super sixteen

extralife instruments

DATA this stepped encoder adjusts the selected sequence parameter, like patch number or tempo.

STEP BUTTONS select and toggle steps on and off. Press once to select and again to toggle. Inactive steps are activated automatically when selected.

RECORD enables motion recording. Press and hold while adjusting PITCH, OCTAVE, LENGTH, or CV to record changes to the currently playing steps in realtime.
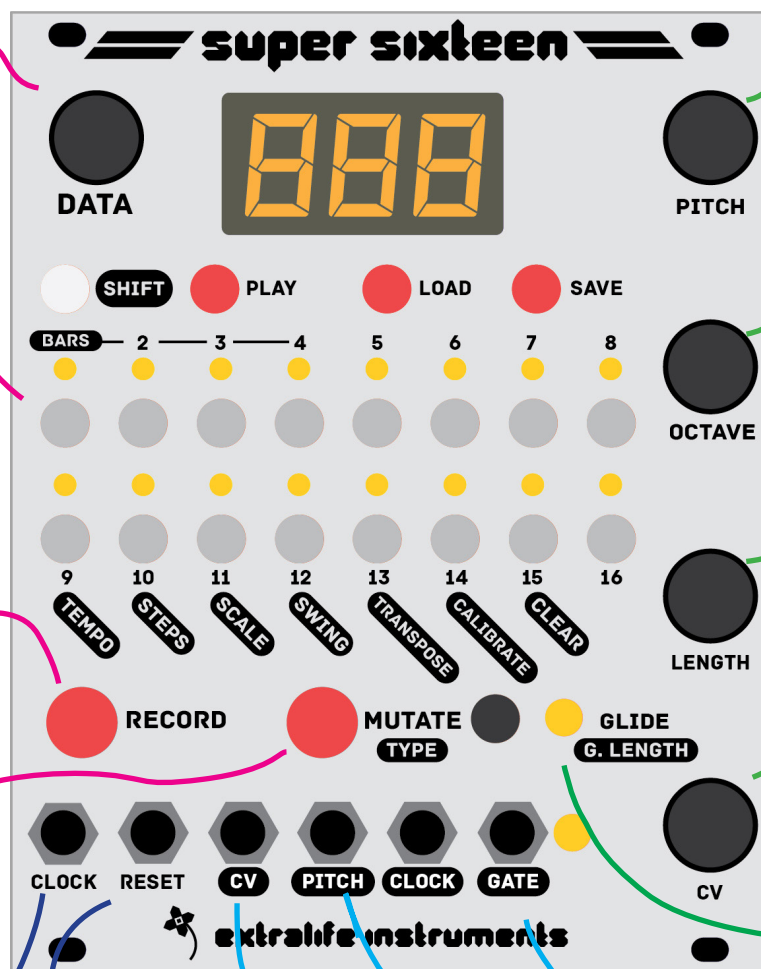
MUTATE activates the selected "mutation" effect. Adjust DATA while holding MUTATE to change the effect depth.

CLOCK input accepts a 1-pulse-per-step clock signal and advances the sequencer in sync to external gear.

RESET input accepts a pulse to restart the sequence, or use as an external gate for the **MUTATE** button (see ch. 13)

PITCH Adjusts pitch output for selected step. Range +/- 12 semitones

OCTAVE Adjusts pitch output for selected step in increments of 12 steps. Range +/- 4.

LENGTH Adjusts the duration of the selected step, as a percentage of a single step's length. Range 0-400%.

**CV** Adjusts the value of the secondary CV output for the selected step. Range 0-100%

GLIDE Activates portamento, or a "slide" to the selected note over its duration.

CV output sends out an unquantized control voltage controlled by the CV parameter for each step (0-8v)

PITCH output sends quantized control voltage set by the PITCH and OCTAVE parameters for each step (0-8v)

GATE output sends 5V gate signals for each active step, the duration of which is set by each step's LENGTH parameter

1. SEQUENCE CONTROLS
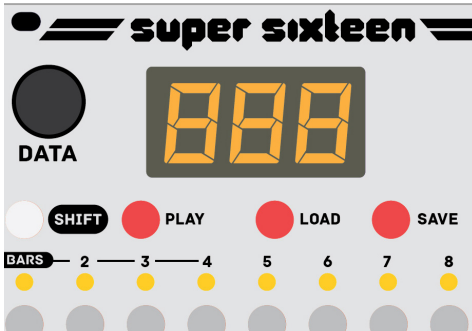
SHIFT Press [SHIFT] plus another button simultaneously to access its secondary or "shift" function (these are outlined in black labels on the panel). Buttons that have shift functions include Steps 9-16, Record, Mutate, Glide, and Play. When you are editing a parameter, press [SHIFT] again to exit back to the main note data display.

PLAY Start or stop the internal sequencer playback. [SHIFT]+Play resets to the start, the same as a pulse to the RESET input. A pulse to the CLOCK input will stop the internal sequencer.

Note: Pressing play while the CLOCK input is receiving a signal generally has no effect - if the internal tempo is set much faster than the external clock, however, pressing play may cause the sequencer to gain a step relative to the external clock before it syncs again.

LOAD/SAVE enables you to save the active sequence or load a new one. To save a sequence to memory, press **SAVE** once, and then use the **DATA** knob to choose the PATCH NUMBER (1-99) [0-99] where this sequence will be saved. To confirm it, press SAVE again. Press [SHIFT] to cancel saving. Once saved, the sequence can be recalled at any time. It's a good idea to save your sequences frequently, since it's easy to radically alter the patch memory.

Note: While selecting a patch number, the

decimal point after the number indicates that there is already a sequence saved at that patch number.

Once you've chosen a **PATCH NUMBER** to save your sequence, you can double-tap **SAVE** to overwrite it with the active sequence. Get in the habit of doing this whenever you make a change you like! You can likewise double-tap **LOAD** to reload the last-saved sequence if you make a change you dislike.

To load a sequence, press **LOAD** once, and then use the **DATA** knob to choose a PATCH NUMBER to load. Press **LOAD** again to confirm and load the sequence

Note:If there is no sequence in that patch number, a blank sequence will be loaded.

When a new sequence is loaded, the sequence will "pick up" playback in real-time at the same place in the last bar of the sequence, making synchronized songs and pickup phrasing dead simple.

2. STEP EDITING
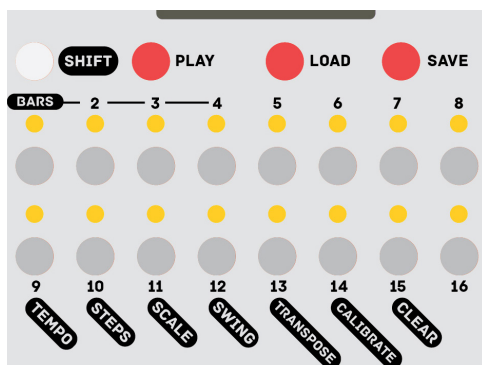
Step editing is accomplished by pressing the the 16 step buttons in the center of the panel. The LEDs adjacent to each button indicate whether that step is active or inactive. This display indicates the 16-step rhythm of the sequence.When selected for editing, its LED will **blink** on and off. If the selective step is active, it will be mostly on and blink off briefly. If it's inactive, it will be mostly off and blink on briefly.

To select a step, press the corresponding button **once**.

If inactive, that step will be automatically activated when selected. To deactivate a step, press it **again**.

Once a step is **selected**, you can edit its PITCH, OCTAVE, DURATION, CV, and GLIDE values with the corresponding knobs and button on the right side of the panel. These values only change when the knobs are moved and the display updates to reflect the new value. When a step is selected, the display will update to show its value for the last edited parameter.

Only active steps will trigger the gate output and change the PITCH/CV outputs. Inactive steps **do not** have any effect on the seqeuncer, but their values are saved with the sequence.

While the sequencer is playing, the LEDS will blink as each step is played to show a "Running light" indicating the current step.

Tap once to select/activate a step

Tap again to deactivate
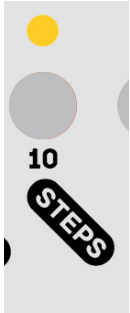
Press a button to select a step then edit it by turning the knobs.

PITCH & *OCTAVE* together control the Pitch output voltage.

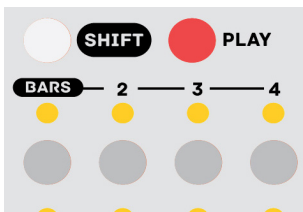*CV* controls the CV output voltage.

DURATION controls the length of the pulse sent to the GATE output.

5. MULTI-BAR SEQUENCES

The default sequence length is 16 steps, but sequences of any length from 1-64 steps can be programmed. To access steps 17-64, make use of the **BARS** buttons (SHIFT+1 thru 4) and the **STEPS** parameter (SHIFT+10). This feature is analogous to "Pages."

To adjust the sequence length, select **STEPS** (SHIFT+10), and then select a number of steps using the **DATA** knob. If you continue holding shift, the knob will skip through common sequence lengths divisible by 4 (4, 8, 12, 16, 24, 32, 48, 64). Release SHIFT to adjust 1 step at a time and create odd-length sequences if desired.

Change seq. length:
 [SHIFT] + 10 (STEPS)
Adjust with DATA knob

View and edit **BARS**:
[SHIFT] + 1 (Steps 1-16)
[SHIFT] + 2 (17-32)
[SHIFT] + 3 (33-48)
[SHIFT] + 4 (49-64)

To view and edit a bar of 16 steps, press SHIFT and STEP 1, 2, 3, or 4, indicated by the "**BARS**" label. This will update the step display LEDs to show the active steps for that bar.

Note: A subsequent bar may be edited and have active steps, but it will not play unless the **STEPS** parameter is adjusted so the sequence is long enough to reach it.

Bars may be **COPIED** and **PASTED** within a sequence to create repetitions. To copy and paste a bar, press SHIFT, then press the button for the bar you wish to copy (the source), then (while holding SHIFT+source) press the button for the bar you want to paste it to (the destination). The display will flash "CPY" when a bar is successfully pasted.

Copy/paste a bar:
[SHIFT]+ SOURCE + DESTINATION

Example:
[SHIFT] + 1 + 2 = Copy bar 1 to bar 2

[SHIFT] + 2 + 4 = Copy bar 2 to bar 4

4. MOTION RECORDING

RECORD

Hold **RECORD** while adjusting PITCH, OCTAVE, DURATION, or CV to make quick changes to the sequence

Step parameters can also be editing in real-time using the **RECORD** button.

While the sequencer is playing, press and hold RECORD and adjust any of the knobs for PITCH, OCTAVE, DURATION, or CV to record those changes to the sequence as it plays.

The changes are only recorded while the button is held down, and only the first knob adjusted during recording is recorded. Only active steps will be updated. To record another parameter, release the record button and press it again as the sequence loops during playback. It is good to get in the habit of releasing the record button quickly as it is easy to overwrite your sequence with new notes.

It is also a good idea to **SAVE** your sequence before recording in new data. Double-tap the SAVE button to write it to the last-used patch number. Then record your new part. If you aren't happy with the change, just double-tap LOAD to "undo" the changes and reload the previous version.

Note: during a live performance, motion-recording using the PITCH parameter can be quite dangerous as it can introduce non-diatonic "wrong notes" into your sequence. These can be avoided by selecting a SCALE for the sequence to exclude such notes and allow greater improvisation (see the SCALE section). However, in a typical patch, recording real-time changes to OCTAVE, DURATION and usually CV is relatively "safe" for live performance, though it is still a good idea to save your patches frequently for reloading.

Real-time rhythm: hold SHIFT and **tap a rhythm** on RECORD to activate steps during sequence playback.

6. CV OUTPUT MODES

The secondary control voltage output "CV" and its corresponding knob can be used to create several different types of control signals - stepped, smoothed, and quantized 1v/oct pitch. (This feature is only available in firmware version 1.2 and later.)

Hold **SHIFT** and turn the **CV** knob to adjust the **CV** output mode to any of the following modes. This setting is saved per-sequence and resets to default stepped linear CV when a blank sequence is loaded or the **CLEAR** function is used.

⌐LI - STEPPED CV MODE

In the default stepped CV mode, the CV output jumps to the next value when an active step is reached. The output ranges from 0-100, scaled from 0-8V. This can be thought of as "velocity," providing a constant linear scaled CV output per-step.

LFo - SMOOTHED CV MODE

In smoothed CV, or "LFO" (low frequency oscillator) mode, the CV output ramps up or down continuously to the next value over the course of each step, creating smooth transitions from each value to the next.

This is especially useful when using the CV output to control synth parameters like filter frequency, FM modulations, or wavetable positions, where the continuous "in-between" values create audible timbre changes. This can also be thought of as a seqeunced arbitrary envelope generator.

Using motion recording with LFO mode is especially satisfying, as it can more accurately reproduce expressive control movements than stepped mode.

int - PARAPHONIC INTERVAL MODE

The paraphonic CV Modes allow the **CV** output to be used as a 1 volt/octave scaled control, exactly like the **PITCH** output. In "Interval mode" the value of the CV output tracks relative to the value of the Pitch output (controlled by the Pitch/Octave knobs).

In this mode the CV output can be offset from the Pitch output by a **musical interval** from -24 to +24 steps (2 octaves up and down). This is ideal for creating harmonized melodies or chord sequences. If a non-chromatic scale is selected using the **SCALE** function, the CV output will also be quantized to the nearest diatonic scale degree (musical note within the scale), just like the Pitch output.

not - PARAPHONIC NOTE MODE

"Note" mode is also scaled for 1v/octave pitch output, but in this mode the CV output is decoupled from the "Pitch/Octave" controls. You can use the CV knob to select an **arbitrary pitch** for each active step and program a completely separate melody from the main sequence.

However, the CV output only changes when the selected step is active, so it shares the same rhythm as the main sequence. (By using an external gate sequencer, it is possible to program two completely parts.)

In this mode the CV output can be set to pitch values from C1 to C5 (1v to 5v). This mode always uses named musical pitches rather than numbers. This output also obeys the sequence's scale quantization and transposition values, allowing lower or higher ranges to be achieved if desired (e.g. 0v-4v, or 2v-6v).

This mode is ideal for programming basslines which complement the main melody. It can also be used for programming counterpoint melodies or chords more easily by those who are familiar with music theory.

7. [SHIFT] FUNCTIONS

Additional sequence parameters can be edited by pressing and holding [**SHIFT**] and pressing another button, then adjusting that parameter using the **DATA** knob. These values are **saved** with each sequence (except CALIBRATE and CLEAR).

Most buttons which have a secondary function show that function in

OUTLINED TEXT.
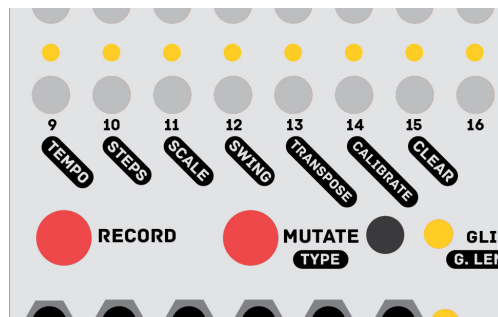
SELECT BAR   *SHIFT + 1/2/3/4*
To edit steps after 1-16, you can jump to the next **BAR** by pressing SHIFT+[BAR NUMBER]. Buttons 1-4 are marked **BAR** to indicate this function. Keep in mind than in order for steps after 16 to be played, the **STEPS** parameter must be adjusted as well.

TEMPO   *SHIFT + 9*
Controls the speed of the sequence, in beats per minute (BPM).

NOTE: When loading a new sequence, the sequencer tempo is **only** adjusted if the sequencer is **PAUSED**. When a new sequence is loaded during playback, it will continue at the same tempo as the previous sequence to avoid sudden jumps.

STEPS   *SHIFT + 10*
Controls the number of steps in the sequence (Range: 1-64). See the section on **MULTI-BAR SEQUENCING (**p 11).

SCALE   *SHIFT + 11*
Selects a musical scale to constrain the values for the PITCH parameter.
See **SCALES** (page 10).

SWING   *SHIFT + 12*
Adjusts the timing of even-numbered steps to create a "swing" or "shuffle" rhythm. A default value of 50 produces a "straight" rhythm, while higher values produce more swing. The sequencer can accept a straight Clock input signal and still play swung notes, but will produce a "swung" clock output when the swing parameter is adjusted.

TRANSPOSE   *SHIFT + 13*

Adjusts the pitch output of the entire sequence up and down in increments of 1 semitone. This enables different sequences to be played in different "keys" without adjusting oscillator tuning or step editing. Range +/- 36.

CALIBRATE   *SHIFT + 14*

Enters calibration mode to tune the voltage scaling. See **CALIBRATION** (pg. 13)

CLEAR   *SHIFT + 15*

Deactivates all steps and resets all note values to their default (zero for PITCH, OCTAVE, and CV, and 80 for DURATION).

FACTORY RESET   *SHIFT + 15 (five times)*

To reset the module to factory settings and **erase all stored sequences**, hold SHIFT and then the 15 button five times in a row. The screen will show "CLR" then "E - R - S" (one letter each press), then blink "ERS." Press 15 a fifth time to erase all sequences.

SONG MODE   *SHIFT + 16*

This lets you choose a sequence and loop counter to chain sequences together. See the **SONG MODE** section for more details. ((Firmware 1.1 and later)

NEXT SEQUENCE   *SHIFT + LOAD*

Immediately loads the next sequence selected in **SONG MODE.** (Firmware 1.1 and later)

RESET CLOCK   *SHIFT + PLAY*

To reset the sequence clock to Step 1, hold shift and press play. When the play button is pressed or the next clock pulse is received, the sequence will restart. The same thing can be achieved by sending a pulse to the RESET input jack.

CV MODE SELECT   *SHIFT + CV KNOB*

To use the CV output as a paraphonic pitch control or a smoothed LFO, hold shift and turn the CV knob to the desired setting (see Ch. 6) (Firmware 1.2 and later)

NOTE AUDITION   *SHIFT + PITCH KNOB*

To hear the pitch of a note while editing, press shift and turn the PITCH knob to the right. Thee screen will show Aud ("audition") or oFF. When activated, the gate output will be activated and the selected step's pitch sent to the PITCH output whenever the **PITCH** or **OCTAVE** knobs are changed. This allows you to program sequences by ear more quickly. (Firmware 1.2 and later)

8. MUTATIONS
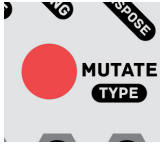
Pressing and holding the **MUTATE** button activates the selected mutation effect while the button is held. While MUTATE is held, you can turn the **DATA** knob to adjust its effect depth. This does different things depending on the selected mutation - see the table below.

Pressing **SHIFT+MUTATE** will enter the mutation selection menu. Use the **DATA** knob to select a mutation. Press SHIFT or another button to exit the menu. The available mutations are shown in the table.

To **RECORD** a mutation sequence, you can press and hold **RECORD**, then tap the **MUTATE** button on each step that you want the mutation to be active, just as you would when using it in real-time, then release the **RECORD** button.

To **ERASE** a mutation sequence, you must simply record over it. So, press and hold RECORD, then tap MUTATE once to initate recording of mutation data, then release the MUTATE button and continue holding record to "erase" mutation data for as long as you like (one complete loop of the sequence will erase it all).

EXTERNAL TRIGGERING:

You can also trigger mutations with a gate input. This produces the same effect as pressing the **MUTATE** button but frees up your hands. To use the **RESET** input as an external trigger input for the mutation function, enter calibration mode and press button 11 to toggle between "MUT" (mutate) and "RST" (reset). (See chapter 13 for diagram).

SUGGESTED USES:

Mutations can be used creatively to add real-time variation to recorded sequence. Try "playing" the mutate button rhythmically to introduce varied repetitions or "fills" in your sequences. While holding the mutate button, adjust the effect depth step-by-step to create variations of increasing intensity.

Recording mutation data can be especially fun with the RANDOMIZE mode, because you can create semi-random sequences in which certain sections vary each time it's played. Use it in combination with a particular SCALE mode to create a generative sequence that never quite repeats itself twice.

The "Turing" mutation modes can be used for generative sequencing inspired by their namesake module. Turing 1 will alter your pitch data, Turing 2 will create new rhythms, and Turing 3 will create brand new sequences from scratch.

| Display	Mutation	Adjustment	Description
rEP	Repeat	Number of steps	Repeats a short section of the sequence
rEU	Reverse	N/A	Reverses playback while held
oct	Octave shift	Num. of octaves up/down	Transposes pitch up/down by 12 steps
trb	Transpose	Num. of steps up/down	Transposes pitch by steps (within scale)
GLd	Auto-glide	Glide duration	Activates glide for every step while held
FrZ	Freeze	N/A	Holds the current pitch and activates the gate
StP	Stop	Duration	Pitch slowly ramps down to 0V
rnd		Randomness	Transposes pitch by random amount (and conforms to selected scale)
Stt	Stutter	Stutter-step duration	Adds short repeated steps on inactive notes
roL	Roll	Step subdivision	Subdivides clock and doubles, triples, etc notes
tu1	Turing 1*	Randomness	Melody generator: Same as "Randomize," but new pitches are stored in the active sequence.
tu2	Turing 2*	Density	Rhythm generator: Randomly adds new steps using existing pitch data to create new rhythms but preserves harmony.
tu3	Turing 3*	Density	Sequence generator: creates completely new random sequence data including pitch, octave (+/-2), gate(20-170), CV (0-90), and glide (10% rate).
cho	Chord**	Interval (semitones)	Sets CV output to a fixed harmonic interval relative to pitch output
ch9	Chord** Quantized	Interval (semitones)	Same as chord, but obeys scale selection
Sub	Sub Osc**	Num of octaves up/down	Sets CV output to an octave interval relative to pitch output (for use as sub-oscillator)
Uib	Vibrato**	Intensity	Adds a vibrato effect to pitch outputs

* = Only available in firmware version 1.1 and later | ** = Only available in firmware 1.2 and later

9. GLIDE/PORTAMENTO

Glide (aka "portamento" or "slide") may be activated for any active step by selecting a step and then pressing the **GLIDE** button. When active, the pitch output will slowly ramp up or down to that step's pitch over its duration. The ramp time begins at the beginning of the step.

The glide duration may be adjusted by pressing **SHIFT+GLIDE** and adjusting the value with the encoder. The value goes from 0-400, and like the "duration" knob represents a percentage fo the current step length. (A value greater than 100 will take longer than one step to complete, and the pitch output may not reach the final value before the next step activates.) The glide duration is saved along with the other sequence data.
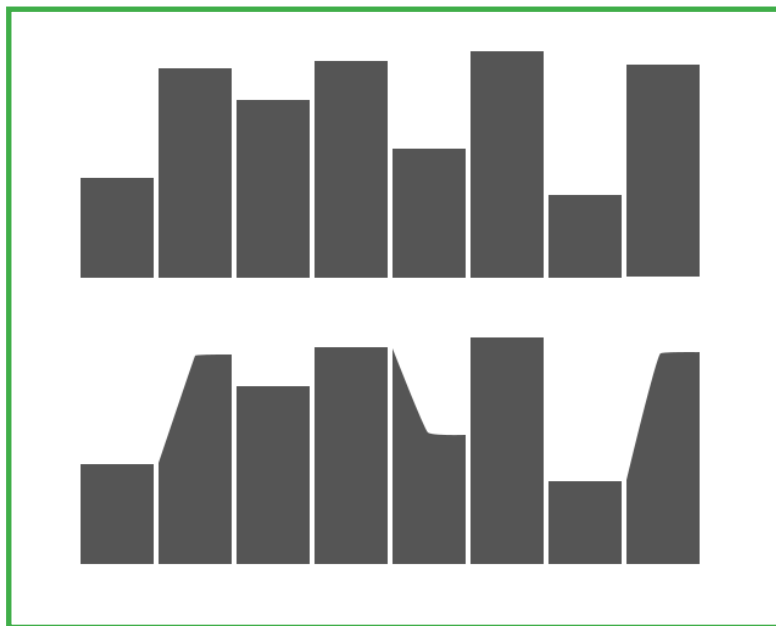
GLIDE
G. LENGTH

A sequence of control voltages showing the sharp transitions without glide (above) and the smoother "ramp" transition with glide (below)

10. SCALES

Pressing **SHIFT+11** will enter the scale selection menu, where you can use the DATA knob to select a scale.

The selected scale will quantize the sequence to and restrict pitch selection to notes within the scale. Any previously entered sequence data will remain unedited, but will be quantized in real-time to the selected scale.

RANDOMIZE and TRANSPOSE mutations will also obey the selected scale quantization and produce variations which remain in-key with the sequence.

When a scale type besides Chromatic is selected, non-diatonic pitch values will be skipped when adjusting the PITCH knob for any step.

Display	Scale
chr	Chromatic
MAJ	Major
Min	Minor
PEn	Pentatonic
PEM	Minor pentatonic
bLu	Blues
bLM	Minor blues
Phr	Phrygian
dor	Dorian
Hho	Whole tone

11. SONG MODE

Sequences can be chained together one after another using **SONG MODE**. Enabling chaining consists of setting two special parameters for a given sequence:

1. **SONG SEQUENCE** (⊑⊓♀) - the patch number of the sequence to be played after the current sequence. [0-99]. Setting this to zero will deactivate song mode (default).

2. **SONG LOOPS** (⌐P⊑) - the number of times the current sequence should loop before advancing to the next sequence [0-99]. Setting this to Zero will loop the current sequence indefinitely (default).

Both parameters can be edited by pressing **SHIFT+16** in sequence mode. The display will show either ⊑⊓♀ or ⌐P⊑ to indicate which parameter is selected. To edit the other, simply press SHIFT+16 again. Turn the DATA knob to edit each parameter as desired.

IMPORTANT: Editing these parameters during playback can produce unexpected jumps to the next sequence, erasing your changes! It is best to edit these parameters while paused.

After both parameters are set, save the sequence to memory by double-tapping SAVE (otherwise these settings will be lost when the next sequence is loaded!). Then reset playback by pressing SHIFT+PLAY (this resets the sequence loop counter). Start playback by pressing PLAY or using an external clock.

The sequence will play through the number of times specified in the LOOPS parameter, then the patch number selected in SONG SEQUENCE will be *loaded automatically* and start playing in time. This can be used to create longer, song-length compositions that play in sequence.

If either parameter is set to zero, or if the selected patch is empty, the current patch will simply continue playing.

Song mode can be used *without* automatic advance by choosing a next sequence and setting the LOOPS parameter to zero. Just press **SHIFT+LOAD** to instantly load the next sequence whenever desired. This can be used to create sequential "sets" of sequences without adhering to a strict song format and length.

Note: Song mode is only available in firmware version 1.1 and later.

12. CALIBRATION

To achieve accurate tuning of the analog 1v/octave pitch output, it must be calibrated using **digital multimeter**, or an **electronic tuner and well calibrated oscillator**.
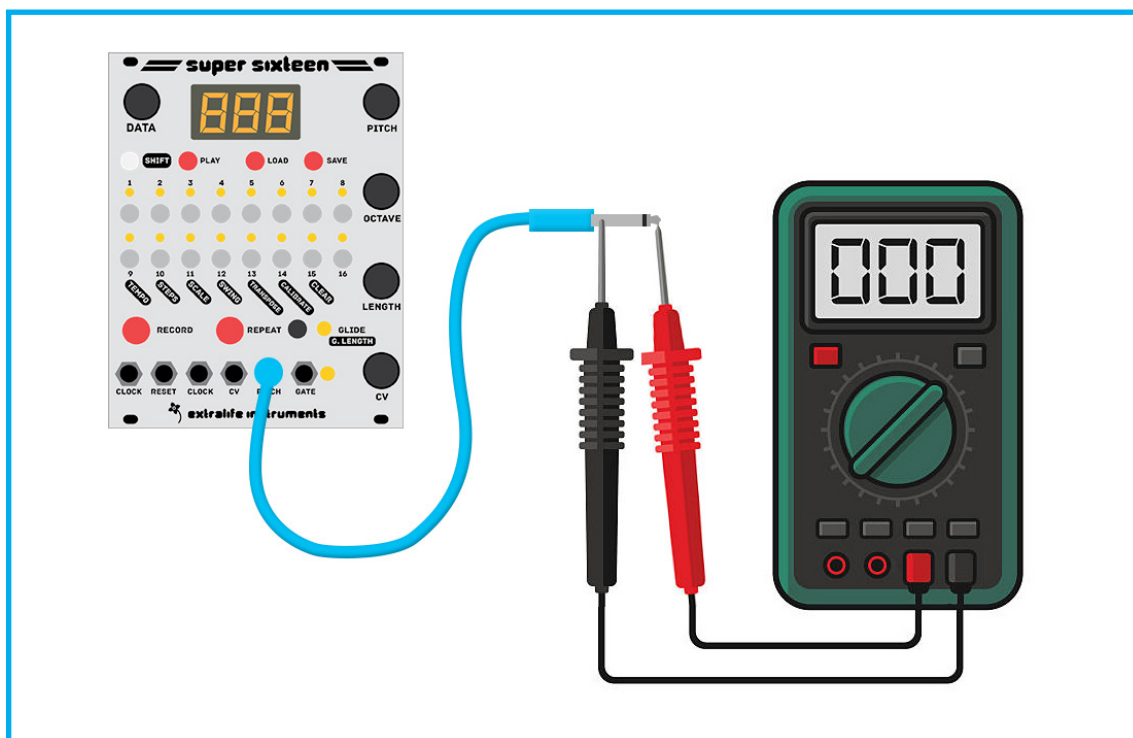
MULTIMETER

Connect a 3.5mm TS cable to the PITCH output of the Super Sixteen. Set your multimeter to read DC volts (10V range minimum). Connect the negative/ground/common (black) input of the multimeter to the SLEEVE of the TS cable using an alligator clip. Connect the positive/red input of the multimeter to the TIP of the cable.

ELECTRONIC TUNER

Connect the PITCH output to the 1V/OCT input of a well-calibrated oscillator. Using a simple waveform (like a sine or triangle wave), connect the output of the oscillator to a digital tuner. (Make sure to attenuate the output if necessary, as eurorack level signals can damage equipment made for instrument or line level inputs).

Enter calibrate mode on the Super Sixteen and select the lowest output voltage (button 1). Turn on the tuner and use the COARSE tune of the oscillator to set the pitch to the lowest note that the tuner can easily pick up. Use the FINE tune of the oscillator to set it to an exact concert pitch (typically C1 or A1).

Connect a multimeter to the pitch output as shown. Alligator clips are helpful to secure the multimeter probes if a direct 3.5mm to banana adapter is unavailable.

CALIBRATION PROCEDURE (CONTINUED)

Press *SHIFT+14* to enter calibration mode. In this mode buttons 1-8 let you choose different octaves, which will set the PITCH output to exact voltages, from 1v, 2v, 3v, up to 8v.

Press 1 and use the DATA encoder to set the calibration to 1.000V as exactly as possible. (Use the CV knob instead to adjust the CV output voltage).

Press 2 and use the encoder to set the calibration to exactly 2.000 volts, or 1 octave above your tuned pitch at 0V. It is common to have to adjust by 5-20 "units" of correction. Each unit represents about 0.002 volts, or about 3 cents of concert pitch.

Press 3 and repeat the tuning at 3 volts. Continue all the way up to 8 (8 volts). You may have to tune your oscillator lower than initially in order to use your tuner at the top of the pitch range.

IMPORTANT: When you are satisfied that all octaves are playing in tune, press **SAVE** to store the calibration values to memory. These values are saved to EEPROM and will persist even after a factory reset. If you have made and error and want to discard the new calibration values, press SHIFT to return to sequence mode.

SECONDARY CV OUTPUT CALIBRATION - FOR PARAPHONIC SEQUENCING

If you are planning to use the secondary CV output as a 1v/oct pitch control, then it must also be calibrated to match the PITCH output. The procedure is the same as with the PITCH output. Connect a cable to the CV output and connect to either an oscillator and tuner or a multimeter. When calibrating, instead of the **DATA** encoder, adjust the **CV output**'s pitch using the **CV knob**.

The **CV** output can also be tuned to the primary **PITCH** output much like tuning strings on a guitar. (This may produce a more musically pleasing result than tuning both to exactly 1v/octave, esp. when playing chords.) Connect each output to two oscillators' 1v/oct inputs, then enter calibration mode and choose an octave using buttons 1-8.

If the **PITCH** output is already calibrated satisfactorily, you can simply adjust the tuning of the **CV** output to match the two oscillators' frequencies as closely as possible. You must adjust the second oscillator's tuning to roughly match the first oscillator. Then listen to the "beat frequency" of the two sounds and adjust the CV knob on Super Sixteen until the "beat" slows down to a nearly imperceptible level. Repeat for each octave as you would for each pair of strings on a guitar.

13. SETTINGS

While in calibration mode, several other settings are available to adjust:

- **BRIGHTNESS** (button 9, DATA knob)
- **RESET/MUTATE** (button 11, toggle)
- **INVERT ENCODER** (button 13, toggle)
- **NOTE NAME DISPLAY** (buttons 15 and 16)

CALIBRATION VALUES

Use buttons 1-8 to set the **PITCH** and **CV** outputs to exact octave values, and then calibrate them using the **DATA** encoder and **CV** knob respectively.

Button 1 should output exactly 1 volt, 2 should be 2 volts, etc.

(In firmware version 1.0, button 1 set the output to 0v and buttons 2-9 were used for 1-8v).

NOTE NAME / NUMERIC DISPLAY

While in calibration mode, you can press buttons *15* and *16* to choose between two types of note display. This will affect what shows on the display when editing PITCH and OCTAVE values.

Press 15 to choose "***Note***" mode (⌐◻Ŀ). Notes will display as C0, B1, D3, etc, reflecting traditional MIDI/piano note names.

Press 16 to choose "***Numeric***" mode (⌐◡∏). Notes will display as numbers from -12 to +12 and octaves from -4 to +4, reflecting chromatic scale degrees.

This option is only available in firmware version 1.1 and later.

1 2 3 4 5 6 7 8

9 10 11 12 13 14 15 16
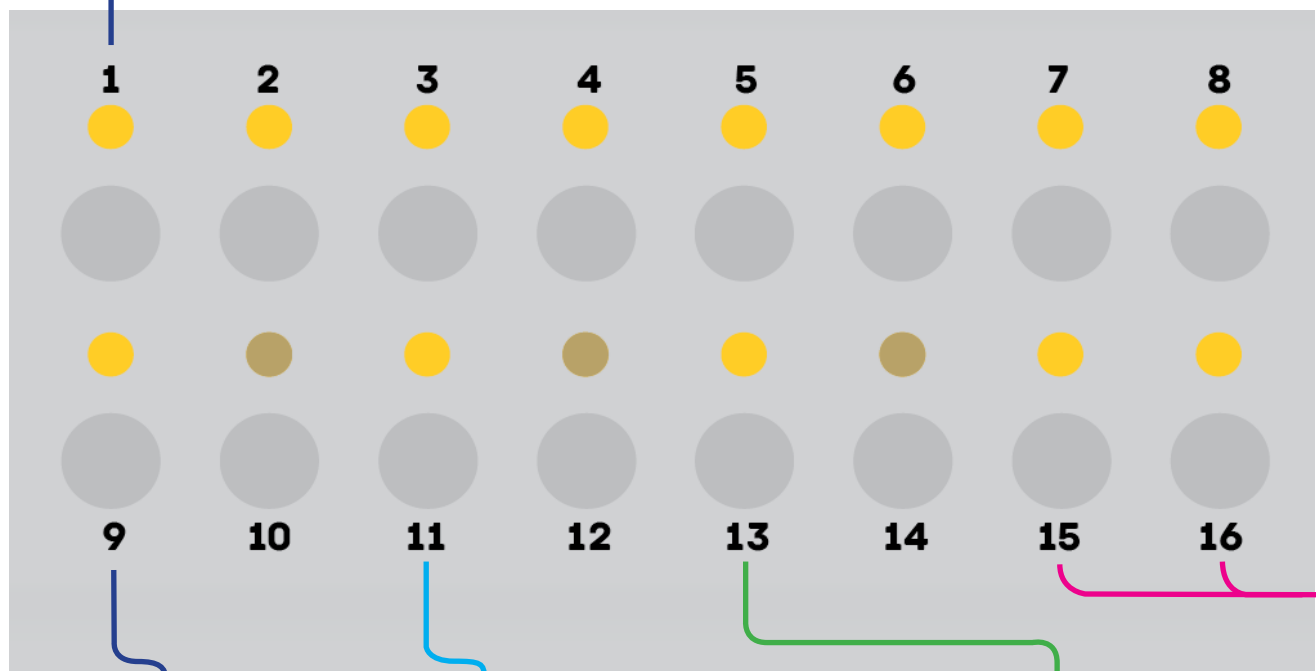
BRIGHTNESS
Adjust the LED screen brightness by pressing 9 then turning the DATA encoder. (Range 1-5).

(Firmware v1.1 and later)

RESET/MUTATE
Use the "RESET" gate input as an external mutation trigger by pressing button 11 and toggling between "⌐ˊ϶Ŀ" (RESET) and "∏◡Ŀ" (MUTATE).
(Firmware v1.2 and later)

ENCODER INVERT
if your DATA encoder changes numbers in the opposite direction (clockwise/anticlockwise), press button 13 to invert its operation (INV/REG)

14. SPECIFICATIONS

Dimensions:
Height: **129.5mm**
Width: **102mm** / *20 HP* (horizontal pitch)
Rear Depth: *38mm*
Front Depth: **16mm** (aka knob height)
Total Depth: **55mm**

Electrical characteristics:
Max current draw: *160mA* (+12v) / *5mA* (-12v)
Pitch output voltage: **0-8** volts
CV output voltage: **0-8** volts
Gate output voltage: **0-5** volts
Clock output voltage: **0-5** volts

Clock input voltage: **10v** maximum
Reset input voltage: **10v** maximum

Power connector:
Super Sixteen requires a standard "Eurorack" -12V / +12V power supply (2x5 pin connector). The red stripe of the ribbon cable (-12V side) must be oriented on the same side as the "Red stripe" marking on the circuit board.

The complete manual can be found online at:
http://extralifeinstruments.com/docs/super-sixteen/manual.pdf