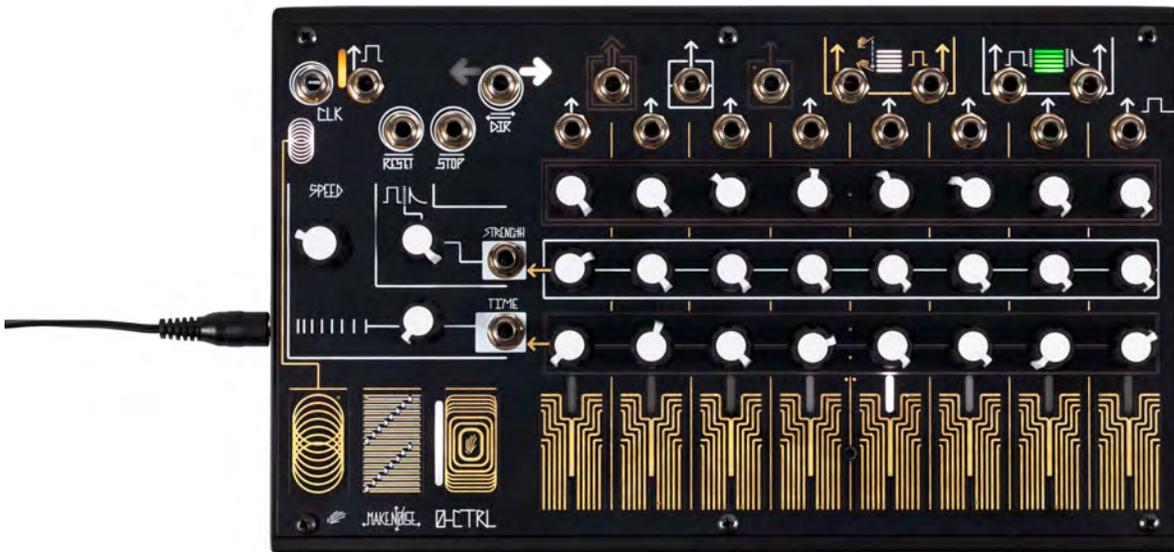


# 0-CTRL



← MAKE NOISE →

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

Changes / modifications not approved by the Make Noise Co. could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

[makenoisemusic.com](http://makenoisemusic.com)

Make Noise Co., 414 Haywood Road, Asheville, NC 28806

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## Limited WARRANTY:

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Make Noise warrants this product to be free of defects in materials or construction for a period of one year from the date of purchase (proof of purchase/invoice required).

Malfunction resulting from wrong power supply voltages, backwards or reversed eurorack bus board cable connection, abuse of the product, removing knobs, changing face plates, or any other causes determined by Make Noise to be the fault of the user are not covered by this warranty, and normal service rates will apply.

During the warranty period, any defective products will be repaired or replaced, at the option of Make Noise, on a return-to-Make Noise basis with the customer paying the transit cost to Make Noise.

Make Noise implies and accepts no responsibility for harm to person or apparatus caused through operation of this product.

Please contact [technical@makenoisemusic.com](mailto:technical@makenoisemusic.com) with any questions, Return To Manufacturer Authorization, or any needs & comments.

<http://www.makenoisemusic.com>



### About This Manual:

Written by Walker Farrell  
Illustrated by Walker Farrell and Lewis Dahm  
Spiritual Adviser: Tony Rolando

0-CTRL Hardware Design: Tony Rolando

Thanks to the Beta Testers!

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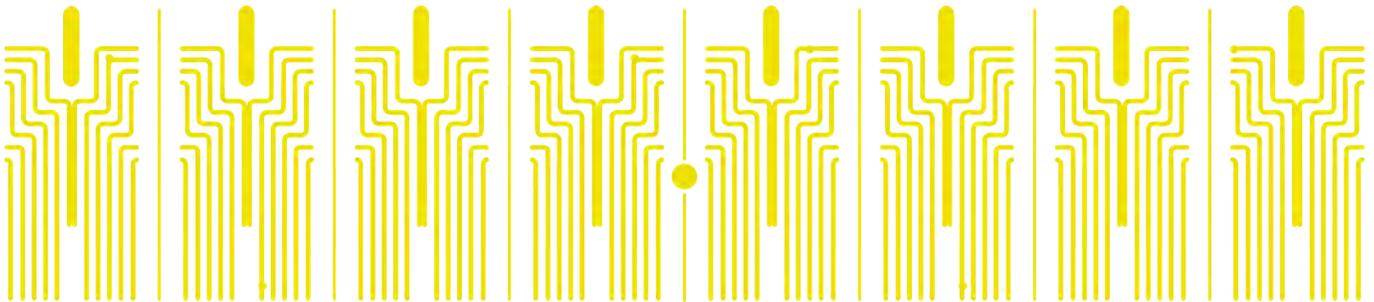
“All control systems try to make control as tight as possible, but at the same time, if they succeeded completely there would be nothing left to control.”

- William S. Burroughs

The Make Noise 0-CTRL is a patchable, clockable controller and step sequencer for voltage controlled synthesizer systems. Designed to be friends with the 0-Coast, it is a tabletop device whose inputs and outputs follow Eurorack standards, making it also a great partner for a modular system or another patchable tabletop synth.

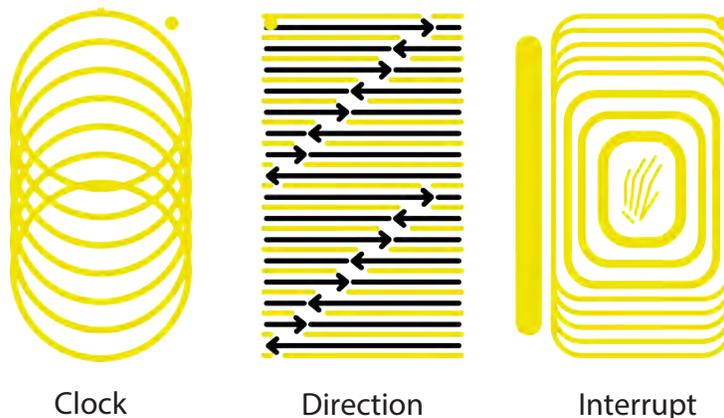
The core of the 0-CTRL is the eleven touchplates that are activated by contact with the player’s fingers.

The eight **Step touchplates** are used to manually select Steps and activate the Pressure CV and Gate outputs.



Internal or external Clock will run the sequencer through the steps. With the combination of touch and clock control, the 0-CTRL makes a highly playable step sequencer: one with Time, Gate, Envelope, and Envelope Strength controls per step. The second and third **CV Channels** control **Strength** (of the Dynamic Gate and Envelope outputs) and **Time** (between pulses of the internal Clock) for each Step of the sequence. Use the Strength and Time input attenuators to control the depth of these modulations. You may also use a different signal to control Strength or Time, by patching to the respective CV input jack and breaking the wired connection.

The three touchplates at bottom left are used for macro control of the Sequence (**Clock On/Off**, **Direction**, **Interrupt**).

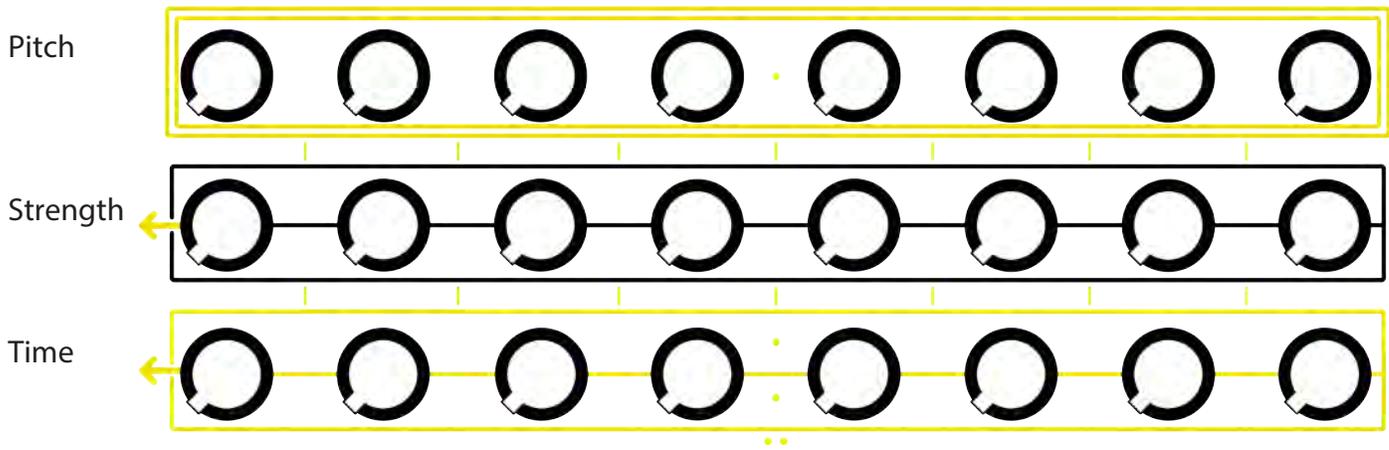
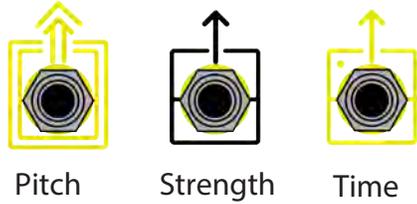


Clock

Direction

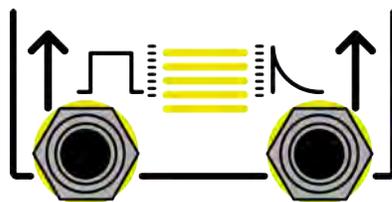
Interrupt

The **Pitch**, **Strength**, and **Time** Channels are each controlled by a row of eight knobs corresponding to the eight **Steps**. The rows of knobs are placed in boxes whose legending match those of their respective output jacks. Without any patching, the Strength and Time Channels can control the Strength and Time of the sequence per step.

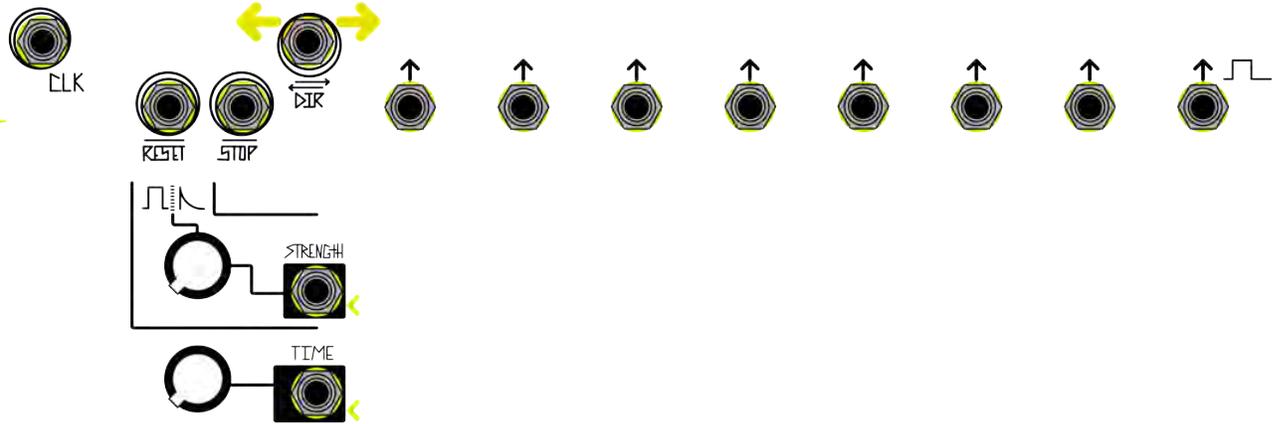


Like many classic sequencers, the 0-CTRL is a 100% analog device, and therefore has no pitch quantization on its CV outputs. They can certainly be used to control the pitch of oscillators, but there is no arbitrary limit to the precision of values they can create. Instead, the 0-CTRL encourages you to use your hands and ears to find frequencies, and your imagination to decide where to patch this control voltage.

The **Dynamic Gate** and **Dynamic Envelope** outputs can be used for note generation by patching them to envelope generators, VCAs, or filters.



There are no preset behaviors on the 0-CTRL. There are no "modes." Instead you patch program the sequence behaviors using the eight **Step Gate outputs**, along with the touch plates, and the control inputs: **Strength**, **Time**, **Clock**, **Dynamic Reset**, **Stop**, and **Direction**.

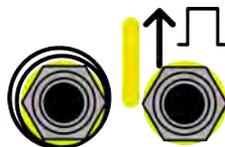


The **Interrupt Touchplate** allows you to enable or disable the Step Touchplates' ability to Interrupt the sequence.

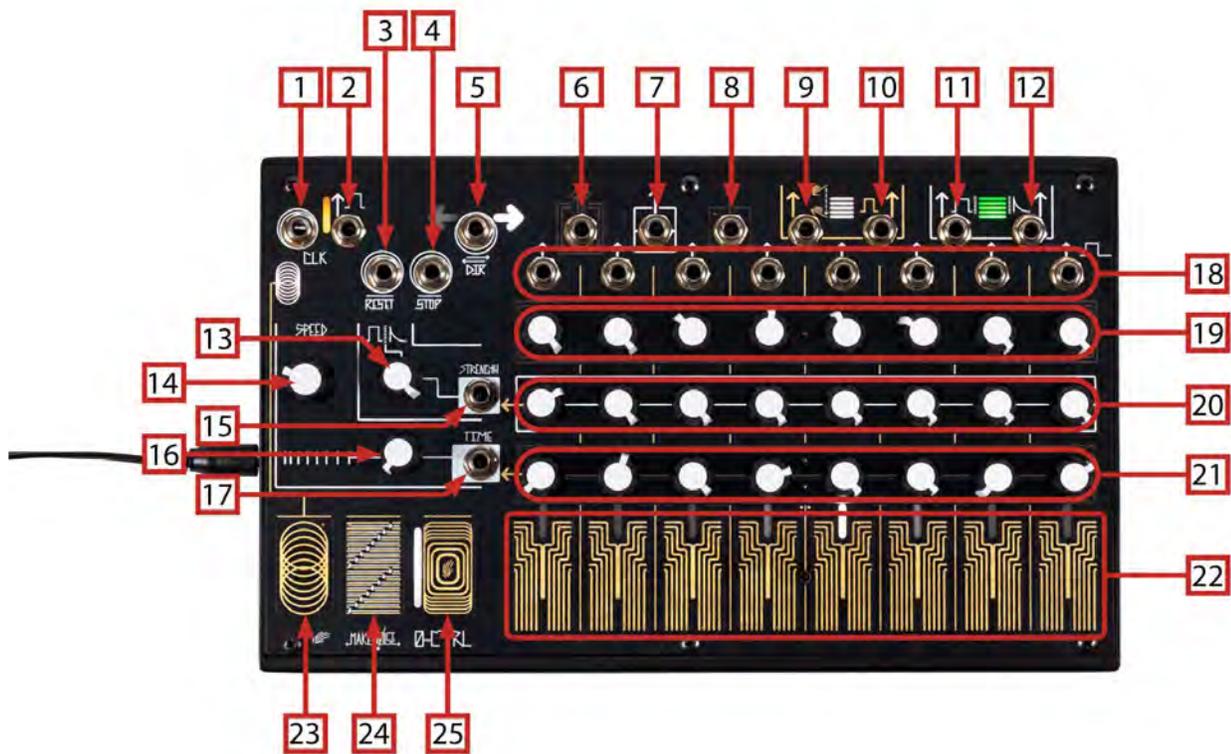


When Interrupt is ON you will be able to force the 0-CTRL to any step by touching the corresponding touchplate. When Interrupt is OFF, you will be able to generate touch CV and touch gates without interrupting the clocked sequence.

The **Clock Input** makes it easy to sync the 0-CTRL to another device. The **Clock Output** is complex: it contains both internal and external clocks, and is affected by the Time parameter.

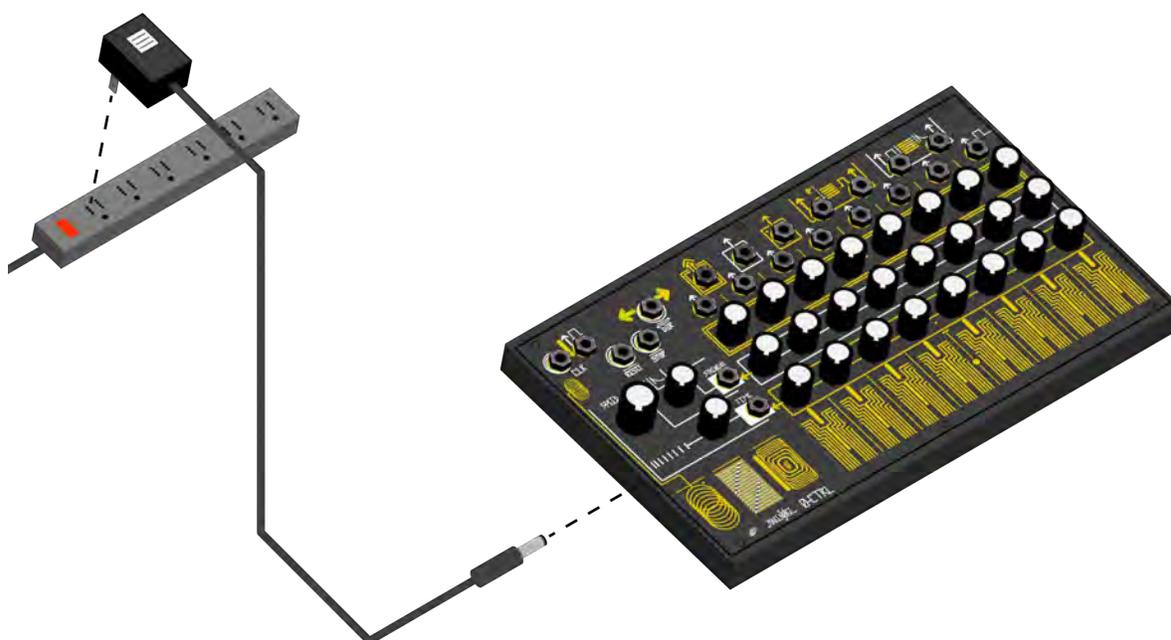


It is of course possible to use Internal and External clocks simultaneously, creating hybrid rhythms in the 0-Ctrl's sequence, and ??? at the Clock Output.



1. Clock Input. Advances sequence upon rising edge of clock, pulse or trigger signal of at least 2.0V
2. Clock Output. Output containing gates associated with Internal and/or External Clocks. 0V or 8V.
3. Dynamic Reset Input. Resets sequence to last touched Step upon rising edge of clock, pulse or trigger signal of at least 2.0V
4. Stop Input. Stops clock (internal and external) from advancing sequence for as long as input is >2.0V.
5. Direction Input. Changes/toggles sequence direction upon rising edge of clock, pulse or trigger signal of at least 2.0V.
6. Pitch Channel CV Output. Outputs CV at value of Pitch Channel knob for currently selected Step. 0-5V.
7. Strength Channel CV Output. Outputs CV at value of Strength Channel knob for currently selected Step. 0-5V.
8. Time Channel CV Output. Outputs CV at value of Time Channel knob for currently selected Step. 0-5V.
9. Pressure CV Output. Outputs CV according to amount of pressure applied to Step Touchplate(s). 0-5V.
10. Touch Gate Output. Outputs Gate signal when one or more Step Touchplate is being touched. 0V or 8V.
11. Dynamic Gate Output. Outputs Dynamic Gate Signal based on Strength and Time of current Step. 0-8V.
12. Dynamic Envelope Output. Outputs Dynamic Envelope based on Strength and Time of current Step. 0-8V.
13. Strength CV Input attenuator. Sets depth of Strength modulation from Strength Channel or signal at Strength CV Input.
14. Speed Panel Control. Sets Speed of Internal Clock and length of Dynamic Envelopes and Gates.
15. Strength CV Input. Modulates Strength of Dynamic Envelope and Gate outputs. Normalled to Strength Channel CV Output.
16. Time CV Input Attenuator. Sets depth of Time modulation from Time Channel or signal at Time CV Input.
17. Time CV Input. Modulates Clock Time. Normalled to Time Channel CV Output.
18. Step Gate Outputs. Gate outputs that go high when respective Step is active. 0V or 8V.
19. Pitch Channel Knobs. Set Pitch Channel CV Output for the eight steps.
20. Strength Channel Knobs. Set Strength Channel CV Output for the eight steps.
21. Time Channel Knobs. Set Time Channel CV Output for the eight steps.
22. Step Touchplates. Clocks Sequence to respective Step (if Interrupt ON) and generate Pressure CV and Touch Gates.
23. Clock Touchplate. Turns Internal Clock On and Off.
24. Direction Touchplate. Changes/Toggles Direction of Sequence.
25. Interrupt Touchplate. Determines whether Step Touchplates will Interrupt the Sequence when touched.

It is recommended that the 0-CTRL AC Adapter is plugged into a fuse-protected power strip with an On/Off switch; however, if that is not available, it is OK to plug it into a wall outlet. Use only the Make Noise 0-CTRL/0-Coast 15VDC Center Positive AC Adapter to power the 0-CTRL. To turn on your 0-CTRL, once you have plugged the AC Adapter into your AC outlet, attach the other end of the AC Adapter to the jack on the side of the 0-CTRL.



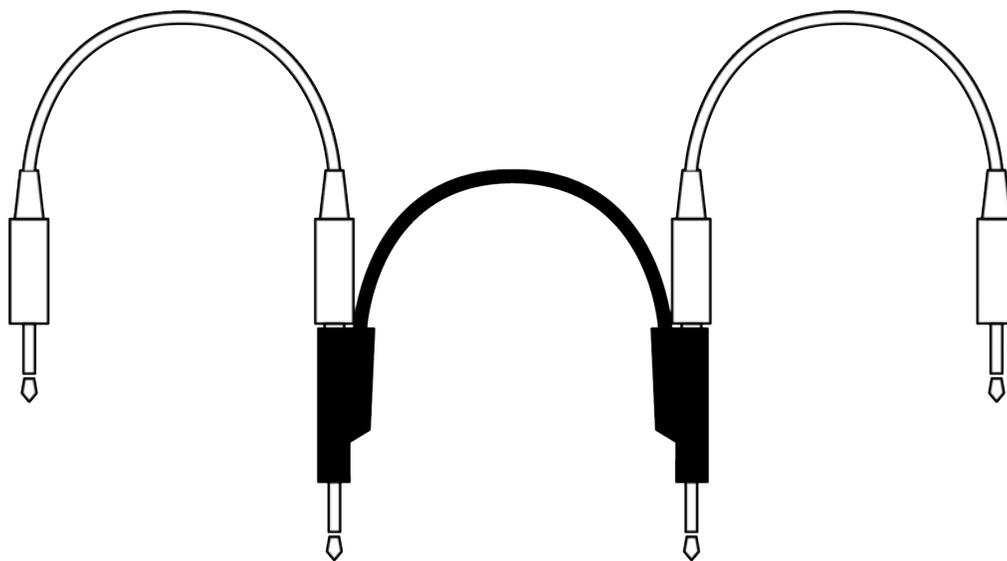
## Jacks

Every jack in the 0-CTRL is either an input or an output. Jacks are patched together with cables. Simply plug one end of the cable into an input and the other end into an output. **You must patch at least two cables between the 0-CTRL and the device to be controlled.** Patching an input to another input has no effect, and patching an output to another output has unpredictable effects and is generally not recommended. However, there are exceptions to these guidelines when using stacking patch cables (see below).

## Multing and Gate-Stacking

The 0-CTRL comes with two **stacking patch cables**. These cables have not only a plug but also a jack built in, which allows you to patch a second cable into the first and thus connect three or four jacks together.

Because the built-in jack increases the height of this cable and adds to the sideways motion of the cable in the jack, **we recommend against patching the stacking cables into each other.** Instead, patch the standard cables in. You can patch at either end (or both) of the stacking cable - both ends do the same thing regardless of where it is patched. As long as all jacks you want to connect are connected, the “order” of the chain does not matter. You may use the other end of the standard cable to connect the second stacking patch cable, if you need more than four connections in one chain.



The stacking patch cables allow you to do two things:

### 1. **Multing:** Send a single signal (CV or Gate) to multiple destinations

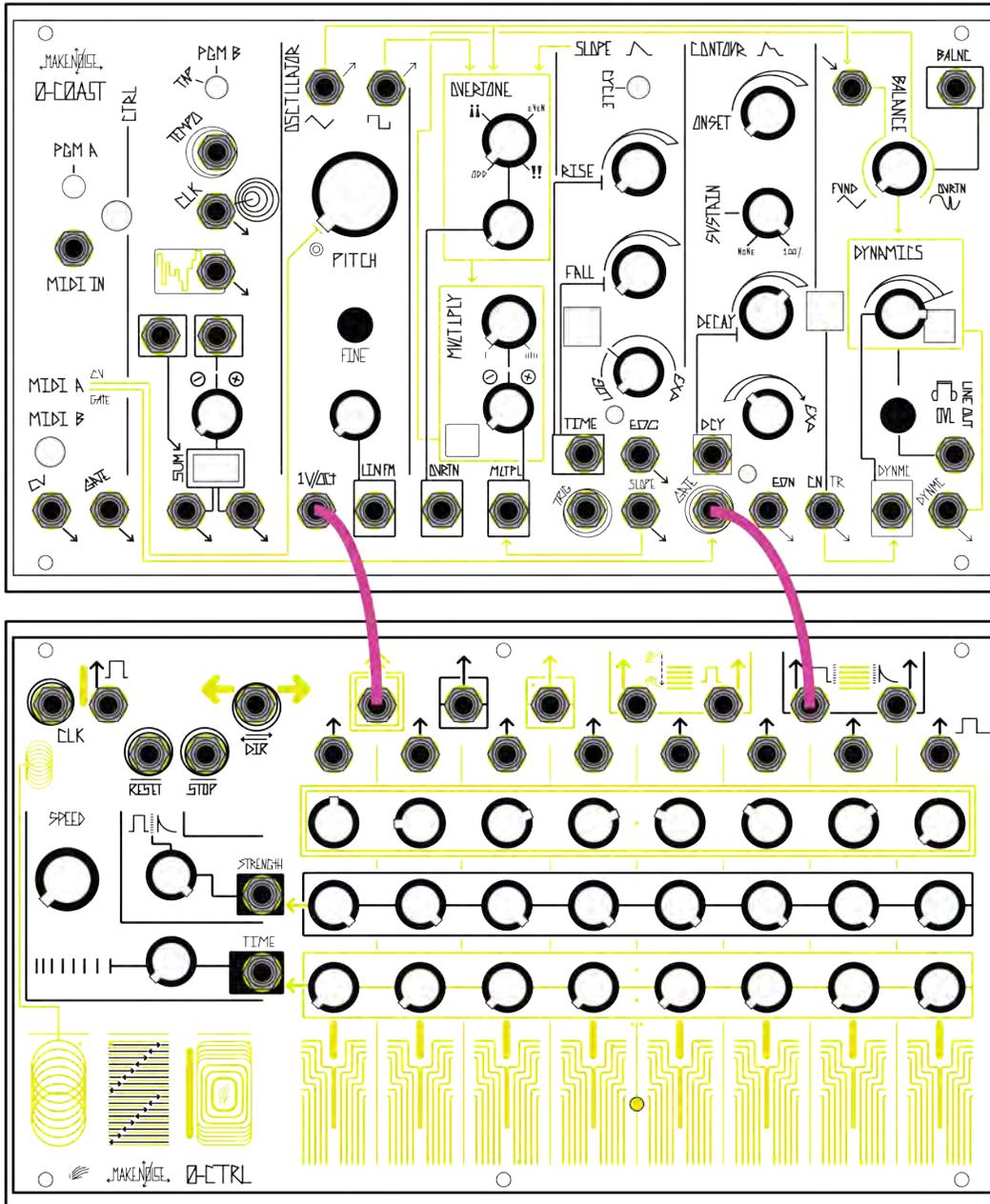
For example, if you would like to use the Pitch CV to control the pitch of two oscillators simultaneously, or the pitch of one oscillator and a timbral control such as the 0-Coast’s MULTIPLY, use the stacking patch cable to connect the Pitch CV Output to both destinations.

### 2. **Gate-Stacking:** Send multiple GATE outputs to a single destination

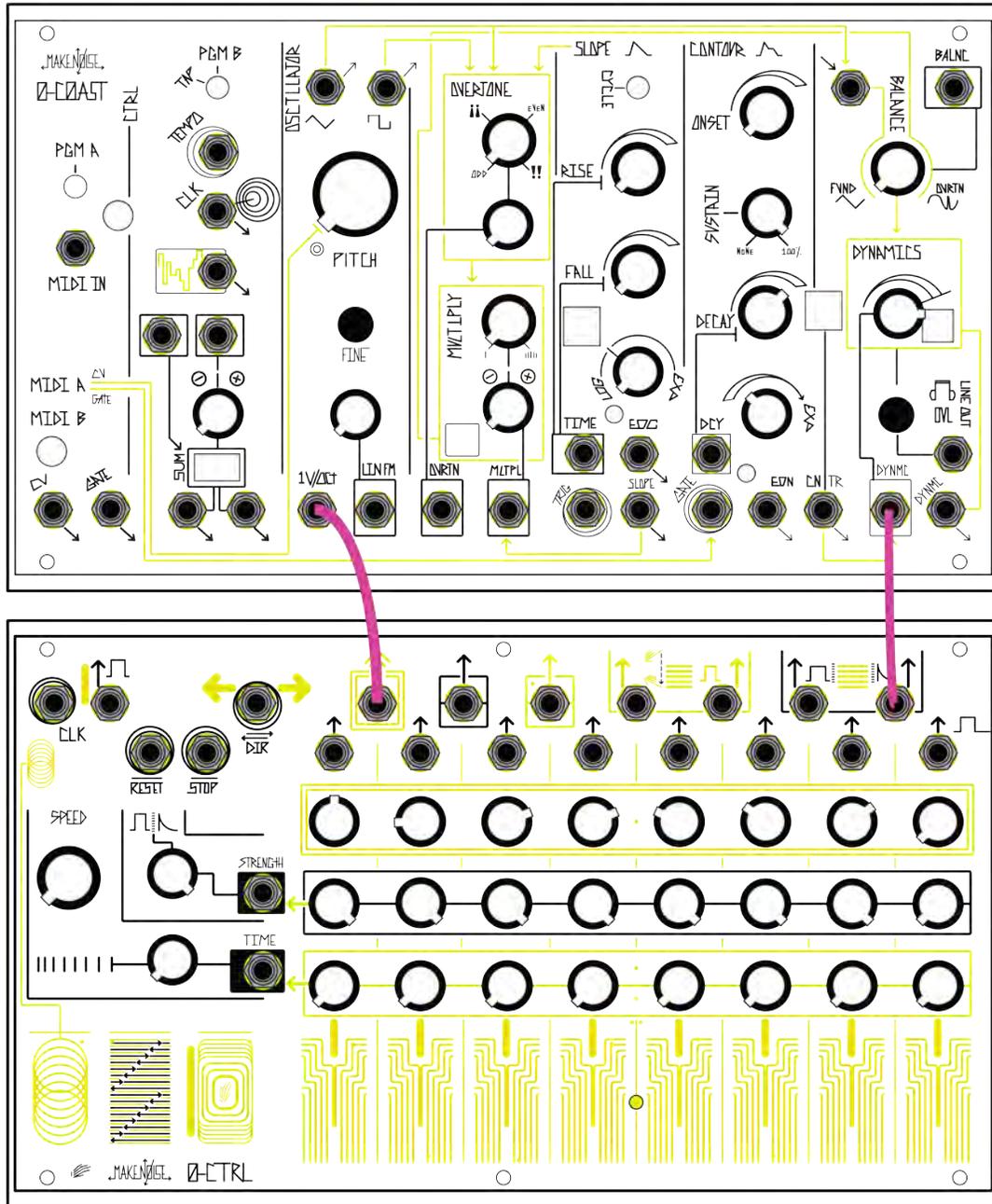
For example, if you would like to have the sequence automatically stop when it gets to step 4 or step 8, use the stacking patch cable to connect those steps’ Gate outputs to the Stop input.

The 0-CTRL (and all Make Noise) Gate outputs are designed to be combined in this way. Using stacking patch cables to combine CV (or Audio) outputs may have unexpected results.

To sequence a 0-Coast with the 0-CTRL, start the Clock by pressing the Clock button, patch the Pitch CV Output to the 1v/oct input of the 0-Coast, and patch the Dynamic Gate to the 0-Coast's Contour Gate Input. Make sure the Dynamics combo pot is turned up to 3:00 or higher, that the Strength attenuator is turned fully clockwise, and that at least some of the Strength Channel knobs are turned up. For best results set Contour Sustain to 3:00 or greater (to start). **You must always patch at least two cables between the 0-CTRL and the device to be controlled.**

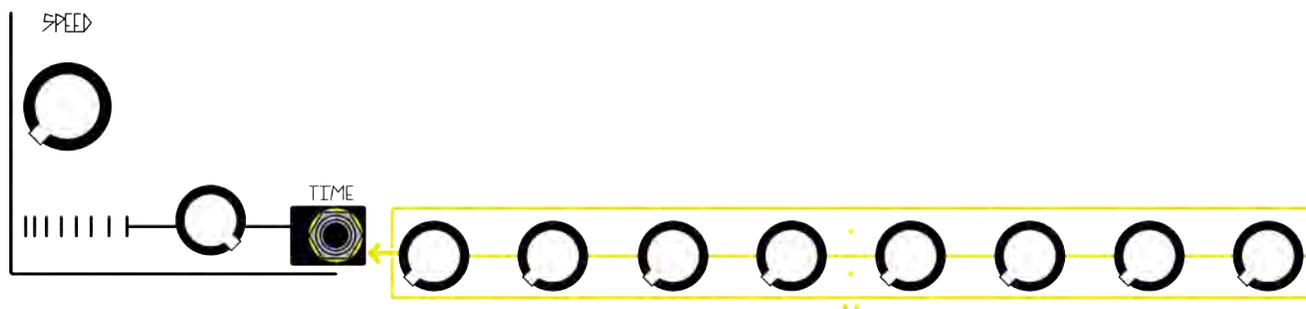


Alternatively, you can bypass the Contour circuit by patching the Dynamic Envelope to the 0-Coast's Dynamics CV Input.

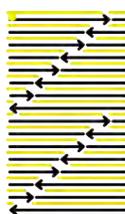


Once you have made these initial connections and settings, start the Clock using the Clock touchplate (the CLOCK Window will light white to show that the Clock is going, and the Step Indicator lights will start to "move" as they are sequenced).

You can change the Speed of the sequence with the Speed knob and the Time CV row (Time attenuator must be turned up in order to control individual step times).



You can change the Direction of the Sequence with the Direction button.



You can change the Pitch of each note with the Pitch knobs.



You can change the Strength of each note with the knobs of the Strength Channel, if you are using the Dynamic Envelope to control a VCA or 0-Coast Dynamics circuit. **Turn a knob fully counterclockwise to turn its Step's note OFF.** This allows for the creation of "rests" and dynamics within a sequence.

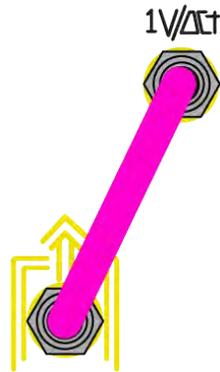
(Note: If you are using the Dynamic Gate output to control a CV/Gate synth or envelope generator, most of these will not recognize any variation in strength aside from "on" or "off." The 0-Coast Contour circuit is designed to respond to the Dynamic Gate to create notes of varying Strength.)

The Strength and Time attenuators set the amount of effect the Strength and Time Control Rows will have on these parameters. **If the attenuators are turned counterclockwise, all notes will be the same length and the Dynamic Gate and Envelope outputs will not create note events.**

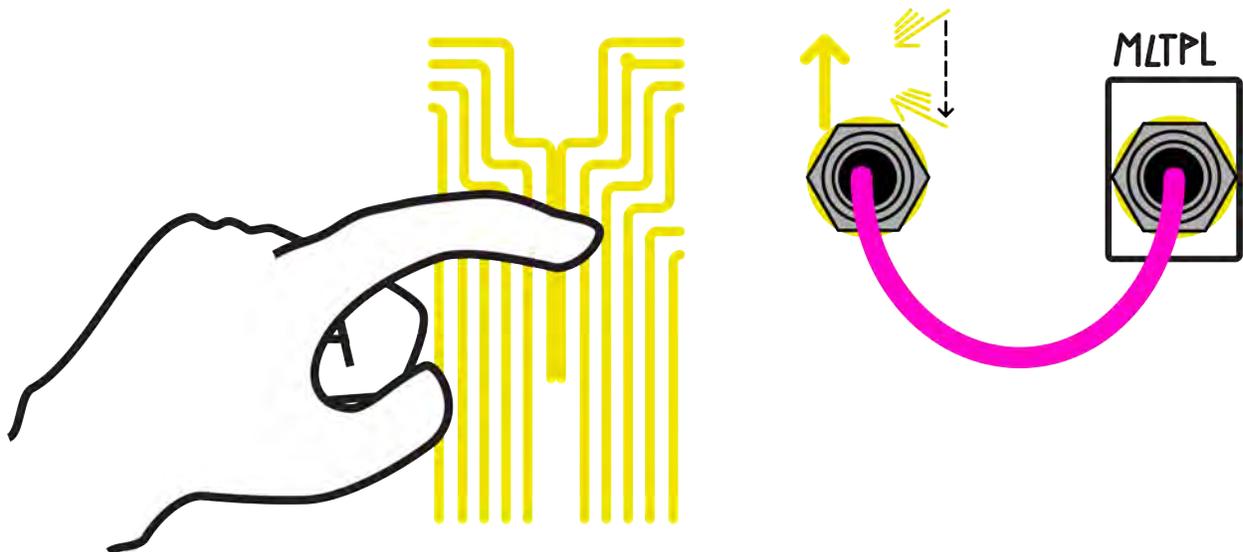




The 0-CTRL does not create sound; instead it makes **control voltage**, signals that shape and affect the sound created by whatever synthesizer you patch it to. A control voltage input typically applies the control voltage, or **CV**, to its parameter as if the voltage is an “invisible hand” turning the control. For example, increasing the level of the CV in an oscillator’s Pitch input causes the Pitch to go up. If you patch the 0-Ctrl’s Pitch Channel Output to the 0-Coast Pitch (1v/oct) input, and start the clock running, you will hear the pitch go up as the sequence reaches steps with higher values.

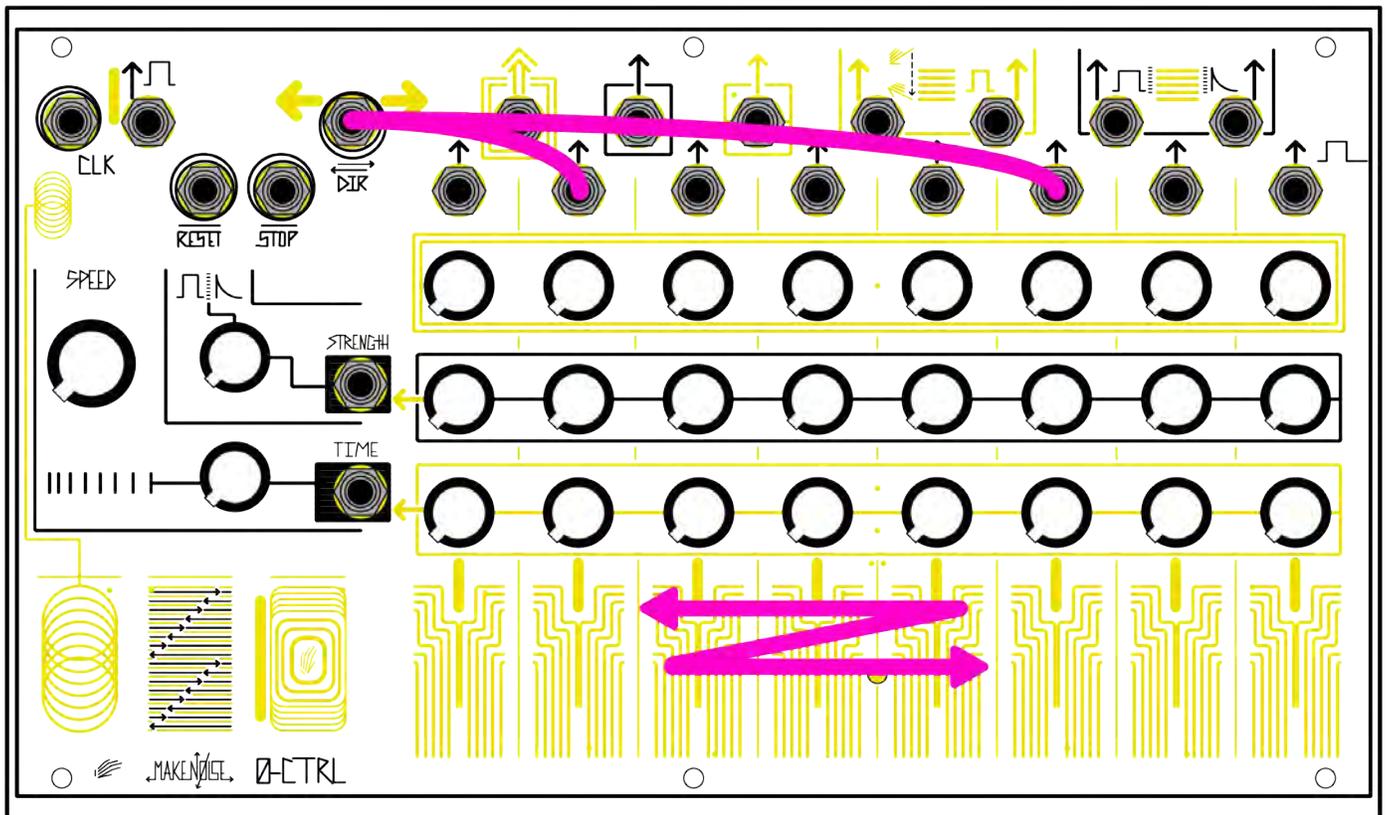


Although Control Voltage is often used to control Pitch (indeed, on many pre-MIDI non-modular synthesizers, pitch was the only thing CV could control), it can also be used to control any other parameter for which there is a CV input. For example, the Multiply circuit of the 0-Coast. If you patch the 0-Ctrl’s Pressure CV output to the Multiply CV input, you can create dramatic timbral changes in the 0-Coast waveform by pressing on a 0-CTRL touchplate.



A **Gate** is a signal whose main purpose is to initiate events or switch between states. Instead of being continuous like CV, gates have only two states, Gate High and Gate Low. "Gate High" is usually a +8V signal whose length (in time) is variable. "Gate Low" is 0V (or no signal at all).

The 0-CTRL features a large number of Gate outputs. They can be used to initiate notes, clock other sequencers, and more. In fact, the 0-CTRL also has several Gate inputs, made for patching the 0-CTRL back to itself. For example, patch any of the Step Gate outputs to the Direction input, and the 0-Ctrl's direction will switch direction every time it reaches that step. Use a stacking patch cable to patch multiple Steps to Direction, and you can make the 0-CTRL "ping pong" back and forth between two Steps of your choice.

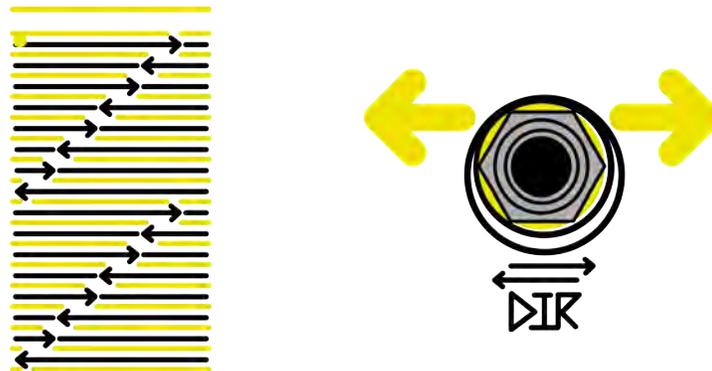


There are eleven touchplates on the 0-CTRL: three for macro control, and eight for Step selection and generating Pressure and Touch Gate signals.

The Clock touchplate starts and stops the sequencer.



The Direction touchplate changes the sequence's direction when it is touched (the DIR input does the same thing - the touchplate and input can play with or against each other as you see fit!).



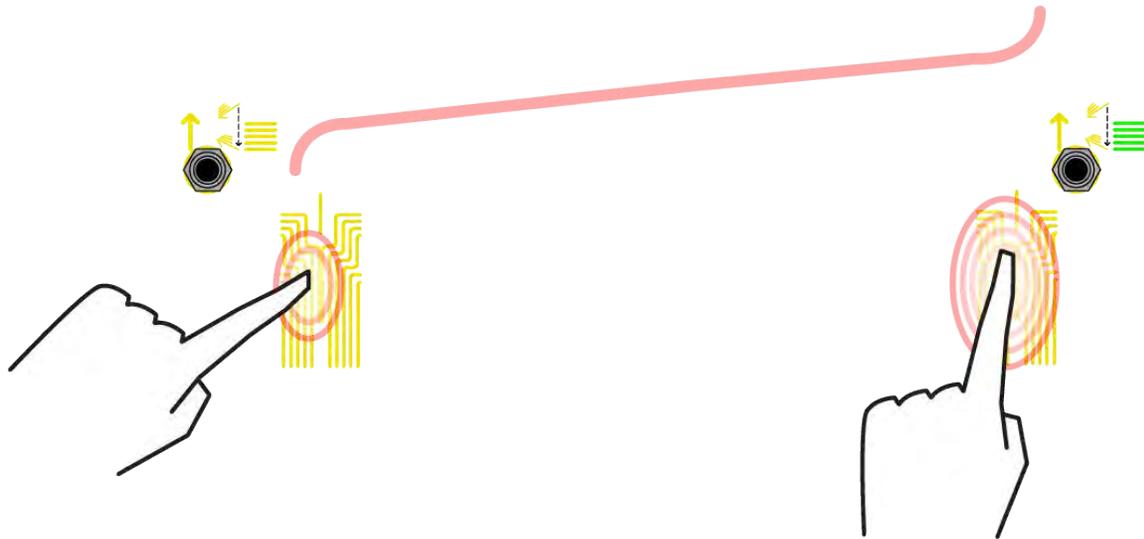
The Interrupt touchplate lights when Interrupt is On, and pressing it turns Interrupt On and Off.



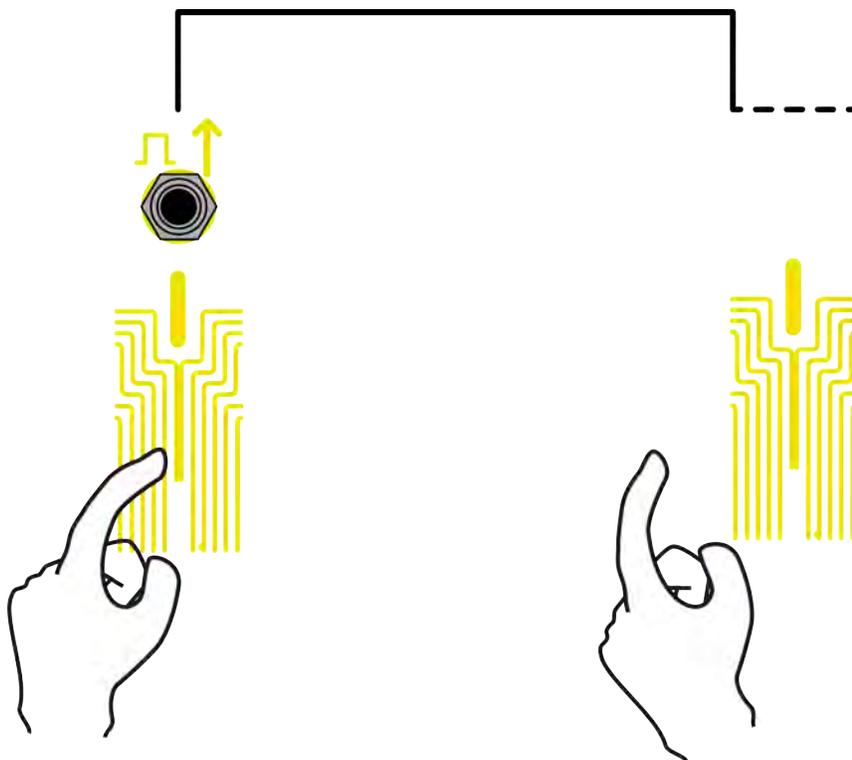
When Interrupt is On, you may select Steps by hand using the Step touchplates, thereby sequencing manually. When Interrupt is Off, touching a Step select touchplate will not cause the Step to be selected, allowing for Pressure and Touch Gate signals to be created without interrupting a sequence, Touch Gate to be patched to the Clock input for manual clocking, etc.

The eight Step touchplates, in addition to selecting the current Step of the sequence, generate signals at the Pressure CV and Touch Gate outputs, and set the Step to which the sequence will Reset.

The Pressure CV output generates a control voltage that goes higher as you press harder on the touchplate.

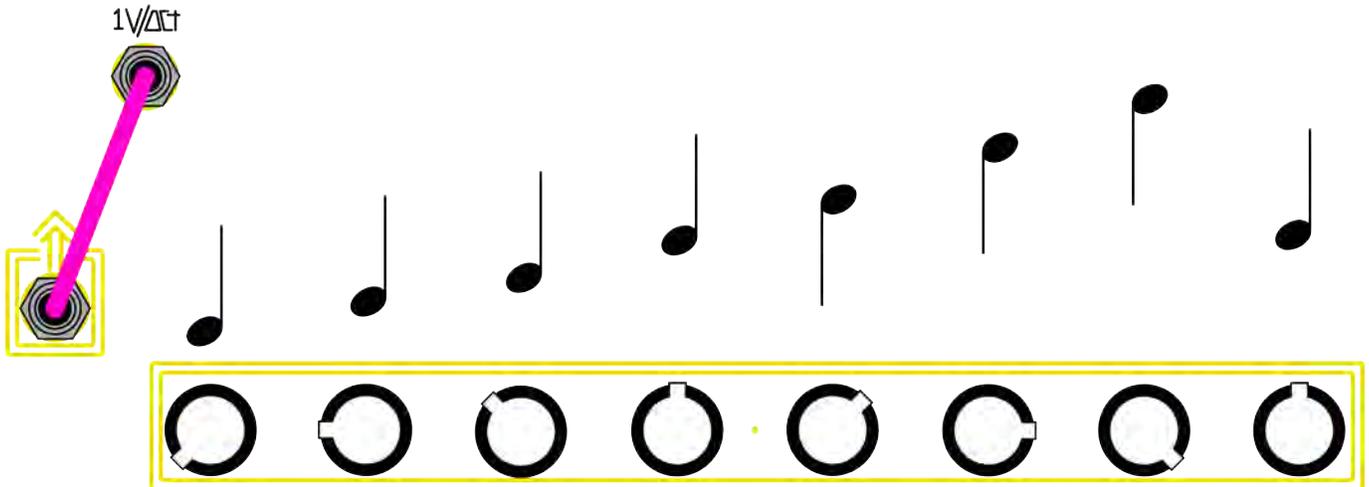


The Touch Gate output goes high whenever any touchplate is being touched, and stays high until no touchplate is being touched.



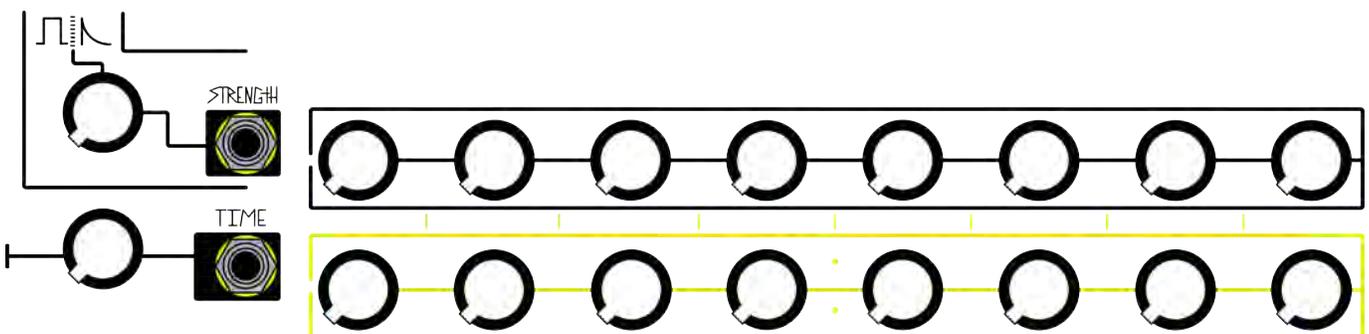
The 0-CTRL has three sequencer channels: Pitch, Strength, and Time. Each channel consists of eight knobs and an output jack. Together, Pitch, Strength, and Time represent the standard musical parameters of pitch, dynamics, and rhythm. Thus by dialing in values on the knobs of these three channels, you may create just about any musical phrase you wish to, and probably quite a few that you don't.

The Pitch Channel is typically patched to the 1v/oct or Pitch CV input on an oscillator.

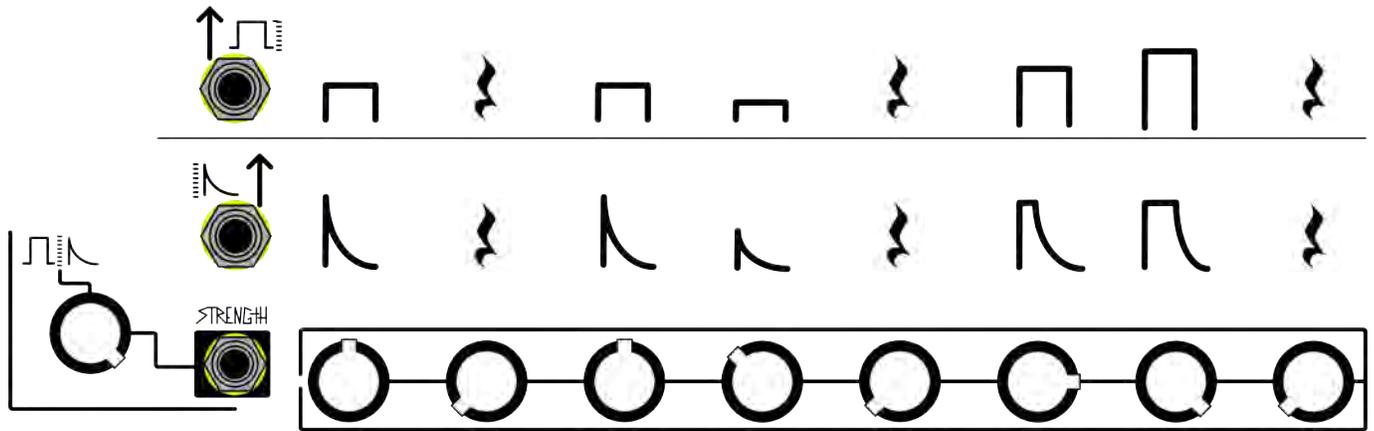


As with all the Channel outputs, the Pitch CV output can be patched to any voltage-controlled parameter, including but not limited to Pitch. Use a stacking patch cable to send it to multiple places.

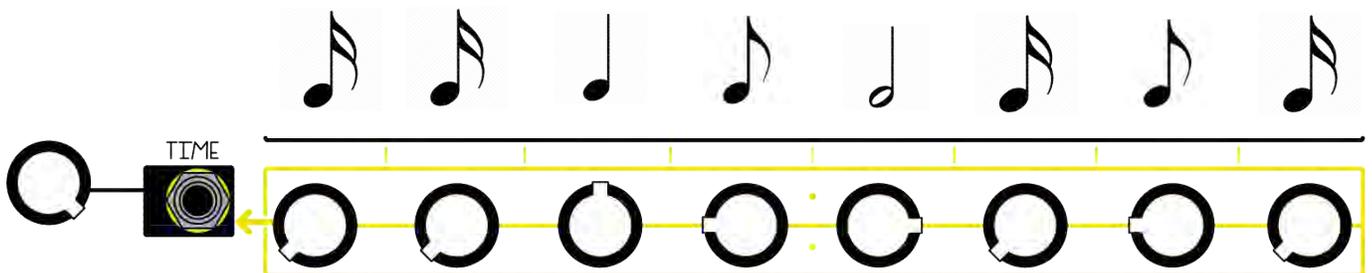
The Strength and Time Channels contain CV attenuators for the Strength and Time parameters respectively.



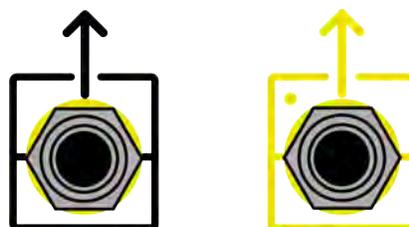
When the Strength attenuator is turned up, the Strength row will set the Strength per step of the Dynamic Gate and Envelope outputs, and thereby the dynamics/volume of the notes they are used to generate. The Dynamic Envelope starts as a two-stage Attack-Decay type that is sharp and plucky, with no sustain. Turning the Strength Channel knobs past 1:00 will introduce a third stage, creating an ASR-type envelope with variable sustain. Turn knobs counterclockwise to create "rests." (Diagram for illustration purposes, not to scale)



When the Time attenuator is turned up, the Time row will set the Clock Rate per step, and thereby the length of each note in the sequence. The resulting setting is not quantized in any way, allowing for any rhythm to be created, on or off "the grid." (Diagram for illustration purposes, not to scale)



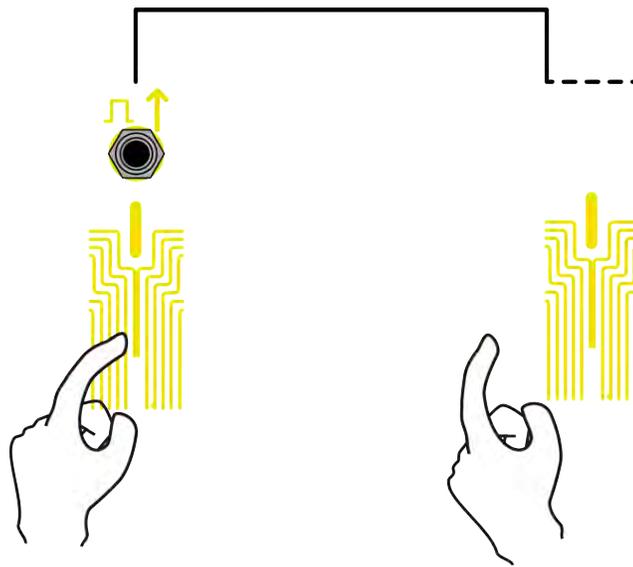
In addition to their control of Dynamics and Rhythm for the 0-Ctrl's sequencer, the Strength and Time Channels each have a sequence CV output, located next to the Pitch channel's CV output, which can be patched to any voltage-controllable parameter for sequencing of timbre, pitch of a second or third VCO, etc.



The 0-CTRL features a large number of Gate inputs and outputs. The Gate inputs are indicated on the panel by concentric circles around the jacks. You may patch gates from inside or outside the 0-CTRL to these jacks in order to program the 0-CTRL.

The Gate outputs are Touch Gate, Dynamic Gate, eight Step Gates, and the Clock Output. Any combination of Gate outputs may be "stacked" (OR-combined, to get technical) by using a stacking patch cable or multiple to send more than one of them to the same destination.

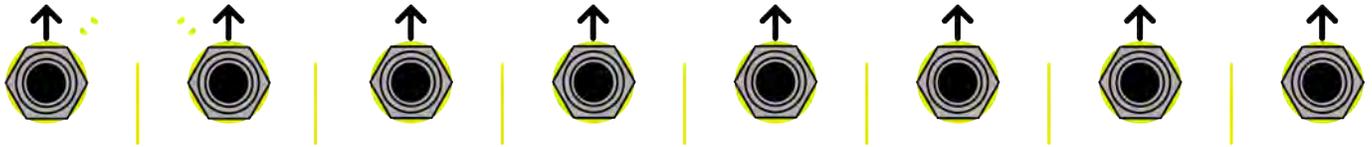
The Touch Gate goes high while any of the Step touchplates are being touched, and stays high until none of them are.



The Dynamic Gate goes high every time the 0-CTRL is clocked, and stays high for 60% of one pulse at the current clock rate. Unlike the other Gate outputs, its amplitude/"height" per Step is determined by the Strength channel. When a Step has a Strength setting of less than about 9:00 (depends upon Strength Attenuator setting) no Gate will be generated for that Step. The Dynamic Gate Output is a Gate sequencer, and allows for controlling not only if a gate is generated per step, but also the amplitude of that gate. (See diagram on p. 21.)

When the Dynamic Gate is patched to a Dynamic Gate Input such as the 0-Coast Contour Gate, the Strength channel can set the level of the resulting envelope's Sustain phase.

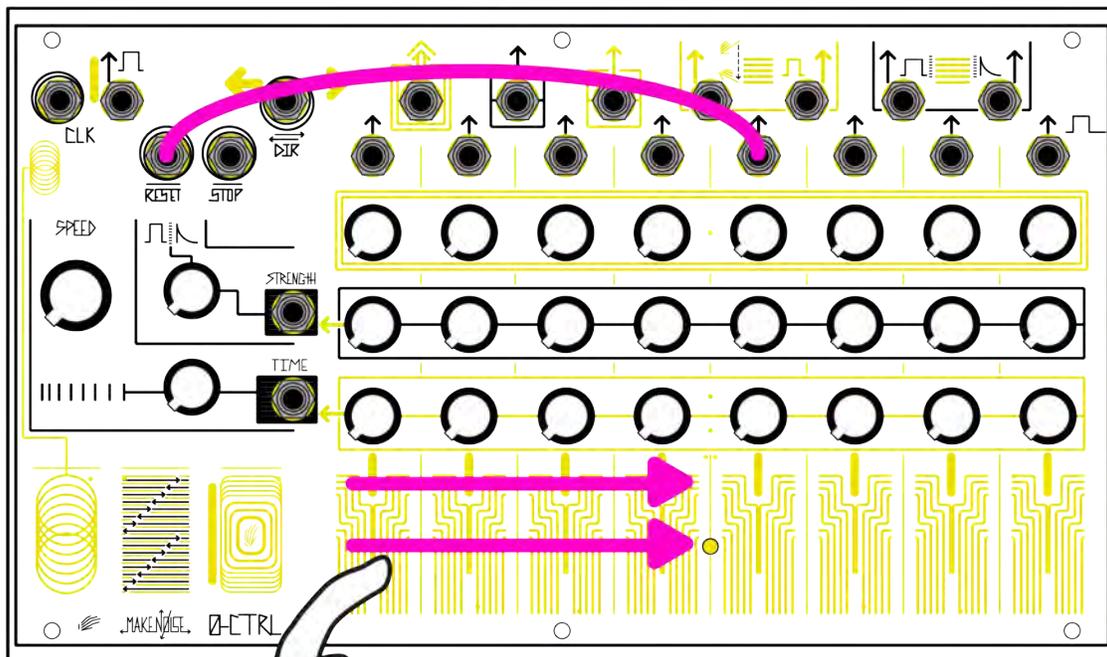
There are eight Step Gate Outputs, one for each Step. Exactly one Step Gate is high at any given time: that of the active Step. The Step Gates are useful for patching to the Gate inputs of the 0-CTRL (see below) to change sequence length and direction. A Step Gate could be patched to a gate input on a synthesizer such as 0-Coast to initiate events every time its Step is reached.



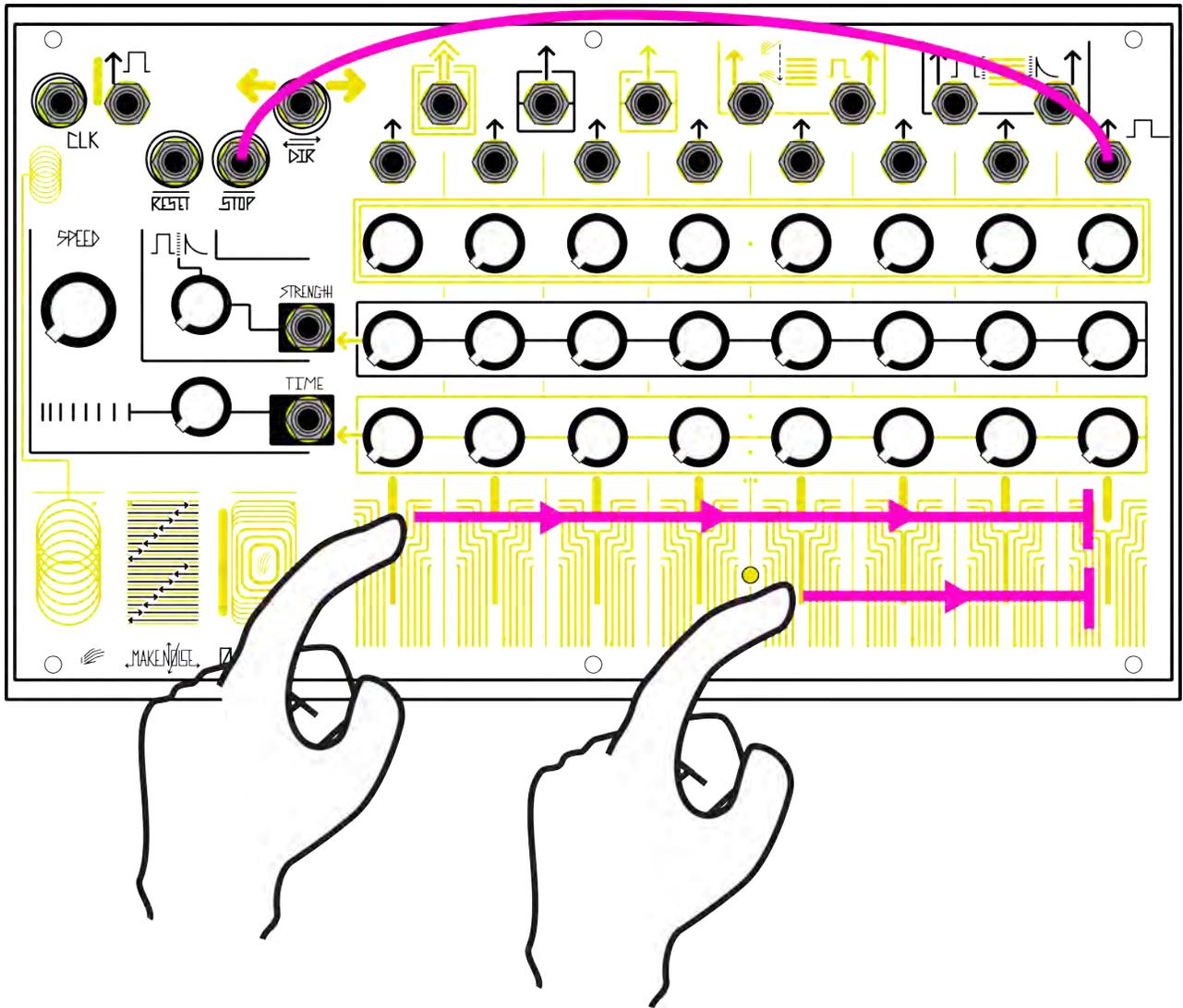
The gate inputs are **Clock**, **Dynamic Reset**, **Stop**, and **Direction**.

The **Clock** input is for patching an external clock signal to the 0-CTRL to combine with or replace the clock signal that is generated internally when the Clock is On. Any gate at the Clock input will cause the 0-CTRL to increment one Step. If Interrupt is turned Off, you could patch the Touch Gate to the Clock input to clock the sequencer by hand.

A gate to the **Dynamic Reset** input will cause the 0-CTRL to instantly move to the last Step that was touched while Interrupt was **ON**. Use this Dynamic Reset to create variable length sequences by patching a Step Gate Output to Dynamic Reset, and selecting sequence length by pressing different touchplates. It can also be used for “jumping steps.”



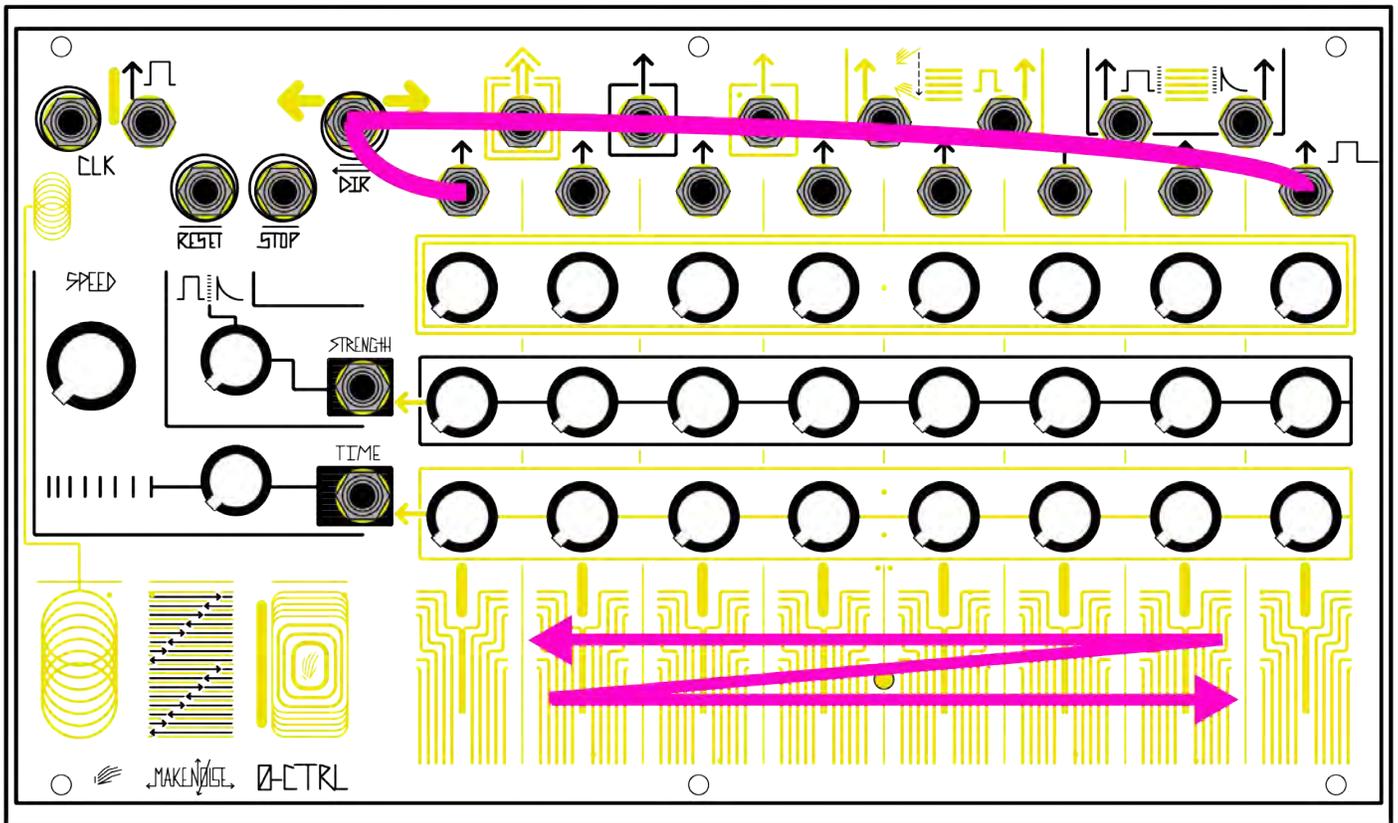
A gate to the Stop input will cause the sequence to stop until the gate goes low again.\* Patch a Step Gate Output to this input to create "one-shot" sequences. Touch a Step touchplate to "fire" a sequence, which will stop when it reaches the Step whose gate was patched to Stop.



\* Users of Pressure Points and BRAINS modules, take note that this is the inverse of the behavior of the RUN/ STOP input on the BRAINS.

The Direction input changes the sequence's direction every time it sees a new gate.\* Patch Touch Gate to Direction and turn Interrupt off to change direction by touch.

Use a stacking patch cable to patch multiple Step Gate outputs to Direction for "ping-pong" sequences, such as the so-called "Knight Rider sequence."

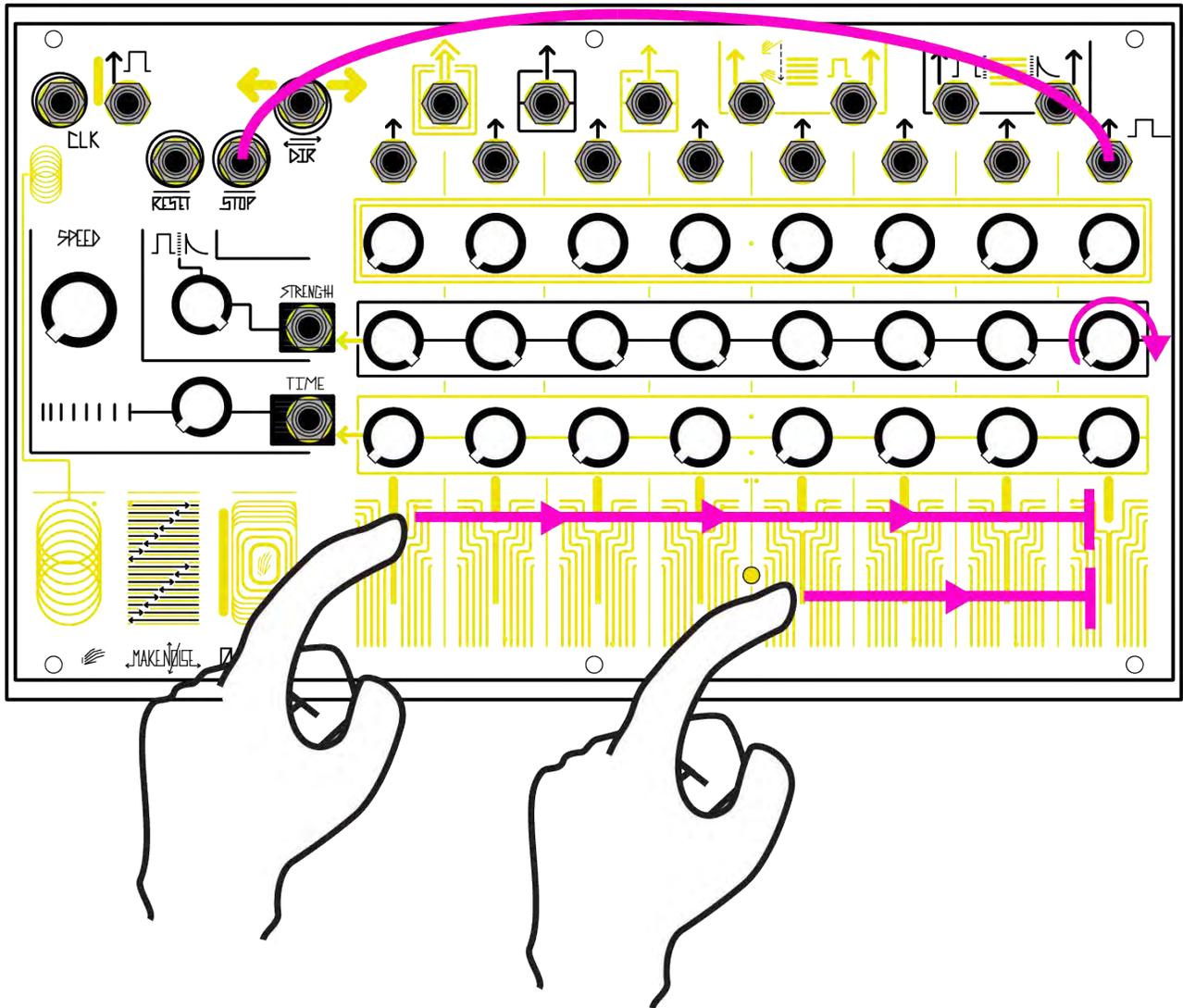


\* Users of Pressure Points and BRAINS modules, note that the 0-Ctrl's Direction input is Toggled, whereas the DIR input on the BRAINS is Momentary.

- 
- You must always patch at least two cables between the 0-CTRL and the device to be controlled.
  - If the Strength attenuator is turned down, Dynamic Envelopes and Gates will not be generated.
  - When Clocking the 0-CTRL externally, the Speed and Time controls still affect the length of the Dynamic Envelopes, Dynamic Gates, and Clock Output. Internal Speeds that are faster than the external Clock will result in short pulses, **while those that are slower will result in "ties."**
  - Use Pressure and Touch Gate outputs without interrupting a sequence by turning Interrupt Off.
  - Strength and Time may be controlled by CV sources other than the Strength and Time Channels, by patching your preferred CV into the CV input jacks.
  - If patching the Dynamic Gate output to a gate or clock input that does not recognize variable gate height (at the time of the 0-Ctrl's release, this means almost any gate input aside from the 0-Coast Contour circuit), then the response will be the same for any Strength control above 10:00 or so. In this case, if you are not also using the Strength CV output to control something else, consider just turning the steps on which you want gates generated up all the way, and those on which you do not want gates generated, down all the way.
  - The 0-CTRL will continue to generate Dynamic Envelopes and Gates as long as a clock is present, even if the sequence is stopped (either by hand or by the Stop input). This behavior can be used dynamically to create "ratcheting" effects.
  - The Reset, Stop, and Direction inputs will also respond to the Channel CV outputs once their knobs go above a certain level. For example you can patch a channel CV output to one of these inputs and adjust the knobs during performance for dynamic evolution of Resetting, Stopping and Direction changing.
  - Because one Step Gate is always high, you can patch adjacent Step Gates together with stacking patch cables to create combined gates that are multiple steps long (ties).
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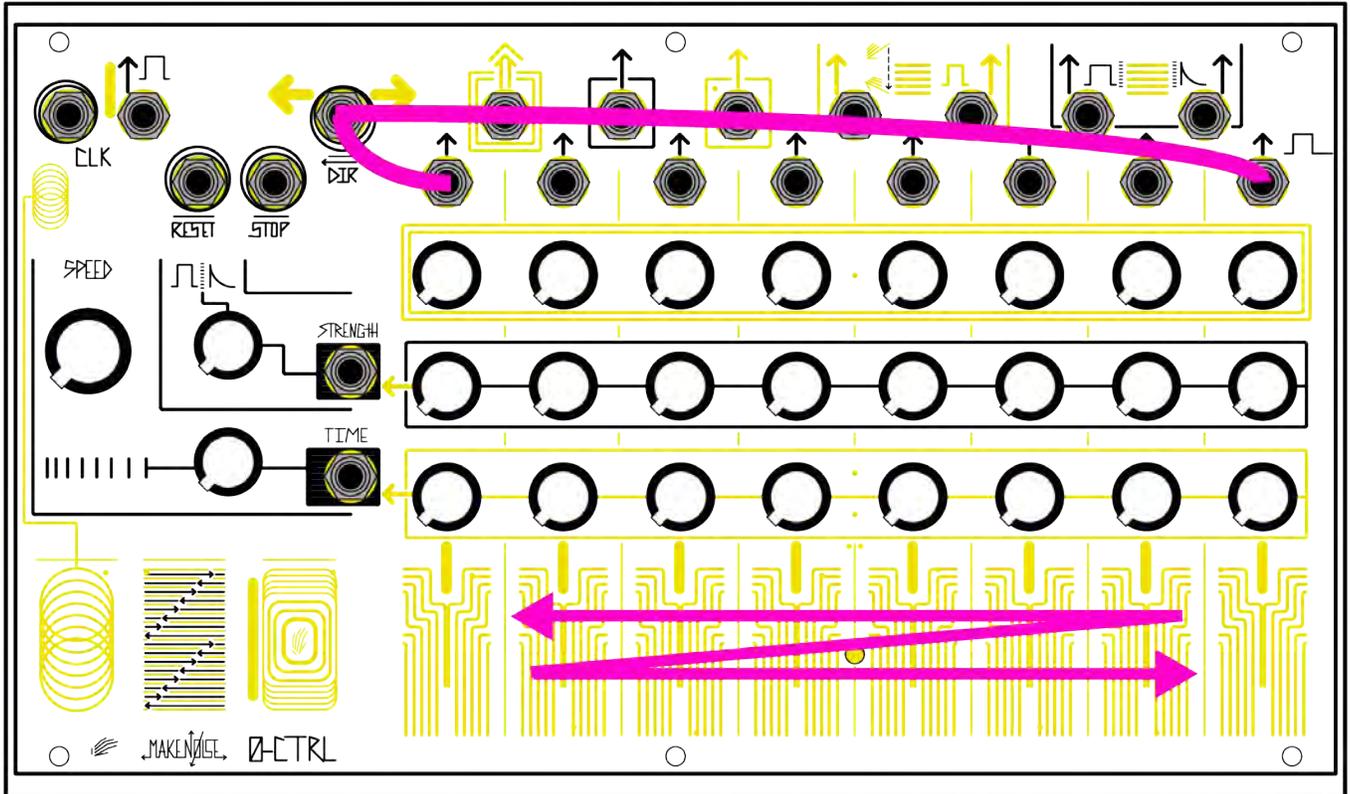
### By Pressing Down A Special Key It Plays A Little Melody

Patch Step 8 Gate to Stop Input. Touch any stage other than 8 to run the sequence, which will stop at Step 8. If you are using the Dynamic Envelope or Gate, you can either turn Step 8 on the Strength row down to make the sequence go silent at the end, or turn it up to let the final note continue to re-trigger at the current Speed.



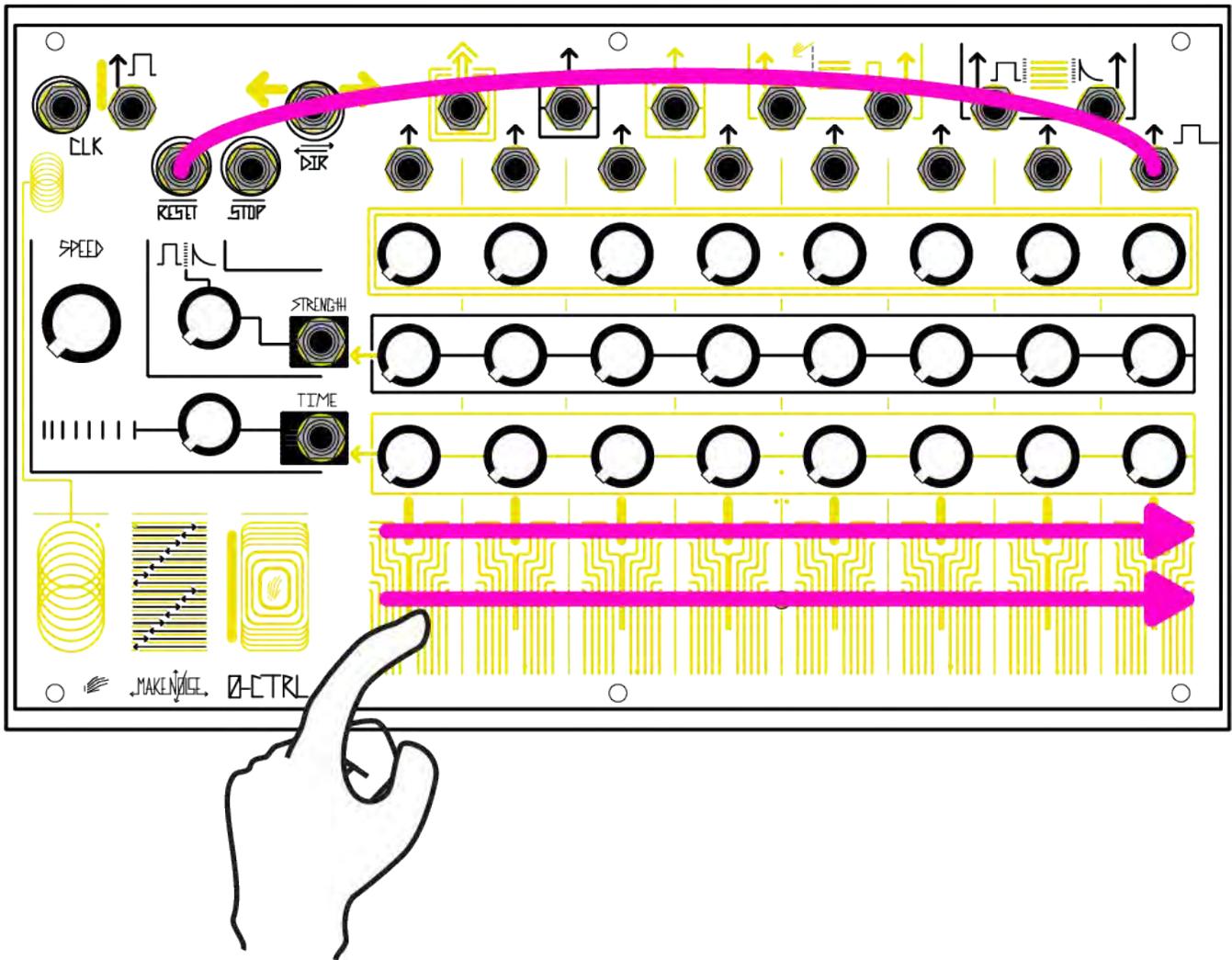
### Super Pursuit Mode

With sequence running, use a stacking patch cable to patch Step Gates 1 and 8 both to Direction input. Sequence will travel back and forth across the grill.



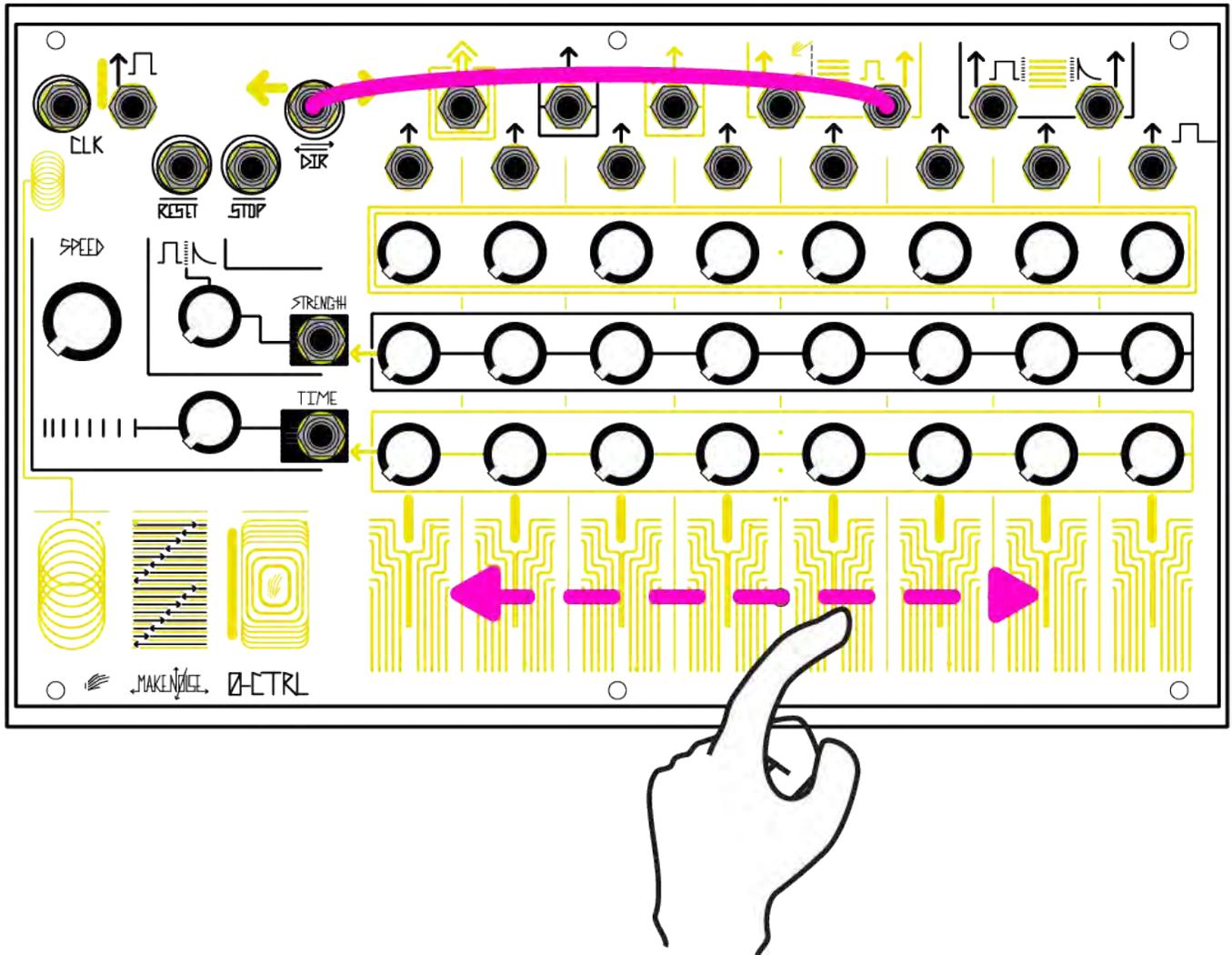
### Touch-Controlled Pattern Length

With sequence running, patch Step 8 (or any Step) Gate to Reset Input. Touch the plate of the stage that is to be the start of the sequence. The sequence now runs to Step 8 and returns to last touched stage, effectively giving you touch control of sequence length.



### Touch-Controlled Direction

Turn Interrupt Off and patch Touch Gate to Direction. The sequence will change direction each time you press a Step touchplate.



### **Touch-Controlled Sprocket Wrench**

Set Pitch, Strength, and Time channel knobs to taste, and turn 0-CTRL Clock ON. Press and hold individual Step touchplates to interrupt the sequence with repeating notes with pitch, strength, and length set by the three channels' knobs.

### **Touch-Generated Envelopes**

Turn Clock OFF and patch Touch Gate Output to Clock Input. Set Strength and Time rows to taste. Each press of a Step touchplate will generate a Dynamic Gate and Envelope whose strength and length are determined by the Strength and Time settings for that Step. (Thanx Sam Turner)

### **Expressive Envelope Offsets**

Patch a stacking cable from the Dynamic Envelope to the Pressure output. Patch a cable from the Pressure output (via the stacking cable) to your modulation destination of choice. Switch Interrupt off. Begin sequencing the 0-CTRL — the Dynamic Envelope will provide repeatable transient control voltage in time with the sequence. To add an expressive offset to these envelopes, press a pad. (Thanx Peter Speer)

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