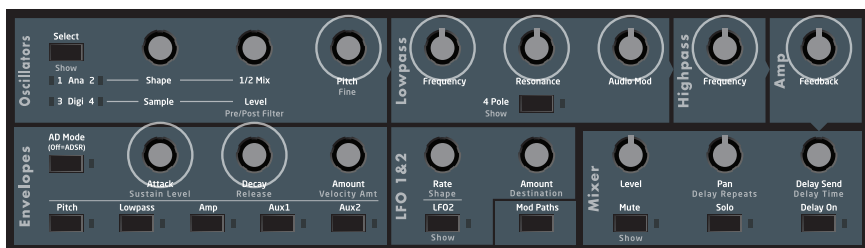
The eight parameters are Oscillator Pitch, Lowpass Frequency, Lowpass Resonance, Audio Mod, Highpass Frequency, VCA Feedback, Envelope Attack and Envelope Decay. For each of these eight parameters, moving the knob causes the playback of all sounds to be altered simultaneously. Because the parameter values can be very different for different sounds, the individual parameters are moved proportionally in a way that results in the overall change sounding very natural.

If the SOUNDS key (in the Screens section) is pressed, one of the following two screens is displayed:
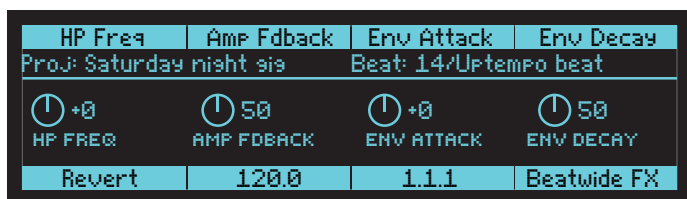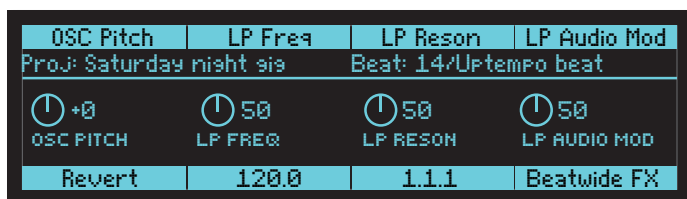
Notice the REVERT Soft Key. After any of the Beat-wide parameters is changed, this soft key appears. Pressing it reverts the beat playback to its original state before any controls were changed.

Mixer and Effects

A 32-input mixer permits unique mix (volume, mute, solo, pan, delay send, and delay on/off for each sound) and effects settings (delay time, delay feedback, distortion, compression) for each Beat.

The Delay feature acts like a digital audio delay but instead creates additional delayed notes in order to keep Tempest's entire signal in the analog domain.

You can change the mixer settings by adjusting the controls in the Mixer section of the panel, or by selecting MIXER in the Screens section (pressing PADS and SOUNDS together), which causes the Mixer screen to appear.
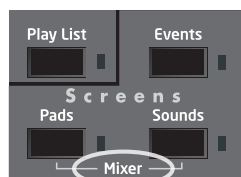
Use the PAGE UP and PAGE DOWN keys to switch between the four mixer screens below:

This screen adjusts VOLUME, PAN, MUTE, and SOLO for each sound pad.
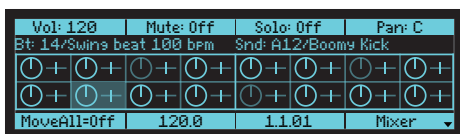
This screen adjusts DELAY SEND and DELAY ON/OFF for each sound pad. Note that sounds must be velocity-sensitive for the delayed notes to have volumes other than full.
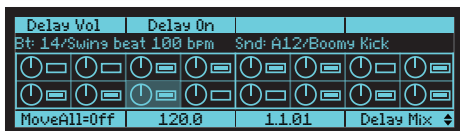
This screen adjusts DELAY TIME and DELAY FEEDBACK for the delay send mix.

This screen shows the Beat's settings for the panel's DISTORT and COMPRESS controls.

Real Time FX

The Real Time FX touch sliders have two modes:

1. Beat FX: The sliders can alter the sound of the entire Beat playback.

2. Note FX: The sliders can alter parameters of a single Sound, and those changes can be recorded into the Beat.

Beat FX

If Pad Function is set to 16 Beats, Beat FX mode is active, in which slider movements affect Beat-wide sound parameters, altering the sound of the entire Beat's playback. In this mode, the Playback key is always on.
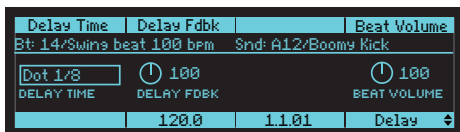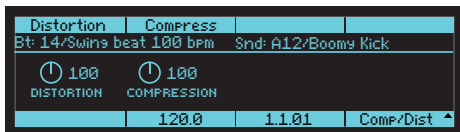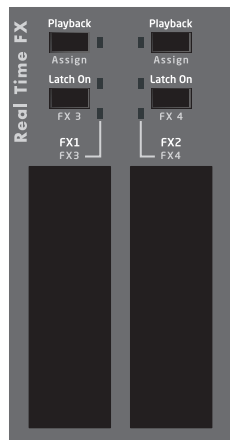
Try it out. Select the 16 Beats key, press a beat pad and press Play. Now press either of the sliders and move your finger up and down. Hear how your finger movements alter the sound of the Beat. Now hold Shift and press the left Latch On key, then move your finger on the left slider as the Beat plays. Notice that you hear a different sound change, because you've just selected the alternate FX3 function for the left slider.

Here's what the keys do:

Playback key
The Playback key is always on.

Shift + Playback: Assign
This displays the Beat FX Assign screen, permitting the viewing or editing of the Beat FX assignments.

The Latch On key
Normally the sliders are active only when you touch them. If the Latch On key is on, the sliders remain active at their last touched positions at all times.

Shift + Latch On: FX1/FX3 or FX2/FX4 Select
Pressing Shift + the left Latch On key toggles the left slider between its FX1 and FX3 functions. Pressing Shift + the right Latch On key toggles the right slider between its FX2 and FX4 functions.

To view or edit the Beat FX assignments, press SHIFT + either PLAYBACK key:

Soft Knob 1: Select Row
Select one of the rows for editing: rows 1-4 for slider FX1-4 Position, and rows 5-8 for slider FX1-4 Pressure.

"Pos" indicates positive modulation, meaning that moving the slider upwards modulates the destination in a positive direction. This cannot be changed.

```
Edit Beat FX1    Source                    Destination
Proj: Saturday night gig      Beat: 14/Uptempo beat
Beat FX1: Slider1 Pos +/-  ▶  Pos  ▶   BW All Osc Freq
Beat FX2: Slider2 Pos +/-  ▶  Pos  ▶   BW Lowpass Freq
Beat FX3: Slider3 Pos +/-  ▶  Pos  ▶   BW All Env Dec
Beat FX4: Slider4 Pos +/-  ▶  Pos  ▶   BW Highpass Freq
                 120.0           1. 1. 1      Beat FX
```

Soft Knob 2: Source
For rows 1-4, the position data from any of the sliders FX1-4 may be selected, as "+" (positive output only with 0 at bottom of slider) or "+/-" (bipolar output with 0 in middle of slider). For rows 5-8, the pressure data from any of the sliders FX1-4 may be selected.

Soft Knob 4: Destination
Options are all Beat-wide sound parameters: Oscillator Pitch, Lowpass Frequency, Lowpass Resonance, Audio Mod, Highpass Frequency, VCA Feedback, Envelope Attack and Envelope Decay.

Beat FX slider movements are for live performance only and cannot be recorded. However, Note FX (described in the following section) does permit recording of slider movements, and Note FX sliders may be assigned to Beat-wide sound parameters.

Note FX

If Pad Function is not set to 16 BEATS, Note FX mode is active, in which slider movements affect the sound of a single sound pad, altering one of its sound parameters. Unlike Beat FX, these movements can be recorded into the Beat.

Try it out. Select the 16 SOUNDS key, then press a sound pad repeatedly while moving your finger on one of the sliders. Notice that the sound changes as you move the slider. (If nothing happens, try another sound pad because the one you selected may have no Note FX assignment.) Now hold SHIFT and press the left LATCH ON key, then move your finger on the left slider as the Beat plays. Notice that you hear a different sound change, because you've just selected the alternate FX3 function for the left slider. If you move the sliders while recording a sound pad into a Beat, the value of the slider at the moment the pad is played will be recorded into the new note, and these parameter changes will be heard when the Beat plays back.
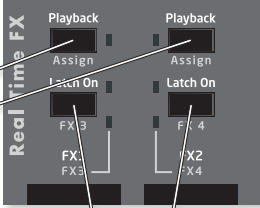
Here's what the panel keys do:

Playback key
The Playback key is always on.

Shift + Playback: Assign
This displays the Beat FX Assign screen, permitting the viewing or editing of the Note FX assignments.

Playback   Playback
Assign   Assign
Latch On   Latch On
FX 3   FX 4
FX1   FX2
FX3   FX4

Real Time FX

The Latch On key
Normally the sliders are active only when you touch them. If the Latch On key is on, the sliders remain active at their last touched positions at all times.

Shift + Latch On: FX1/FX3 or FX2/FX4 Select
Pressing Shift + the left Latch On key toggles the left slider between its FX1 and FX3 functions. Pressing Shift + the right Latch On key toggles the right slider between its FX2 and FX4 functions.

To view or edit the Note FX assignments, select Note FX Assign by holding SHIFT while pressing either PLAYBACK key:

Soft Knob 1: Select Row
Select one of the 4 Note FX channels (within each note event) for editing.

Soft Knob 3: Amount
Select the amount of effect the slider movement has on the destination parameter.

Beat & Sound
Each of the beat's 32 sounds has a unique set of 4 Note FX assignments. Those displayed apply only to the selected sound.

Select Row	Source	Amount	Destination

Bt: 14/Swing beat 100 bpm   Snd: A12/Boomy Kick
Note FX1: Slider1 Pos +/-   ▶ +64 ▶ Osc Pitch
Note FX2: Slider2 Pos +/-   ▶ +25 ▶ LP Freq
Note FX3: Slider3 Pos +   ▶ +43 ▶ LP Reson
Note FX4: Slider4 Pos +/-   ▶ +51 ▶ Env Decay
                  120.0   1.1.1   Note FX

Soft Knob 2: Source
This selects the input for the selected Note FX channel (1-4) within each note. Options are Slider FX1-4 Position (either positive or bipolar) or Slider FX1-4 Pressure.

Soft Knob 4: Destination
This selects the destination for the Note FX channel within each note. A variety of voice modulation destinations are available.

Rec/Edit Keys

These four keys provide a variety of functions for editing Sounds, Beats, Play Lists, and Projects.
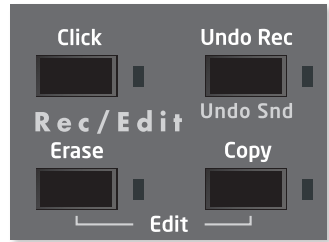
The Click key

Pressing this toggles the click (metronome) on or off.

The Undo Rec key

If the Undo Rec light is on, this means there is something to undo. Pressing Undo Rec will undo all recording changes made during the last recording pass (since the moment you started the Beat playing with Rec on) and will turn off the light. This is a single-level undo.

Holding Shift while pressing Undo Rec invokes the Undo Sound command. This will undo the last edit you made to a sound. This is a single-level undo.

The Erase key

To Quickly Erase All Notes from a Beat:

1. Press 16 Beats.

2. While holding Erase, press the beat pad to be erased.

To Quickly Erase All Notes of a Single Sound Pad from a Beat:

1. Press 16 Sounds.

2. While holding Erase, press the sound pad to be erased.

To Quickly Erase only Some Notes from a Beat:

1. Press 16 Sounds.

2. Turn Record on and press Play.

3. Hold both Shift and Erase, then during the time that the notes to be erased are playing, also hold the sound pad for those notes.

The Copy key

To Quickly Copy One Beat over Another Beat Pad, Replacing its Contents:

1. Press 16 Beats.

2. While holding Copy, press the Beat pad to be copied from, then the Beat pad to be copied to.

To Quickly Copy One Sound to another Sound Pad, Replacing its Contents:

1. Press 16 Sounds.

2. While holding Copy, press the Sound pad to be copied from, then the Sound pad to be copied to.

The Edit function

Pressing Erase and Copy together presents a menu of edit functions:

Copy Sound	**Initialize Sound**	**Rename Sound**
Copy Beat	**Initialize Beat**	**Rename Beat**
Copy Bars	**Insert bars**	**Delete bars**
Rename Project	**Initialize Project**	

Turn Soft Knob 1 to select one of the edit functions, then press the Soft Key to select it. Each screen contains up to four fields that are edited using the 4 soft knobs. Once the fields are set correctly, pressing the Soft Key performs the editing function.

Save/Load

Pressing SAVE/LOAD presents a menu of functions related to saving or loading files. Like a personal computer, Tempest has both random access memory (RAM) and permanent non-volatile storage for saved Sounds, Beats, and Projects. The current Sound, Beat, or Project is always loaded into RAM for playback and editing. Tempest uses flash memory for non-volatile storage.

It is important to understand the distinction between RAM and flash. As with most PC-based software applications, edits to files in RAM must be saved to flash to be recalled later. But, like most synthesizers, Tempest will not prompt you to save changes when powering down or loading another file. It would be pretty annoying if—in the middle of a frenetic, knob-twisting, performance—a prompt came up asking you to save changes every time you switched Beats or loaded a file! But, while you are making beats and sounds, it's good to get in the habit of saving your work often and, occasionally, backing your work up via MIDI.

Note: Beats include all Sounds used in them and Projects include Beats, which, in turn, include all Sounds in each of the Beats. See "Sounds, Beats, and Projects" on page 3 for a general explanation of the relationship between Sounds, Beats, and Projects.

Saving Sounds, Beats, and Projects

Sounds are saved to one of several folders in Tempest's flash memory. They can also be exported and saved as system exclusive MIDI data. (See "Exporting Sounds, Beats, and Projects" on page 42.)

To Save a Sound to Flash:

1. In 16 SOUNDS mode, tap a pad to choose the Sound to save.

2. Press SAVE/LOAD, choose Save Sound, and press the NEXT Soft Key.

3. The current source Beat and Sound are displayed and can be changed, if desired.

4. Select the destination Sound folder.

5. Enter the name using the EDIT FILENAME Soft Knob to choose characters and the ◀ and ▶ keys to move the cursor.

6. Press the SAVE NOW Soft Key.

7. Press the EXIT Soft Key or SAVE/LOAD to exit.

Beats are saved to one of several folders in Tempest's flash memory. They can also be exported and saved as system exclusive MIDI data. (See "Exporting Sounds, Beats, and Projects" on page 42.)

To Save a Beat to Flash:

1. In 16 BEATS mode, tap a pad to choose the Beat to save.

2. Press SAVE/LOAD, choose **Save Beat**, and press the Next Soft Key.

3. The current source Beat is displayed and can be changed, if desired.

4. Select the destination Beat folder.

5. Enter the name using the EDIT FILENAME Soft Knob to choose characters and the ◀ and ▶ keys to move the cursor.

6. Press the SAVE NOW Soft Key.

7. Press the EXIT Soft Key or SAVE/LOAD to exit.

Projects are saved to one of 10 Projects folders in Tempest's flash memory. They can also be exported and saved as system exclusive MIDI data. (See "Exporting Sounds, Beats, and Projects" on page 42.)

To Save a Project to Flash:

1. Press SAVE/LOAD, choose **Save Project**, and press the NEXT Soft Key.

2. Select the destination Projects folder.

3. Enter the name using the EDIT FILENAME Soft Knob to choose characters and the ◀ and ▶ keys to move the cursor.

4. Press the SAVE NOW Soft Key.

5. Press the EXIT Soft Key or SAVE/LOAD to exit.

Loading Sounds, Beats, and Projects

A Sound is loaded into RAM from flash and assigned to one of Tempest's pads. Sounds can also be imported via MIDI. (See "Importing Sounds, Beats, and Projects" on page 45.)

To Load a Sound:

1. In 16 Sounds mode, tap a pad to choose the destination Sound.

2. Press Save/Load, choose **Load File (Sound/Beat/Project)**, and press the Next Soft Key.

3. Choose the Type, Folder, and File, and press the Next Soft Key.

4. The selected destination Beat and Sound are displayed, but can be changed, if desired.

5. Press the Load Now Soft Key.

6. Press the Again Soft Key to load another file or Save/Load to exit.

The Sound is loaded into the destination pad. Any unsaved edits to the previous Sound will be lost. Press Save/Load again at any time prior to pressing Load Now to cancel the operation.

A Beat is loaded into RAM from flash and assigned to one of Tempest's pads. Beats can also be imported via MIDI. (See "Importing Sounds, Beats, and Projects" on page 45.)

To Load a Beat:

1. In 16 Beats mode, tap a pad to select the destination Beat.

2. Press Save/Load, choose **Load File (Sound/Beat/Project)**, and press the Next Soft Key.

3. Choose the Type, Folder, and File, and press the Next Soft Key.

4. The selected destination Beat is displayed, but can be changed, if desired.

5. Press the Load Now Soft Key.

6. Press the Again Soft Key to load another file or Save/Load to exit.

The Beat is loaded into the destination pad. Any unsaved edits to the previous

Beat will be lost. Press Save/Load again at any time prior to pressing Load Now to cancel the operation.

A Project is loaded from flash and replaces the current Project in RAM. (Only one Project can be loaded at a time.) The last Project saved is loaded by default on power up. Projects can also be imported via MIDI. (See "Importing Sounds, Beats, and Projects" on page 45.)

To Load a Project:

1. Press Save/Load, choose **Load File (Sound/Beat/Project)**, and press the Next Soft Key.

2. Choose the Folder and File, and press the Next Soft Key.

3. Press the Load Now Soft Key to load the Project.

4. Press the Again Soft Key to load another file or Save/Load to exit.

Loading a Project replaces all the Sounds and Beats in RAM with the Sounds and Beats in the Project. Press Save/Load again at any time prior to pressing Load Now to cancel the operation.

Exporting Sounds, Beats, and Projects

Sounds, Beats, and Projects can be exported over MIDI to a computer application or hardware device capable of recording SysEx data. Most modern MIDI sequencers are capable of recording SysEx and there are standalone applications like SysEx Librarian for Mac OS and MIDI-OX for Windows that make it very easy to record, name, and store SysEx files. SysEx data can also be dumped directly from one Tempest to another using a single MIDI cable.

Exporting directly from RAM or from saved files in flash memory yields slightly different results. Sounds, Beats, and Projects exported from RAM contain no information about their source or destination. If Sounds/Beats/Projects exported from RAM are later imported, they are loaded into RAM and must be saved to flash or they will be lost when power is cycled. Sounds/Beats/Projects exported from saved files will import into flash in the same folder location from which they were exported and do not need to be saved. But, they do need to be loaded into RAM if you want to play them.

To Export a Sound from RAM over MIDI:

1. Connect Tempest to the receiving device (computer running MIDI application, dedicated hardware sequencer, etc.) using either USB or a MIDI interface. If using a MIDI interface, connecting Tempest's MIDI out to the device's MIDI in is sufficient for exporting.

2. In 16 SOUNDS mode, tap a pad to choose the Sound to export.

3. Press SAVE/LOAD, choose **Export Sound in RAM over MIDI**, and press the NEXT Soft Key.

4. The current source Beat and Sound are displayed and can be changed, if desired.

5. Choose the destination (MIDI and/or USB).

6. Enable the receiving device to receive and record SysEx.

7. Press the EXPORT NOW Soft Key.

8. The device records the SysEx data, which can then be named and saved for backup and importing into Tempest.

9. Press the AGAIN Soft Key to export another file or SAVE/LOAD to exit.

To Export a Beat from RAM over MIDI:

1. Connect Tempest to the receiving device (computer running MIDI application, dedicated hardware sequencer, etc.) using either USB or a MIDI interface. If using a MIDI interface, connecting Tempest's MIDI out to the device's MIDI in is sufficient for exporting.

2. In 16 BEATS mode, tap a pad to choose the Beat to export.

3. Press SAVE/LOAD, choose **Export Beat in RAM over MIDI**, and press the NEXT Soft Key.

4. The current source Beat is displayed and can be changed, if desired.

5. Choose the destination (MIDI and/or USB).

6. Enable the receiving device to receive and record SysEx.

7. Press the EXPORT NOW Soft Key.

8. The device records the SysEx data, which can then be named and saved for backup and importing into Tempest.

9. Press the AGAIN Soft Key to export another file or SAVE/LOAD to exit.

To Export a Project from RAM over MIDI:

1. Connect Tempest to the receiving device (computer running MIDI application, dedicated hardware sequencer, etc.) using either USB or a MIDI interface. If using a MIDI interface, connecting Tempest's MIDI out to the device's MIDI in is sufficient for exporting.

2. In 16 BEATS mode, press SAVE/LOAD, choose **Export Project in RAM over MIDI**, and press the NEXT Soft Key.

3. Since there can only be one Project in RAM at a time, there is no source to choose. Choose the destination (MIDI and/or USB).

4. Enable the receiving device to receive and record SysEx.

5. Press the EXPORT NOW Soft Key.

6. The device records the SysEx data, which can then be named and saved for backup and importing into Tempest.

7. Press the AGAIN Soft Key to export another file or SAVE/LOAD to exit.

To Export a Sound/Beat/Project from Flash over MIDI:

1. Connect Tempest to the receiving device (computer running MIDI application, dedicated hardware sequencer, etc.) using either USB or a MIDI interface. If using a MIDI interface, connecting Tempest's MIDI out to the device's MIDI in is sufficient for exporting.

2. Press SAVE/LOAD, choose **Export saved file over MIDI (Sound/Beat/ Project)**, and press the NEXT Soft Key.

3. Choose the Type, Folder, and File to export.

4. Choose the destination (MIDI and/or USB).

5. Enable the receiving device to receive and record SysEx.

6. Press the EXPORT NOW Soft Key.

7. The device records the SysEx data, which can then be named and saved for backup and importing into Tempest.

8. Press the AGAIN Soft Key to export another file or SAVE/LOAD to exit.

To Export from one Tempest (master) to Another (slave) over MIDI:

1. Connect MIDI out on the master to MIDI in on the slave. (Tempest is incapable of acting as a USB host, so transfers must be done using a MIDI cable.)

• If exporting a Sound from RAM, put both Tempests into 16 Sounds mode, tap a pad on the master to select the source Sound, and tap a pad on the slave to choose the destination.

• If exporting a Beat from RAM, put both Tempests into 16 Beats mode, tap a pad on the master to select the source Beat, and tap a pad on the slave to choose the destination.

• If exporting a Project from RAM, put both Tempests into 16 Beats mode. Since there is only one Project in RAM at a time, there is no source or destination to select.

2. On the master, press Save/Load and choose **Export Sound/Beat/Project in RAM over MIDI** or **Export Saved File over MIDI (Sound/Beat/Project)** to transfer the data. The slave does not need to be enabled to receive the transfer. Just press Export Now when ready. Exports from RAM load into the slave's RAM; exports from flash load into the slave's flash.

3. Press the Again Soft Key to export another file or Save/Load to exit.

Importing Sounds, Beats, and Projects

Importing data from SysEx files is simple. Connect the transmitting device to Tempest via USB or MIDI—one MIDI cable from the device's MIDI out to Tempest's MIDI in—and then open and play the files from a MIDI sequencer or SysEx utility. Files exported from RAM load into the current Sound/Beat/Project in RAM; files exported from flash load into flash in the same location from which they were originally exported. The display will give you the status of the process and let you know when the file has successfully been saved.

Keep in mind that importing data exported from RAM replaces the current Sound, Beat, or Project in RAM. If edits to the current Sound/Beat/Project have not been saved to flash or exported, they will be lost.

Files imported into RAM need to be saved to flash or they will be lost when the power is cycled.

Files imported into flash need to be loaded into RAM in order to play or edit them.

Important Import Notes

Importing a Sound/Beat/Project to flash with the same name as one already in flash will overwrite the file, so always back up your work before importing a file if you are not absolutely certain of the imported file's contents.

Due to the time it takes for Tempest to save a Sound/Beat/Project to flash, you must have a minimum one-second pause between SysEx files transmitted to the unit. Otherwise you will get errors from the flash system. SysEx Librarian and MIDI-OX can both be configured to add a pause or delay when sending multiple SysEx files.

SysEx files for Projects can be large and take twenty seconds or more to load. Press the CANCEL Soft Key if you wish to stop a SysEx import.

Renaming Files

Any of the files saved to Tempest can be renamed.

To Rename a File:

1. Press SAVE/LOAD, choose **Rename File (Sound/Beat/Project)** and press the NEXT Soft Key.

2. Choose the Type, Folder, and File to rename and press NEXT.

3. Use SELECT CHAR (Soft Knob 3) and EDIT CHAR (Soft Knob 4) to select and edit characters, respectively. Use INSERT CHAR (PAGE UP key) to insert space before the selected character. Use DELETE CHAR (▲ key) to delete the selected character.

4. When the name is complete, press RENAME NOW.

5. Press AGAIN to rename another file or SAVE/LOAD to exit.

Deleting Files

Any of the files saved to Tempest can be deleted.

To Delete a File:

1. Press SAVE/LOAD, choose **Delete File (Sound/Beat/Project)** and press the NEXT Soft Key.

2. Choose the Type, Folder, and File to delete and press NEXT.

3. Press DELETE NOW to delete the file

4. Press AGAIN to rename another file or SAVE/LOAD to exit.

Note: Deleted files cannot be recovered. To cancel a delete operation, press SAVE/LOAD again prior to step 3.

System Settings

Press SYSTEM to view the System menu. The System menu contains various global parameters that apply to all operation regardless of the selected Beat or Sound. Any changes to these settings are remembered even after power is turned off.

Click Level: 1...127—Sets the volume of the metronome click.

One bar count in: Off, On, Record Only—When On, one bar of metronome clicks plays before recording or playback begins. If set to Record Only, the count in only plays before recording. If Off, no count in plays.

Note: Count in does not play when syncing to an external MIDI clock.

Fixed Level Velocity: 2...128—Sets the velocity value used when FIXED LEVEL in Pad Options is on.

Pedal 1/2 Mode: Controller, Switch +, Switch -

Pedal 1/2 Assignment: See table—Tempest's two Pedal/Switch inputs can be configured to work with either momentary footswitches or expression pedals to control various functions.

Use Pedal Mode to choose the input device: Controller for an expression pedal, Switch + for a normally open footswitch, and Switch – for a normally closed footswitch.

The table below lists the Pedal Assignment options and the input devices with which they are typically used.

Expression Pedal	Footswitch
Mod Source Pedal 1/2	Sequencer Start/Stop
Master Volume	Sequencer Start
Note FX 1	Sequencer Stop
Note FX 2	Record Arm On/Off
Note FX 3	Roll On/Off
Note FX 4	Reverse On/Off

Mod Source Pedal 1 or 2 routes an expression pedal directly to the Foot Pedal 1 or 2 modulation source. (See "Modulation Paths" on page 29 for more infor-

mation.) Master Volume routes an expression pedal directly to master volume. The Note FX options allow an expression pedal to be used in addition to, or as an alternative to, the Real Time FX sliders. (See "Real Time FX" on page 34 for more information.)

MIDI: Clock Mode: Auto, Master, Slave, Off—In Auto mode, Tempest senses whether or not MIDI clock is being received. If it is, Tempest syncs to MIDI clock; if it is not, Tempest uses its internal clock. In Master mode, Tempest transmits MIDI clock and start, stop, and continue messages. In Slave mode, Tempest syncs to MIDI clock and responds to start, stop, and continue messages. If no MIDI clock is present at the selected input, Tempest will not play. When clock mode is set to Off, MIDI clock is neither transmitted nor received.

BPM Source: Project, Beat—Each Beat has its own unique tempo setting (in beats per minute or BPM) but there is also a single tempo setting for the Project. If you wish to use the Beat's tempo setting (and have the tempo change when a different Beat is selected), set this to Beat (factory default). If you wish to use the Project's tempo setting (so that the tempo stays the same regardless of which Beat is playing), select Project. Saving a Beat with BPM Source set to Beat saves the Beat with the current BPM. Saving a Project with BPM Source set to Project saves the Project with the current BPM.

Swing Source: Project, Beat—Each Beat has its own unique swing setting (50% to 75%) but there is also a single swing setting for the Project. If you wish to use the Beat's setting (and have the swing amount change when a different Beat is selected), set this to Beat (factory default). If you wish to use the Project's swing setting (so that the swing amount stays the same regardless of which Beat is playing), choose Project. Saving a Beat with Swing Source set to Beat saves the Beat with the current swing setting. Saving a Project with Swing Source set to Project saves the Project with the current swing setting.

Compression Source: Project, Beat, Pot Position—Each Beat has its own unique compression setting but there is also a single compression setting for the Project. If you wish to use the Beat's setting (and have the compression amount change when a different Beat is selected), set this to Beat (factory default). If you wish to use the Project's swing setting (so that the compression amount stays the same regardless of which Beat is playing), choose Project. If you wish the Compression setting to always reflect the position of the Compression knob, choose Pot Position. Saving a Beat with Compression Source set to Beat saves the Beat with the current compression setting. Saving a Project with Compression Source set to Project saves the Project with the current compression setting.

Distortion Source: Project, Beat, Pot Position—Each Beat has its own unique distortion setting but there is also a single distortion setting for the Project. If you wish to use the Beat's setting (and have the distortion amount change when a different Beat is selected), set this to Beat (factory default). If you wish to use the Project's distortion setting (so that the distortion amount stays the same regardless of which Beat is playing), choose Project. If you wish the distortion setting to always reflect the position of the Distortion knob, choose Pot Position. Saving a Beat with Distortion Source set to Beat saves the Beat with the current distortion setting. Saving a Project with Distortion Source set to Project saves the Project with the current distortion setting.

Calibrate Analog Oscillators and Filters: Tempest's analog waveshapes and filters are calibrated at the factory and should not need to be recalibrated unless you are experiencing problems.

Calibrate Slider 1 and 2 Position: Tempest's Sliders are calibrated at the factory and should not need to be recalibrated unless you are experiencing problems.

Reset System Parameters: Resets all the system parameters to their default values.

Show System Information: Displays the current versions of the operating systems.

Modulation Sources

Pitch Envelope

Filter Envelope

Amp Envelope

Aux 1 Envelope

Aux 2 Envelope

LFO 1

LFO 2

Velocity

Note Number

Noise

Random

Pad Pressure

Slider Position 1

Slider Position 2

Slider Pressure 1

Slider Pressure 2

Foot Pedal 1

Foot Pedal 2

MIDI Pitch Bend

MIDI Mod Wheel

MIDI Breath

MIDI Expression

Modulation Destinations

Osc 1 Frequency	All Env Amount
Osc 2 Frequency	Pitch Env Attack
Osc 3 Frequency	Filter Env Attack
Osc 4 Frequency	Amp Env Attack
Osc All Freq	Aux 1 Env Attack
Osc 1/2 Mix	Aux 2 Env Attack
Osc 3 Level	All Env Attack
Osc 4 Level	Pitch Env Decay
Osc 1 Pulsewidth	Filter Env Decay
Osc 2 Pulsewidth	Amp Env Decay
Osc 1/2 Pulsewidth	Aux 1 Env Decay
Sub Osc Volume	Aux 2 Env Decay
Feedback Volume	All Env Decay
Lowpass Filter	Pitch Env Release
Resonance	Filter Env Release
Filter FM	Amp Env Release
Highpass Filter	Aux 1 Env Release
VCA	Aux 2 Env Release
Pan	All Env Release
LFO 1 Frequency	Mod 1 Amount
LFO 2 Frequency	Mod 2 Amount
LFO All Freq	Mod 3 Amount
LFO 1 Amount	Mod 4 Amount
LFO 2 Amount	Mod 5 Amount
LFO All Amount	Mod 6 Amount
Pitch Env Amount	Mod 7 Amount
Filter Env Amount	Mod 8 Amount
Amp Env Amount	Compressor
Aux 1 Env Amount	
Aux 2 Env Amount	

Samples

White Noise

Pink Noise

Green Noise

Resonant 4K Noise

Soft Noise

Cicada

Buzzed

Chain Link

Grinder

420 HighPass Noise

Tight Boom

Porky

Hollow Thud

Hollow Head

Mid Kick

Slap Kick

Thwang Kick

Resonant K

Boom Kick

Quickick

Punchy Kick

Nice

Short n Sweet

Bumpy

Loose

Solid Thump

Upfront

Good Kick

Metallic

Square

Beefy

Flat

Shorty Thud

SCI Tom Cart Kick

LM-1 Bass Drum

LinnDrum Bass

909ish

808ish

Long Time 808

Cut the Mustard

Electron K

Flab

Solid

Early Nineties

DigiBonk

Woosh Kick

Dirty Woosh

Distorted 09

Grain Granny

Bit Reduction

Back Scatter

Crunchy

Distorted Bump

Reversed

Orangey

Snare Add Rim

Mid Head

Acoustic

Good Hit

Some Head

Supra Snare

Loose Ring

Trick Snare Rim

Resonant Loose

Cool Rim

Another Edge

Cut Snare

Muted Half Edge

High Edge

Cracker

Light Rim

Dry Rim

Pickle-O

Woody Side

Side Stick

Dead Side Stick

Sharp Side

Rim Cut

808 Rim

909 Rim

AcouStick

LinnDrum Rim

Tom Cart Rim

SweetDaOneSnare

808ish

Quickie

Short n Tight

High Short

30 Day Snare

Fat 9009

Funk Sn	Noisy Click	Close Foot Pedal
LM-1 Snare	Splatted Snare	LM-1 Closed
LinnDrum SD	Broken SD	LM-1 Open
Basicly	Ghost of a Snare	LinnDrum HH Closed
Beatbox	Video Game	LinnDrum HH
Machine	Caved Perc	LinnDrum HH Open
Twin	Reverse Snare	Close Tambo
Dry	Edge Heavy	Tight Studio Hat
Short Attack	Pedal Edge	Crack Hat
Digi 8	Pedaled AM	Accent
CompuSnare	Half Edge	HH Dub Plate
Plastic	Open Edge	Dry Tap
Snare Trash	Sharp Closed	Peace Corp
Bucket	Sharp Pedal	Old Timer
Toy Drum	Sharp Half	Blu Pedal
Abrupt	Sharp Open	Fake
What Snare?	Zilch Closed	Open Fat
Canned	Zilch Pedal	Abrasive
Dead Lid	Zilch Open	Tic Tac
Tom Cart SD	Pastey	Noise Hat
Classic	Pastey Half	Reversed
DR55 SD	Heavy Closed	Dirty Pedal
Cold hit	Heavy Open	Barely There
Zippy Thwack	Boss Closed	Click
Crumbly	Boss Open	Quiet
70s Snare	Dark Cl	Shorty HH
Bit Reduce SD	Dark Opn	One Foot Pedal
Distant	Amazon Closed	8080 HH
Filtered SD	Amazon Half	8080 Open
Oil Can	Trash Hat	808ish Maraca
Digital Sweetness	Loose Open Hat	9009 HH

9009 HH2	LinnDrum Ride	808ish Hi Tom
Perc Hat	909ish Crash	808ish Mid Tom
DR55 HH	Tom Splash Cart	808ish Low Tom
Right Foot Pedal	Reverse CY	909ish Tom Hi
Another Perc	Res Hi	909ish Tom Mid
Closing HH	Res Mid	909ish Tom Low
Small Hi Hat	Res Floor	Reverse Hi
Unnatural	Nice Hi	Reverse Mid
Trip Hop HH	Nice Mid	Reverse Low
Aliens	Nice Floor	Clap 9090
Silver HH	Punchy Hi	Layered Clap
Kicky Hi Hat	Punchy Mid	Slap Clap
Large Edge Cymbal	Punchy Low	Digi Clap
Zilch Crash	Hi Maple	NotDisClap
Gong	Mid Maple	PerClapsaLot
Pastey Hit	Low Maple	LM-1 Clap
45 Degree Dust	Blue Tom Hi	LinnDrum Clap
Bell Crash	Blue Tom Lo	808ish
Oriental Hit	Tonic Tom Hi	9090
Higher Cymbal	Tonic Tom Low	Reverse Clap
No Name Crash	Acoustic Hi	How Now
909ish	Acoustic Low	Real Cow
LinnDrum Crash	Tom Splat	Tang Cowbell
808ish Crash	Thudd Tom	Dinky Cow
Hertz Cymbal	Wood World	Short Cow
Flat Ride	SCI Tom Cart	80s Cowbell
Medium Bell	LM-1 Hi Tom	LM-1 CowB
Blue High Ride	LM-1 Lo Tom	LinnDrum CowB
Small Gong	LinnDrum TomHi	OG 808 Cow
Smooth Ride	LinnDrum TomMid	Reverse Cowbell
Shortcut	LinnDrum TomLo	Cross Stick

Light Cross	808ish Lo Conga	Punch n Drag
Low Cross	LM-1 CongaHi	Nutrino
Jam Block H	LM-1 CongaLo	Solar Explosion
Jam Block L	LinnDrum Conga	Wrinkled
Keys	Tambouriney	Quark
Guiro	Tambo Ring	Particulate
Castanet	TamBell	Hadron
Drag That Click	Metal Tamb	Flutter
Moon Golf	Wood Tamb	Broken Toy
Real Shaker	LM-1 Tamb	Click Reduction
Cabasa A	LinnDrum Tamb	Fazzle
Cabasa B	Raucous Tamb	Grunt
LM-1 Cabasa	Tri HiFi	Bucket Bottom
LinnDrum Cabasa	Short Triangle	Charged Porceline
Real Fingers	Noisy Bell	Brrrrr
Cute Drum Robot	Flexi A	Shorted
Digi Click	Flexi B	BeatBox
Bit-o-Clap	Stick on Metal	Tap That
Hot Tabla Lo	Clank	Boxer2
Hot Tabla Mid	Sounds Like?	Flat Perc
Hot Tabla Hi	Abrupt Metal	Flat Click
Hot Tabla Highest	808ish Clave	Filtered Perc
Tabla Bounce	Rico Clave	Vacant
Udu Bounce	Phazey Click	Hybrid Click
Udu u Do 1	Coming Up	SCI Tom Cart Laser
Udu u Do 2	Choked Perc	SCI Tom Scratch
What Conga	Hollow Box Lid	Needle On
Conga 1	Oil Drum	Outta Time
Conga 2	Canned Perc	Sine 130.81 Hz
Conga 3	Half Full	Sine
808ish Hi Conga	Pla-stick	Sawtooth

Square	Orient	Corn
WmBell	HighPipe	Flute 2
RdBell	Mass	Med Pure
R2Bell	ReedOrg	Tuba
W2Bell	OrgAhh	FullBell
FmtBell	MelOrg	Bell
FzReed	Clarinet	Pinch
FmtAOh	AhhFem	Clustr
FmtAhh	AhhHom	M.Pinch
Banjo1	AhhBass	VoxPnch
TriPlus	RegVox	OrgPnch
DisBel	Vocal1	AhhPnch
Pulse2	Vocal2	PnoOrg
Pulse3	Harmony	BrReed
SqrReed	Bass	NoFund
Oohh	Guitar	ReedHrm
Eehh	Nice	LiteFund
Feedback	WWind	MelOrg
Piano1	Oboe	Bell Partials 1
E.Pno	Harp	Bell
M.Harm	Pipe	VS 84
VS 23	Hack1	VS 85
HiTop	Hack2	VS 86
WmReed	Hack3	VS 87
VS 26	Pinch	VS 88
Hollow	BellHrm	VS 89
BellOrg	BellVox	VS 90
BassBell	Hi Harm	VS 91
Tine1	Hi Reed	VS 92
SynBell	BellReed	Piano2
VS 32	WmWhistl	Bell Partials 2
		VS 95

Support

Troubleshooting

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

The sequencer has stopped running.

Make sure MIDI: Clock Mode in the System menu is set to Auto, Master, or Off, or—if set to Slave—that MIDI: Clock In is set to MIDI Port or USB and that MIDI clock is actually available to that port.

An oscillator or filter sounds strange or out of tune.

In the System menu, choose Calibrate Analog Oscillators and Filters.

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

The Real Time FX sliders are not behaving as expected or don't seem to go full range.

In the System menu, choose Calibrate Slider 1 and Slider 2 Position and follow the instructions to calibrate the sliders.

Still experiencing a problem?

From the System menu, choose Reset System Parameters.

Contacting Technical Support

If you are still having a problem with Tempest, contact Technical Support at support@davesmithinstruments.com. Please include your Tempest's serial number, the versions of the operating systems (from the System menu, choose Show System Information), 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 Tempest 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 Tempest 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 Tempest'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 strongly suggest insuring it and packing in the original packaging. Damage resulting from shipping a product with insufficient packaging is not covered by warranty.