Quick Start Guide

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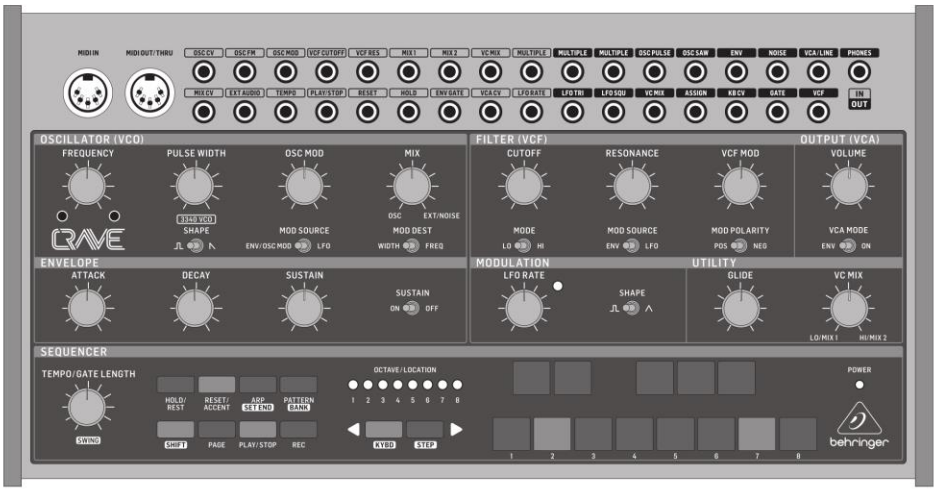


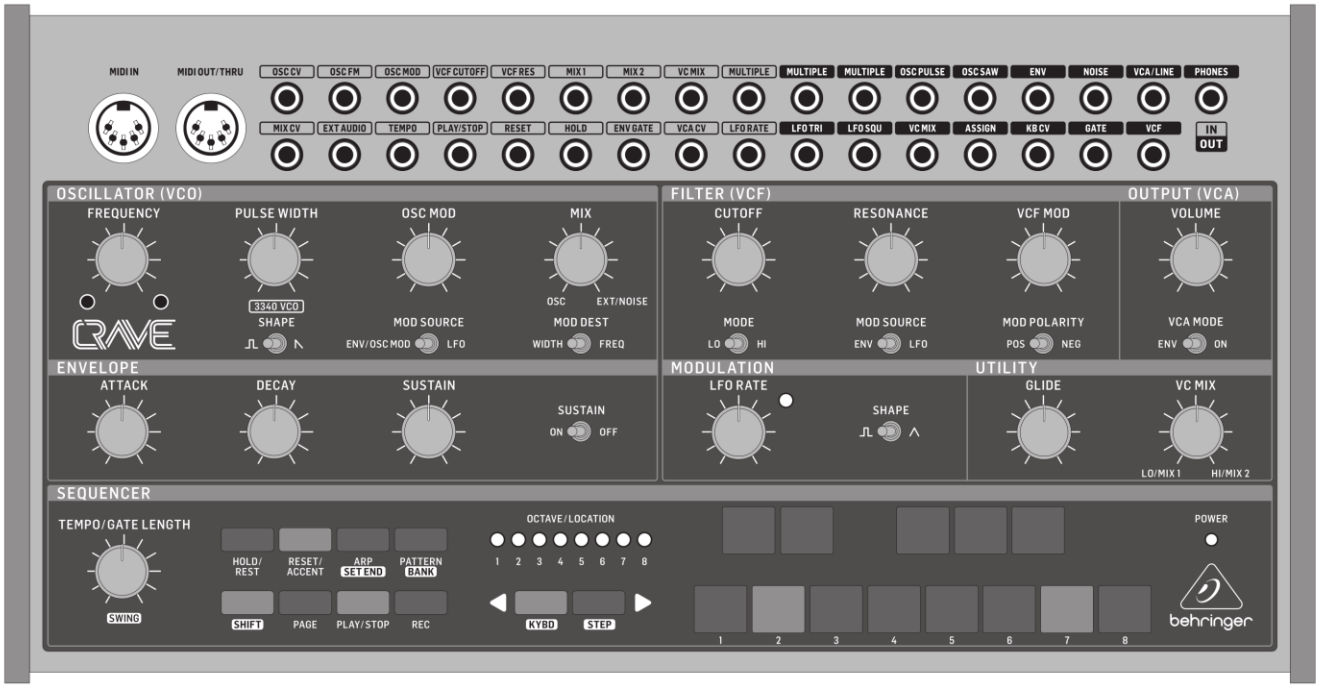
CRAVE

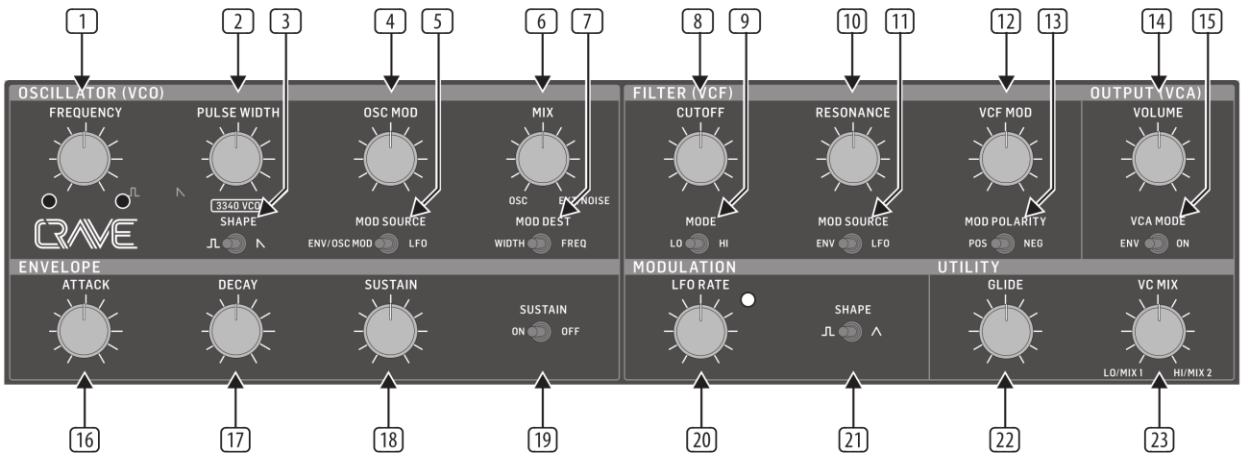
Analog Semi-Modular Synthesizer with 3340 VCO, Classic Ladder Filter, 32-Step Sequencer and 16-Voice Poly Chain

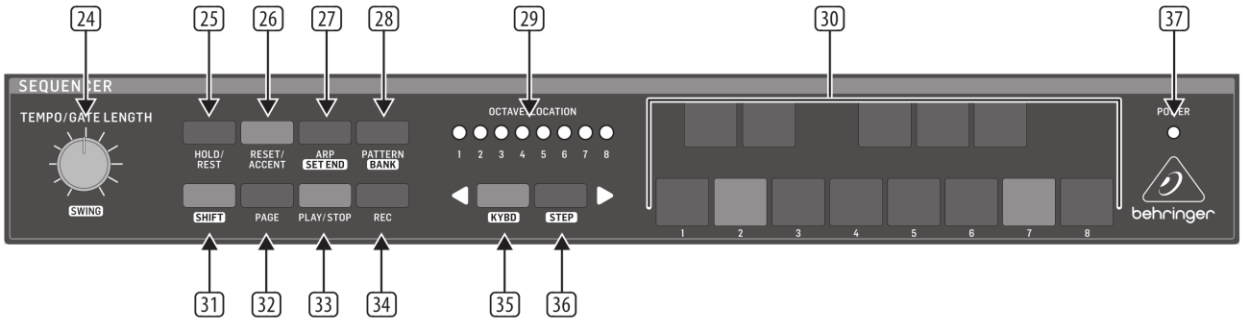
behringer

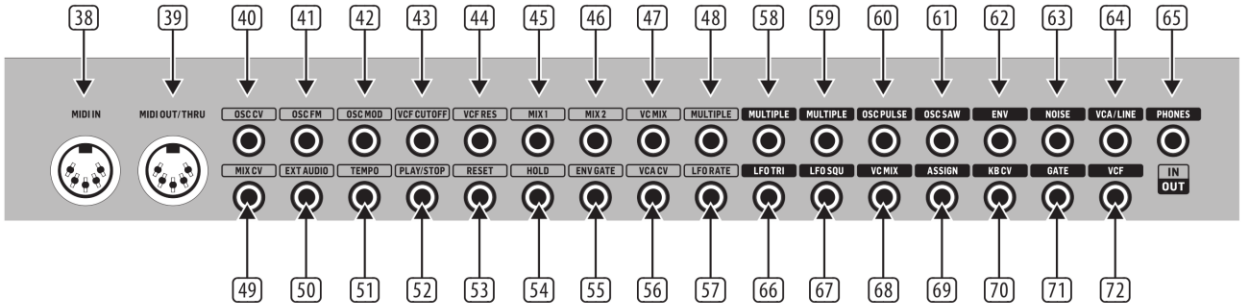
A54-00002-49720

CRAVE Controls









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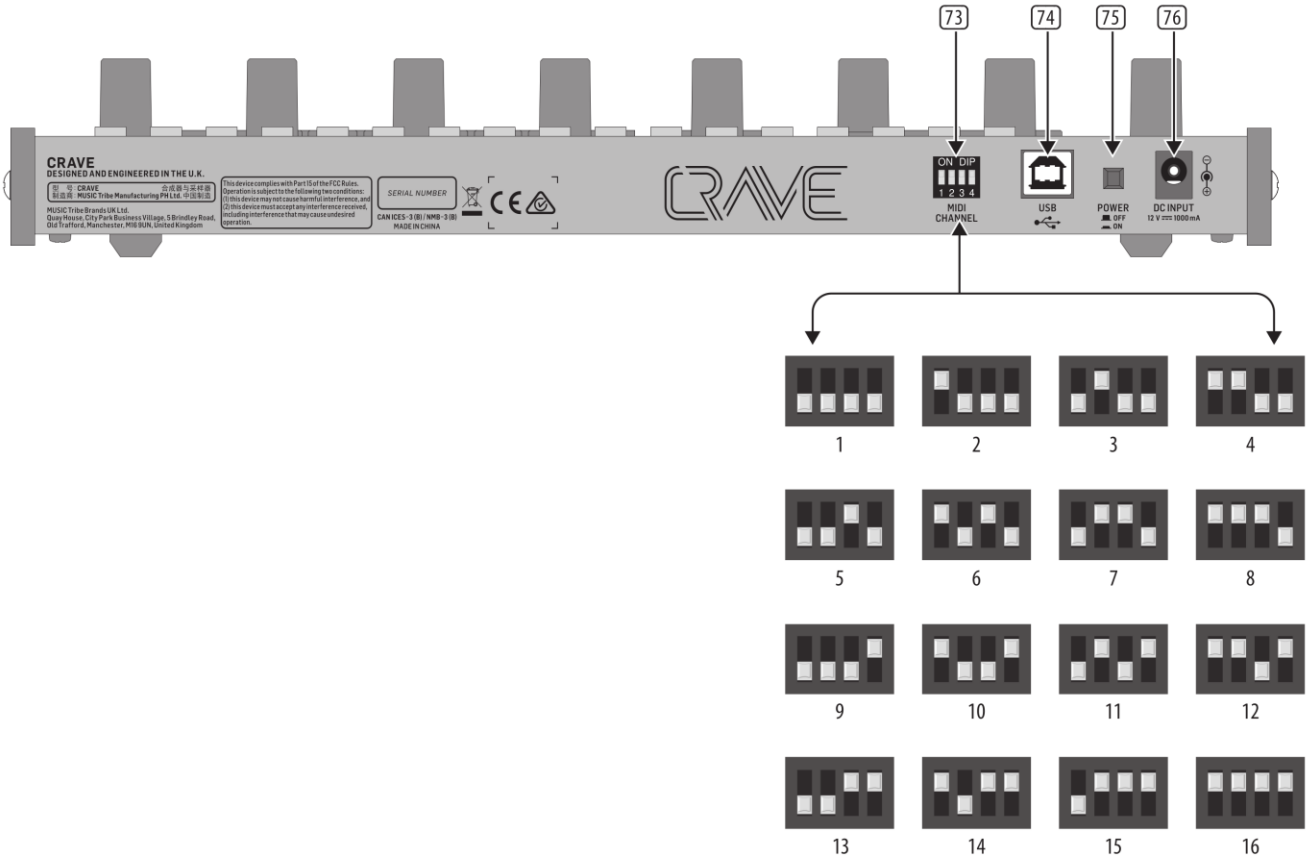
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CRAVE
DESIGNED AND ENGINEERED IN THE U.K.
SERIAL NUMBER
CAN ICES-3 (B) / NMB-3 (B)
MADE IN CHINA
ON DIP
1 2 3 4
MIDI CHANNEL
USB
POWER
OFF
ON
DC INPUT
12 V ⎓ 1000 mA
1
2
3
4
5
6
7
8
9
10
11
12
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14
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16

CRAVE Controls

EN Step 2: Controls

Oscillator (VCO) Section

1 **FREQUENCY** - adjust the frequency of the oscillator, approximately one octave either side of center.

2 **PULSE WIDTH** - adjust the pulse width of the oscillator (when in pulse mode) from narrow, to square (center position), to wide.

3 **SHAPE** - select the waveform of the oscillator from pulse or reverse sawtooth.

4 **OSC MOD** - select the depth of modulation applied to the oscillator.

5 **MOD SOURCE** - select the modulation source from the envelope (or an external modulation source), or the LFO.

6 **MIX** - adjust the mix between the VCO output and the internal noise generator. If an external audio input is used, then this is added to the mix, instead of the noise.

7 **MOD DEST** - select the modulation destination from pulse width modulation, or frequency modulation.

Filter (VCF) Section

8 **CUTOFF** - adjust the cutoff frequency of the filter.

9 **MODE** - select the VCF filter from low-pass or high-pass.

10 **RESONANCE** - adjust the amount of enhancement given to the signals at the cutoff frequency.

11 **MOD SOURCE** - select the modulation source of the VCF from the envelope generator or the LFO

12 **VCF MOD** - adjust the depth of VCF modulation.

13 **MOD POLARITY**- select the polarity of the VCF modulation.

Output (VCA) Section

14 **VOLUME** - adjust the overall synthesizer output level.

15 **VCA MODE** - select envelope, and the VCA is modulated by the envelope. In the ON position, the VCA output is the last key played, and is independent of envelope.

Envelope Section

16 **ATTACK** - control the amount of time taken to reach the maximum level after a key is pressed.

17 **DECAY** - control the amount of time taken to decay from the current level to minimum.

18 **SUSTAIN** - control the level of the envelope that is sustained after the attack time has been reached.

19 **SUSTAIN ON/OFF** - in the OFF position, the level will start to decay after the attack time is over. In the ON position, the sustain level will be held for as long as the key is held.

Modulation Section

20 **LFO RATE** - adjust the frequency of the low frequency oscillator. The LED will flash at the LFO rate.

21 **SHAPE** - select the LFO waveform from squarewave or triangular wave.

Utility Section

22 **GLIDE** - adjust the amount of Glide time (Portamento), between notes on the keyboard. (If SHIFT is held, then the knob also adjusts the "ratchet" during sequencer operation.)

23 **VC MIX** - adjust the VC MIX from LO/Mix 1 to HI/Mix 2. This control requires patch cords to operate, as it is outside of the internal sythesizer signal path.

Sequencer Section

24 **TEMPO/GATE LENGTH** - this controls the sequencer and ARP tempo when the clock source is set to internal. If USB or MIDI clock is used, it also controls the value of clock division.

During step editing, it controls the gate length. If SHIFT is held and sequencer played, then it also adjusts the swing. If SHIFT is held and ARP played, then it also adjusts the ARP gate length.

25 **HOLD/REST** - during pattern playback, this allows you to hold the current step. During step editing, it allows you to enter a rest. During ARP mode, it allows you to enter/exit ARP-Hold mode. During keyboard use, it allows you to hold the keys. (A footswitch connected to the HOLD input will also do this.)

26 **RESET/ACCENT** - during playback, this allows you to reset the pattern back to step 1. During step editing, you can add an accent to a step.

27 **ARP (SET END)** - In ARP mode, an arpeggio will play, based on the held notes using the CRAVE's 13 keyboard switches. Double-press ARP, or press HOLD and ARP, to play and hold an arpeggio. In Sequencer mode, pressing SHIFT and SET END together, followed by a STEP switch, will allow that step to become the end of the current pattern.

28 **PATTERN (BANK)** - This button is used to access either the current pattern, or bank number, as follows:

PATTERN: Press PATTERN, and one of the 8 LOCATION LEDs will show the current pattern number (from 1 to 8). To change to a different pattern number, keep the PATTERN button held down and press any of the STEP buttons (1 to 8), or press <KYBD to decrease, or STEP> to increase the pattern number.

BANK: Press SHIFT and PATTERN, and one of the 8 LOCATION LEDs will show the current bank number (from 1 to 8). To change to a different bank number, keep both SHIFT and BANK held down, and press any of the STEP buttons (1 to 8), or press <KYBD to decrease, or STEP> to hincrease the bank number.

29 **OCTAVE/LOCATION** - these multi-colored LEDS show various details, such as the Octave, PATTERN number, BANK number, current PAGE, and GATE LENGTH.

30 **KEYBOARD/STEP SWITCHES** - these multifunction switches allow you to view and select individual pattern steps, select a pattern number, select a pattern bank. They are used during recording of a pattern to show the current step. Active steps are illuminated with a steady red LED, and the current step flashes red.

The switches are laid out as a 13-note keyboard. The octave can be moved up and down by pressing the <KYBD or STEP> switches, and the row of 8 LEDs will show the current octave. The switches are used to control the sequencer editing, as well as the arpeggiator operation.

31 **SHIFT** - this is used to access the secondary features of some of the other sequencer controls, such as SET END, BANK, SWING, KYDB, and STEP. Hold down SHIFT and the other switch at the same time. For example SHIFT + PATTERN (BANK) will show the current BANK number in the LOCATOR LEDs.

32 **PAGE** - each pattern can be up to 32 steps in length. This switch allows you to show each of the 4 pages of 8 steps each. The LOCATION LEDs 1 to 4, show which page you are on. If a pattern is playing, the STEP LEDs will show the steps in use on the current page.

33 **PLAY/STOP** - starts or stops the playback of the pattern. If SHIFT is held at the same time, then this is the start of the pattern saving procedure.

34 **REC** - press this to begin the recording of a new pattern. This is also used with SHIFT during the pattern saving procedure.

35 **KYBD** - press SHIFT + KYBD to change the sequencer to keyboard mode. Press to change the 13-note keyboard octave.

36 **STEP** - press SHIFT + STEP to change the sequencer to STEP mode. Press to change the 13-note keyboard octave.

37 **POWER** - indicates that power is supplied to the unit and the rear-panel power switch is on.

MIDI Section

38 **MIDI IN** - this 5-pin DIN jack receives MIDI data from an external source. This will commonly be a MIDI keyboard, an external hardware sequencer, a computer equipped with a MIDI interface, etc.

39 **MIDI OUT/THRU** – passes through MIDI data received at the MIDI INPUT and sends MIDI data to an application.

Patchbay (3.5 mm TS connections) Input Section

40 **OSC CV** - oscillator pitch CV, at 1V/octave.
41 **OSC FM** - oscillator frequency modulation.
42 **OSC MOD** - oscillator modulation.
43 **VCF CUTOFF** - VCF cutoff frequency CV.
44 **VCF RES** - VCF Resonance CV.
45 **MIX 1** - mix 1 CV in, connected internally to VC MIX.
46 **MIX 2** - mix 2 CV in, connected internally to VC MIX.
47 **VC MIX** - VC mix control CV in, connected internally to VC MIX.
48 **MULTIPLE** - any signal entered here is passed out to both MULTIPLE outputs.
49 **MIX CV** - mix CV.
50 **EXT AUDIO** - external audio input.
51 **TEMPO** - sequencer tempo.
52 **PLAY/STOP** - sequencer play/stop.
53 **RESET** - sequencer reset.
54 **HOLD** - sequencer hold.
55 **ENV GATE** - envelope gate.
56 **VCA CV** - VCA CV.
57 **LFO RATE** - LFO frequency rate CV.

Patchbay (3.5 mm TS connections) Output Section

58 **MULTIPLE** - copy of multiple input.
59 **MULTIPLE** - another copy of multiple input.
60 **OSC PULSE** - oscillator pulse waveform output.
61 **OSC SAW** - oscillator reverse sawtooth waveform output.
62 **ENV** - envelope output.
63 **NOISE** - noise output.
64 **VCA/LINE** - connect this 3.5 mm TS output to the line-level audio input of your system. Make sure the volume is turned down and the system is turned off before making connections.
65 **PHONES** - connect your headphones to this 3.5 mm TRS output. Make sure the volume is turned down before putting on headphones.
66 **LFO TRI** - LFO triangular waveform output.
67 **LFO SQU** - LFO square waveform output.
68 **VC MIX** - VC mix output connected internally to VC MIX.
69 **ASSIGN** - assign output.
70 **KB CV** - keyboard CV output.
71 **GATE** - gate output.
72 **VCF** - VCF output.

Rear Panel

73 **MIDI CHANNEL** - these 4 switches allow you to set the MIDI Channel number from 1 to 16, as shown in the chart.

74 **USB PORT** - this USB type B jack allows connection to a computer. The CRAVE will show up as a class-compliant USB MIDI device, capable of supporting MIDI in and out.

USB MIDI IN - accepts incoming MIDI data from an application.

USB MIDI OUT - sends MIDI data to an application.

75 **POWER** - turn the synthesizer on or off. Make sure all the connections are made before turning on the unit.

76 **DC INPUT** - connect the supplied 12 V DC power adapter here. The power adapter can be plugged into an AC outlet capable of supplying from 100 V to 240 V at 50 Hz/60 Hz. Use only the power adapter supplied.

CRAVE Getting started

EN Step 3: Getting started

OVERVIEW

This 'getting started' guide will help you set up the CRAVE analog synthesizer and briefly introduce its capabilities.

CONNECTION

To connect the CRAVE to your system, please consult the connection guide earlier in this document.

SOFTWARE SETUP

The CRAVE is a USB Class Compliant MIDI device, and so no driver installation is required. The CRAVE does not require any additional drivers to work with Windows and MacOS.

HARDWARE SETUP

Make all the connections in your system. Use the rear panel MIDI switches to set the CRAVE to a unique MIDI channel in your system. Connect an external MIDI keyboard directly to the CRAVE MIDI IN 5-pin DIN type input.

Apply power to the CRAVE using the supplied power adapter only. Ensure your sound system is turned down. Turn on the CRAVE rear panel power switch.

WARM UP TIME

We recommend leaving 15 minutes or more time for the CRAVE to warm up before recording or live performance. (Longer if it has been brought in from the cold.) This will allow the precision analog circuits time to reach their normal operating temperature and tuned performance.

OSCILLATOR VCO SECTION

The CRAVE has one main voltage controlled oscillator (VCO).

The VCO waveform can be selected from pulse or reverse-sawtooth. When pulse is selected, the pulse width can be varied from narrow, squarewave (center) to wide pulse. Listen to the changes in sound that the waveforms and the change in pulse-width make. The frequency can be adjusted up or down one octave, and allow fine tuning to other instruments.

The VCO may be modulated either in pulse width, or in frequency. The source of the modulation can either be the envelope as detailed below, or the low frequency oscillator (LFO). The VCO can also be modulated using the OSC MOD input in the patch bay.

The amount or depth of VCO modulation can be adjusted using the OSC MOD control.

Use the MIX control to adjust the mix between the internal VCO (fully left)and the internal noise generator (fully right). If an external input signal is present at the EXT AUDIO input, then this will take the place of the noise in the mix.

FILTER (VCF) SECTION

Play with the cutoff frequency, and resonance controls, and listen to their effects on the sound.

The classic 24 dB/octave high pass and low pass filters allow a great deal of control over the sounds created by CRAVE.

The high-pass filter reduces the level of signals that are below the cutoff frequency. It effectively reduces the level of the fundamental, and lower order harmonics.

The low-pass filter reduces the level of signals that are above the cutoff frequency. It reduces the levels of the higher-order harmonics.

The resonance control gives an enhancement to the signals at the crossover frequency.

The amount of VCF modulation can be varied with the VCF MOD control, and also the polarity can be reversed. For example, if modulation increases the cutoff frequency, then negative polarity will decrease it.

The VCF modulation source can either be the envelope or the LFO.

All these features, in addition to using the patch bay, allows for a great deal of flexibility in sound creation.

MODULATION SECTION

The low frequency oscillator can be used to modulate the VCO and the VCF. The LFO frequency can be varied, and the waveform selected from square or triangular. An LED indicates the LFO rate.

ENVELOPE GENERATOR SECTION

The envelope generator can be used to modulate the cutoff frequency in the VCF section, and the voltage controlled amplifier (VCA). Envelope also can be used to modulate the VCO frequency and pulse width.

The controls for attack time, sustain level and decay time, allow you to adjust the envelope shape through a wide range.

PATCH BAY SECTION

This section allows you the versatility to create many different sounds, with an endless variety of options and configurations.

The VC MIX control is like having a separate mini-mixer or variable voltage source. It operates independently from the main signal path. It allows you to adjust a mix between the patchbay MIX 1 input and MIX 2 input, with possible modulation control from the VC MIX CV input. The patchbay VC MIX output can then be used to connect to other inputs in the patch bay.

If there are no MIX 1 or MIX 2 inputs connected, then the VC MIX output will vary from 0V (fully left) to +5 V (fully right). Experiment with this by connecting the VC MIX output to an input, and varying the VC MIX control.

Caution: Do not overload the 3.5 mm inputs. They can only accept the correct level of voltages as shown in the specification tables. The 3.5 mm outputs should only be connected to inputs capable of receiving the output voltages. Failure to follow these instructions may damage the CRAVE or external units.

SEQUENCER SECTION

The sequencer is described in further detail in this document. It also features an arpeggiator, and a 13-key keyboard.

OUTPUT (VCA) SECTION

Use the main volume control to adjust the sound level in your headphones or speaker system.

Keep the level down low when first putting on headphones.

Keep the CRAVE power turned off when making any connections.

Turn on the CRAVE before turning on any power amplifiers, and turn it off last. This will help prevent any turn on or turn off "pops or thumps" in your speakers.

The output can be modulated using the envelope, or it can be on continuously, playing and holding the last note played, until the next note occurs.

ARPEGGIATOR

To use the arpeggiator, press the ARP switch in the sequencer section:

1. Press it once to play the arpeggiator. (It stops when notes are released.)
2. Press it twice, or press HOLD and ARP, to hold the arpeggio. (It continues when notes are released.)

The arpeggiator rate is set by the TEMPO/GATE LENGTH knob. The arpeggiator gate length is set by SHIFT + TEMPO/ GATE LENGTH.

The order in which the arpeggiator notes are played has 8 options, and this can be changed by pressing either <KYBD or STEP> when the arpeggiator is playing. The LOCATION LED shows the current order 1 to 8:

1. UP 1
2. DOWN 1
3. DOWN and UP
4. RANDOM
5. UP (+ 1 Oct)
6. DOWN (+1 Oct)
7. UP (- 1 Oct)
8. DOWN (- 1 Oct)

ACCENT

If you are playing a MIDI keyboard, the accent is automatically triggered when the velocity exceeds the threshold. (This accent velocity threshold can be adjusted, or this feature disabled, using the SynthTool APP).

To use accent while playing, press the ACCENT switch:

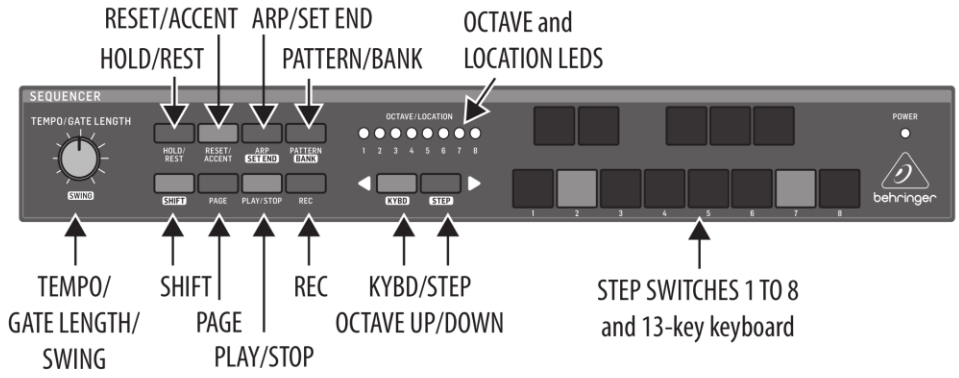
1. Press and hold to play the note with accent status. (It stops when the switch is released.)
2. Press it twice to play and hold the accent status. (The LED flashes slowly.)

FIRMWARE UPDATE

The SynthTool App is available as a free download from the CRAVE product page of our website: behringer.com. The latest file can be downloaded and stored on your computer, and then used to update the CRAVE if required.

CRAVE Sequencer operation

EN Step 4: Sequencer operation



OVERVIEW

The following details show some of the basic operation of the sequencer. You can create a short pattern of 2 or 3 steps, before trying more complex patterns. Adjust a single parameter at a time, such as gate length, ratchet, accent, glide, rest, tie, or swing, and then listen to its effect during playback.

It will help to choose a simple setting for the synthesizer, and no modulation of the VCO or VCF.

RECORDING A SIMPLE PATTERN

1. Press SHIFT and <KYBD to select the keyboard mode.
2. Initialise the current pattern by pressing SHIFT, RESET, and PATTERN at the same time. This will delete any previous steps of the current pattern.
3. Press REC, and the STEP 1 switch LED will begin flashing, indicating this is the current step about to be added and edited. (If you cannot select REC, then repeat step 1.)
4. Press any note on the CRAVE keyboard, or a rest as shown below. The <KYBD and STEP> switches can be used to change the octave. , indicated by 8 OCTAVE / LOCATION LEDs lit red.
5. To enter a rest instead of a note, press the HOLD/REST switch. When a rest is added, the LOCATOR LED 8 will light.
6. Press further notes. The next STEP switch LED will be flashing after each note or rest has been added.
7. The gate length of a step can be adjusted using the TEMPO/GATE LENGTH control. The LOCATOR LEDs will turn red, showing the gate length from 1 to 8. If set to 8, this creates a tie with the next step. If the next step is the same note, this creates a longer note, as the 2 steps are tied.
8. To create a “Ratchet,” hold SHIFT, and turn the GLIDE control. The locator LEDs will show the number of ratchets from 1 to 4, in yellow. For example, with a setting of 4, the single step is split into 4 equal parts. When a ratchet is applied, the LOCATION LED 6 will light.
9. To turn the GLIDE on for a step, turn up the GLIDE control. To turn off, turn it all the way down. When GLIDE is on for a step, the LOCATION LED 5 will light.
10. To increase the brightness or accent, press the RESET/ ACCENT switch. When an accent is applied, the LOCATION LED 7 will light.
11. Press REC when you have finished creating the pattern. It is not saved yet, but it can be played back. Caution: Do not turn off the unit, or create a new pattern, or the current unsaved pattern will be lost.

PLAYING A PATTERN

1. Press PLAY/STOP to listen to the current pattern.
2. If you decide not to save it, you can repeat the recording steps above to record a new pattern. Alternatively, press PATTERN and RESET to recall the currently saved pattern, and discard any changes.
3. If you decide to save the pattern, you must follow the “SAVING A PATTERN” procedure shown below, or it will not remain in memory if a new pattern is begun, or the power is turned off.
4. To create a SWING for this pattern, hold SHIFT and adjust the TEMPO/GATE LENGTH control. In the center position, no swing is applied, if turned down, only the off-beats will play, and if all the way up, only the on-beats will play. The SWING setting for the pattern is saved when the pattern is saved as shown below.

5. While playing a pattern, you can:

   Press HOLD/REST to hold the current step.

   Press RESET/ACCENT to return to step 1.

   Press SHIFT and any STEP, and you can edit the gate length, rest, accent, ratchet, glide but not note. Press SHIFT and the same STEP again to exit step edit. (If playback is paused, the same operation can edit the note as well.

   Press PAGE to view the pattern page from 1 to 4.
   Press SHIFT and PAGE to return to automatic page turning.

   Press SHIFT and ARP/SETEND and a STEP to change the sequence end step.

   PLAY/STOP to pause playback.

6. Press PLAY/STOP.

7. Note: To play in reverse, press SHIFT and PLAY/STOP.

SAVING A PATTERN

1. Press and hold SHIFT + PLAY/STOP for 2 seconds until the LOCATOR LED of the current pattern number begins to flash green slowly.
2. Press a STEP switch 1 to 8 to select the new desired pattern number.
3. Press PATTERN + STEP switch 1 to 8 to select the desired bank number.
4. Press SHIFT + REC to save the pattern and exit the save mode.

RECALLING A SAVED PATTERN

1. Press and hold PATTERN. The LOCATION LED will show the current pattern number. Use the <KYBD or STEP> switches to move up and down through the patterns 1 to 8, or press a STEP switch 1 to 8. You can also do this while a pattern is playing.
2. Press and hold SHIFT and PATTERN. The LOCATION LED will show the current bank number. Use the <KYBD or STEP> switches to move up and down through the banks 1 to 8, or press a STEP switch 1 to 8. You can also do this while a pattern is playing.
3. Press PLAY/STOP to play back the current pattern.
4. During playback, the LOCATION LEDs will show the current page of the pattern (1 to 4), and the STEP Switch LEDs will show the steps moving.

LIVE PERFORMANCE

During playback, temporary adjustments can be made as follows. (None of these are saved with the pattern.)

1. To add Ratchet to all steps of the pattern, press SHIFT and adjust the GLIDE control.
2. To add SWING, press SHIFT and adjust the TEMPO control.
3. To mute the pattern, press SHIFT + HOLD/REST.
4. To add an accent to all steps, press SHIFT + RESET/ACCENT.
5. Use the <KYBD and STP> switches to change the octave. The LEDs will show the current Octave in red.

EDITING A PATTERN

1. To edit a pattern in Keyboard mode, press REC. The STEP switch LEDs will light.
2. Press PAGE to select the pattern page from 1 to 4 to be edited. The green LOCATION LEDs 1 to 4 will show the current page and the PAGE button LED lit to indicate the page is locked (press SHIFT and PAGE to unlock).
3. Press SHIFT and the STEP switch you want to edit. You can enter a new note, or a rest, and adjust any of the other parameters such as ratchet, glide on/off, and so on.
4. Press SHIFT and the next STEP switch to be edited. (The steps will not automatically advance to the next step in line; you can choose which steps to edit next.)
5. Press REC to exit the editing mode.
6. Press PLAY/STOP to listen to the edited pattern.
7. Remember to save the pattern using the "SAVING A PATTERN" procedure above.

CRAVE Sequencer operation

EN Step 4: Sequencer operation

CREATING A PATTERN IN STEP MODE

1. Press SHIFT and STEP> to select the Sequencer's STEP mode. The flashing LOCATION LED will turn from green (Keyboard mode) to yellow (Step mode).
2. Initialise the current pattern by pressing SHIFT, RESET, and PATTERN at the same time. This will delete any previous steps of the current pattern. (If you want to use the current pattern instead, then do not initialise it.)
3. Press PAGE to move to a desired page of your pattern. Then press SET END and a STEP switch to choose the length of the pattern. For example, if you are on page 1 and press SET END + 8, then the pattern length is 8 steps. If you press PAGE and reach page 4, and press SET END + 8, then the pattern will be 32 steps long (4 pages of 8 steps each).
4. When the desired SET END is selected, all the STEP switch LEDs up to that step will be on solid red.
5. Press SHIFT and any one of the STEP switches at the same time. It will begin to flash, indicating it is the current step about to be edited. You can now add a note, or a rest, or any of the other functions described above in the Keyboard mode, such as Ratchet, Glide, Accent, change gate length and so on.
6. Press SHIFT and the current STEP switch to finish editing that step. It will stop flashing.
7. Repeat procedure steps 5 and 6 above, until all your required steps are good.
8. Press PLAY/STOP to play the pattern.
9. While playing, you can add temporary adjustments as shown in the "LIVE PERFORMANCE" procedure above.

SAVING A PATTERN IN STEP MODE

Save the pattern using the "SAVING A PATTERN" procedure shown above for the KEYBOARD mode.

Caution: Do not turn off the unit, or create a new pattern, or the current unsaved pattern will be lost.

CRAVE Parameters Selection

EN

EN Step 5: Parameter Selection Mode

The parameters may be changed using the following procedure:

1. Press SHIFT+ HOLD/REST + 8 to enter the setting mode. The LOCATION LED 1 will blink yellow.
2. Press <KYBD or STEP> to select pages 1 to 4. The yellow LOCATION LED shows the current page:
3. Page 1 allows you to select the tempo input mode, 1 to 5. (Please see Programming Tempo Input Modes, below)
4. Page 2 allows you to select the assign output mode, 1 to 16. (Please see Assignable Output Mode, below)
5. Page 3 allows you to select the clock type mode, 1 to 5. (Please see Clock Type Modes, below)
6. Page 4 allows you to select the clock edge mode, 1 to 2. (Please see Clock Edge Modes, below)
7. Press STEP switches 1 to 8 to select numeric values from 1 to 8. The current value is indicated by a green LOCATION LED.
8. To access values 9 to 16, press SHIFT + STEP switch 1 to 8. The current value is shown by a red LOCATION LED.
9. Note: If a setting is on the same LED number as the current page LED, then the LED will flash alternately between the yellow page color and the green or red parameter color.
10. Press SHIFT + HOLD/REST + 8 to exit the setting mode, and save any parameter changes.
11. More parameters can be changed using the Synthtool App.

Programming Tempo Input Modes:

1. 1PPS
2. 2PPQ
3. 24PPQN
4. 48PPQN
5. CV

Assignable Output Modes:

1. Sequencer Accent
2. Sequencer Clock
3. Sequencer Clock/2
4. Sequencer Clock/4
5. Sequencer Step Ramp
6. Sequencer Step Saw
7. Sequencer Step Triangle
8. Sequencer Step Random
9. Sequencer Step 1 Trigger Output
10. MIDI Velocity
11. MIDI Channel Pressure
12. MIDI Pitch Bend
13. MIDI CC1
14. MIDI CC2
15. MIDI CC4
16. MIDI CC7

Clock Type Modes:

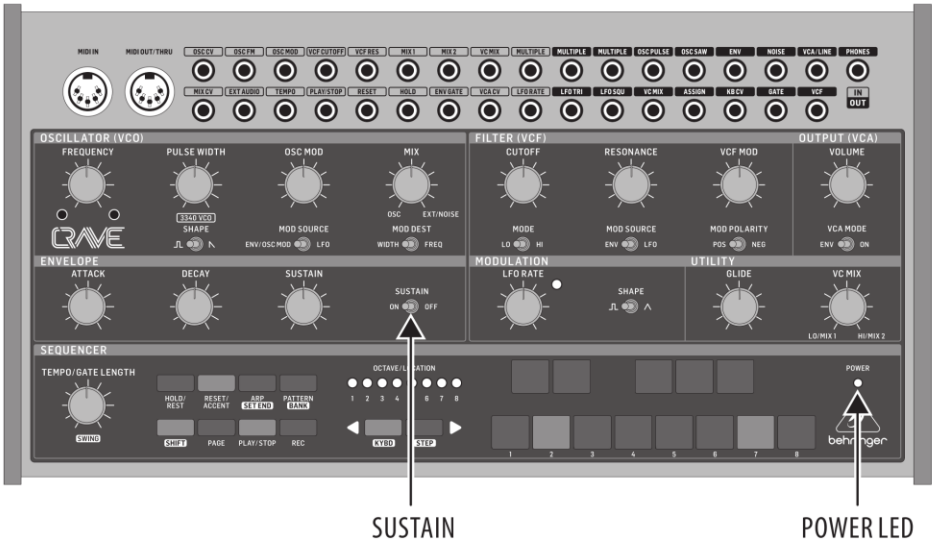
1. INTERNAL
2. MIDI DIN
3. MIDI USB
4. EXTERNAL TRIGGER
5. AUTO (clock priority: TRIG > MIDI USB > MIDI DIN > INTERNAL)

Clock Edge Modes:

1. Fall
2. Rise

CRAVE Poly Chain Function

EN Step 6: Poly Chain Function



System Mode

POWER LED	Mode
Amber	Normal Mode
Red	Poly Chain Mode

Please use the "SynthTool.exe" to configure the Poly Chain mode. The POWER LED will turn red during Poly Chain mode.

To exit Poly Chain mode without using the Synth Tool APP, quickly toggle the SUSTAIN switch more than 4 times while the SEQUENCER LEDs are flashing after power up.

CRAVE SysEx information

EN

EN Step 7: SysEx information

SYSTEM EXCLUSIVE COMMANDS

Some CRAVE parameters can be changed using MIDI system exclusive (SysEx) commands. A MIDI utility such as MIDI OX can be used to send the SysEx command data string to the CRAVE using the USB MIDI connection between the computer and the CRAVE.

MIDI SysEx Messages

The following data format is used when creating a SysEx message, and the various items in this SysEx data string are described below:

Frame start F0	Manu ID 00 20 32	Device ID aa bb cc	PKY dd	SPKT ee	Parameter D0 ... Dn-1	Frame end F7

Item (Hex)	Description
00 20 32	Manufacturer SysEX ID number (Behringer GmbH)
aa bb cc	Device ID: 00 01 05 for CRAVE
dd	It is a main packet type (abbr. PKT).
ee	It is a sub packet type (abbr. SPKT). SPKT is absent for some packets.
$D_0 \ldots D_{n-1}$	Parameter value.

Name	State	Command	Para range(D0 ... Dn)
Set Pitch Bend Range	valid	F0 00 20 32 00 01 05 11 D0 D1 F7	D0: The value of pitch bend range is 0x00~0x0C ⟶ Semitones 0~12 Default Value: 0x0C D1: Fixed value 0x00
Set MIDI Clock	valid	F0 00 20 32 00 01 05 17 D0 F7	D0: 0x00 ⟶ Disable / 0x01 ⟶ Enable Default Value: 0x00
Set Sequencer Auto Play	valid	F0 00 20 32 00 01 05 1D D0 F7	D0: 0x00 ⟶ Disable / 0x01 ⟶ Enable Default Value: 0x01
Set Assign Mode	valid	F0 00 20 32 00 01 05 1F D0 F7	D0: The value of assign mode is 0x00~0x0F ⟶ 0x00: Sequencer Accent 0x01: Sequencer Clock 0x02: Sequencer Clock/2 0x03: Sequencer Clock/4 0x04: Sequencer Step Ramp 0x05: Sequencer Step Saw 0x06: Sequencer Step Triangle 0x07: Sequencer Step Random 0x08: Sequencer Step 1 Trigger Output 0x09: MIDI Velocity 0x0A: MIDI Channel Pressure 0x0B: MIDI Pitch Bend 0x0C: MIDI CC1 0x0D: MIDI CC2 0x0E: MIDI CC4 0x0F: MIDI CC7 Default Value: 0x00

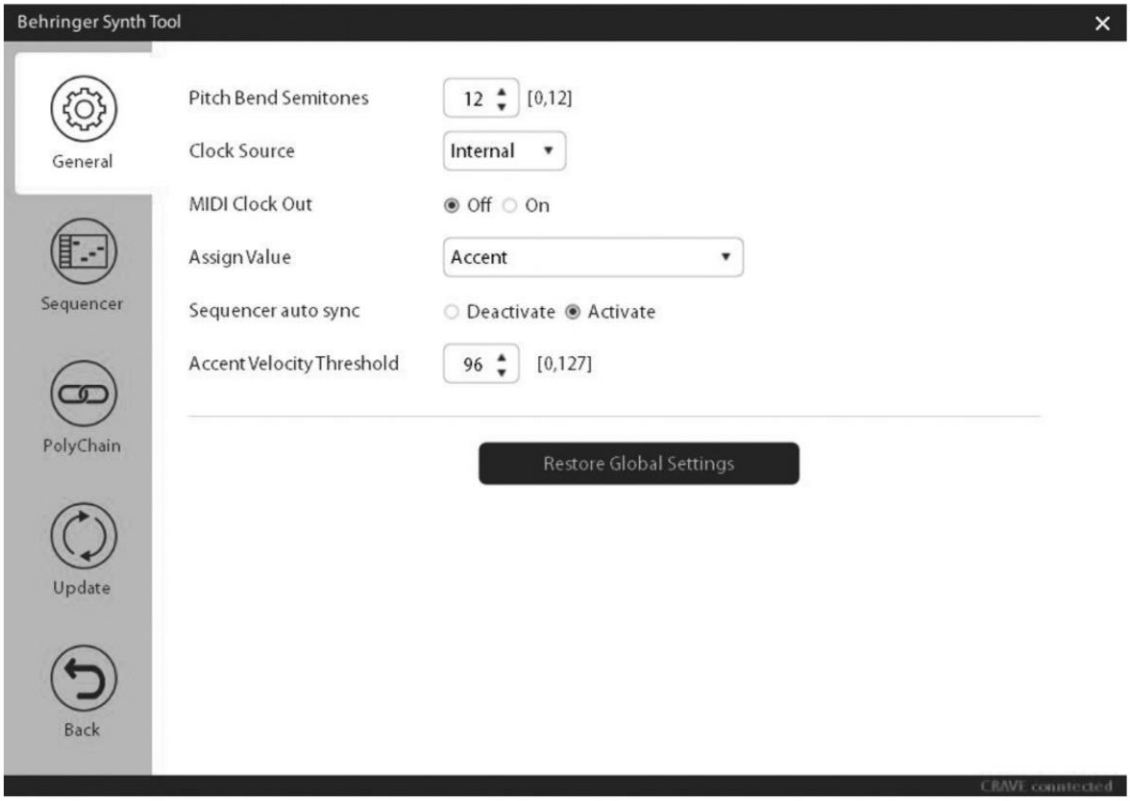
Name	State	Command	Para range(D0 … Dn)
Set Clock Source	valid	F0 00 20 32 00 01 05 1B D0 F7	D0: The value of clock source is 0x00~0x04 ⟶ 0x00: INT 0x01: MIDI 0x02: USB 0x03: EXT 0x04: AUTO Default Value: 0x00
Set Clock Type	valid	F0 00 20 32 00 01 05 1A D0 F7	D0: The value of clock type is 0x00~0x04 ⟶ 0x00: 1PPS 0x01: 2PPQ 0x02: 24PPQN 0x03: 48PPQN 0x04: CV Default Value: 0x00
Set Clock Edge	valid	F0 00 20 32 00 01 05 19 D0 F7	D0: The value of clock edge is 0x00~0x01 ⟶ 0x00: Fall 0x01: Rise Default Value: 0x00
Set Accent Threshold	valid	F0 00 20 32 00 01 05 1C D0 F7	D0: Enable value 00~7E Disable value 7F Default Value: 0x60
Get Sequencer Data	valid	F0 00 20 32 00 01 05 77 D0 D1 F7	D0: The value of bank number is 0x00~0x07 D1: The value of pattern number is 0x00~0x07
Set Sequencer Data	valid	F0 00 20 32 00 01 05 78 D0 D1 D2~Dn F7	D0: The value of bank number is 0x00~0x07 D1: The value of pattern number is 0x00~0x07 D2~Dn: Sequencer data.
Get Configurate Parameters	valid	F0 00 20 32 00 01 05 75 F7	NA
Set Configurate Parameters	valid	F0 00 20 32 00 01 05 76 D0~D8 F7	D0~D1: Pitch bend value D2: MIDI clock enable D3: Sequencer auto play enable D4: Clock source D5: Clock type D6: Clock edge D7: Assign mode D8: Accent threshold
Restore Factory Setting	valid	F0 00 20 32 00 01 05 7D F7	NA

SynthTool

EN

The SynthTool App is available as a free download from the CRAVE product page of our website.

1. Connect your host computer to the CRAVE using the USB connection.
2. Run the latest SynthTool, and the main CRAVE menu will appear, as shown in the typical general interface below.
3. Various parameters can be selected and adjusted.
4. SynthTool also has a sequencer section, a polychain section, and a system firmware update section.



Specifications

Synthesizer Architecture	
Number of voices	Monophonic
Type	Analog
Oscillators	1 (8.176 to 8.372k Hz)
LFO	1 (0.1 to 350 Hz)
VCF	1 low pass, high pass (24 dB/octave slope)
Envelopes	ADS, selectable for VCO, VCF, VCA
Connectivity	
Power input	DC input connector
Power switch	Push button on/off
MIDI In, Out/THRU	MIDI In and MIDI OUT/THRU, 5-pin DIN
MIDI channel switch	Channel selection/ 16 channels
USB (MIDI)	USB 2.0, type B
Outputs	VCA/line output: 3.5mm TS, unbalanced, max. +8 dBu
Outputs impedance	1 kΩ
Headphones	3.5 mm TRS, max.10 mW@32 Ω
Headphones output impedance	16 Ω
USB	
Type	Class compliant USB 2.0, type B
Supported Operating Systems	Windows 7 or higher Mac OS X 10.6.8 or higher
Oscillator (VCO) Section	
Type	3340
Controls	Frequency: -5 to +5 Pulse width: 5 to 95% Oscillator modulation: 0 to 10 Mix: -5 to +5
Switches	Shape: pulse, reverse saw Modulation source: env/osc mod, LFO Modulation destination: width, frequency
Filter (VCF) Section	
Controls	Cutoff frequency: 0 to 10 (20 Hz to 20 kHz) Resonance: 0 to 10 VCF modulation: 0 to 10
Switches	Filter mode: low pass, high pass Modulation source: env, LFO Modulation polarity: positive, negative
Output (VCA) Section	
Controls	Volume: 0 to 10
Switches	VCA mode: envelope, on
Envelope Section	
Controls	Attack time: 0 to 10 (2 ms to 3 s) Decay time: 0 to 10 (2 ms to 5 s) Sustain level: 0 to 10 (0 to 8 V)
Switches	Sustain: on, off

Modulation Section	
Controls	LFO rate: 0 to 10
Switches	Shape: pulse, triangular
LED	LFO rate
Utility Section	
Controls	Glide time: 0 to 10 (0 to 2 s) VC mix: lo/mix 1 to hi/mix 2
Sequencer/Arpeggiator Section	
Number of step	32 steps maximum per pattern
Number of patterns	64 patterns maximum
Memory storage	8 banks with 8 patterns each
Controls	Tempo/gate length
Switches	Hold/rest, reset/accent, arp/set end, pattern/bank, shift, page, play/stop, record, keyboard mode, step mode, 13 note keyboard
LEDs	8x octave/location
Inputs and Outputs (TS 3.5 mm)	
Inputs	OSC cv: -5 to +5 V OSC fm: -5 to +5 V OSC mod: -5 to +5 V VCF cutoff: -5 to +5 V VCF resonance: -5 to +5 V Mix 1: -5 to +5 V Mix 2: -5 to +5 V VC mix: -5 to +5 V Multiple: -5 to +5 V Mix cv: -5 to +5 V Ext audio: -5 to +5 V Tempo: -5 to +5 V Play/stop: more than 3.2 V Reset: more than 3.2 V Hold: more than 3.2 V Env gate: more than 3.2 V VCA CV: -5 to +5 V LFO rate: -5 to +5 V
Outputs	Multiple: -5 to +5 V Multiple: -5 to +5 V OSC pulse: +/-5 V OSC saw: +/-5 V Env: 0 to 8 V Noise: +/-5 V LFO triangle: +/-5 V LFO square: +/-5 V VC mix: -5 to +5 V Assign: 0/+5 V or +/-5 V KB CV: -5 to +5 V Gate: 0/+5 V VCF: +/-5 V

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Power Requirements	
External power adaptor (use only the supplied adapter)	12 VDC, 1000 mA
Power consumption	3 W maximum
Indicator	Power LED
Environmental	
Operating temperature range	5°C – 40°C (41°F – 104°F)
Physical	
Dimensions (H x W x D)	47 x 320 x 164 mm (1.85 x 12.6 x 6.46")
Weight	1.5 kg (3.3 lbs)
Shipping weight	1.97 kg (4.3 lbs)