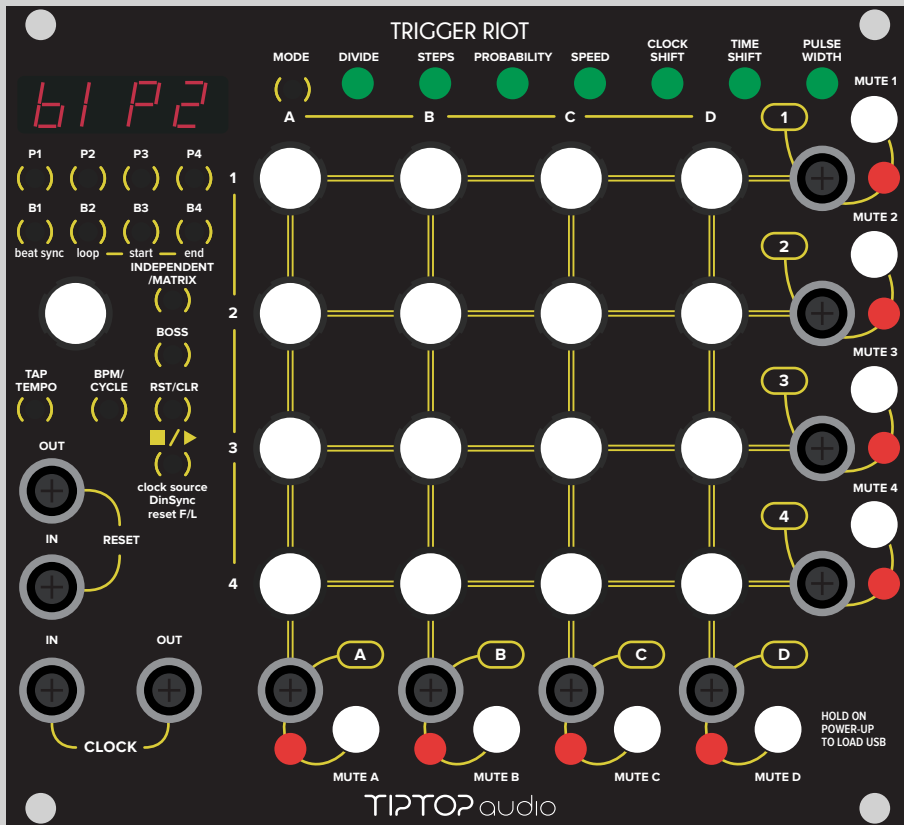
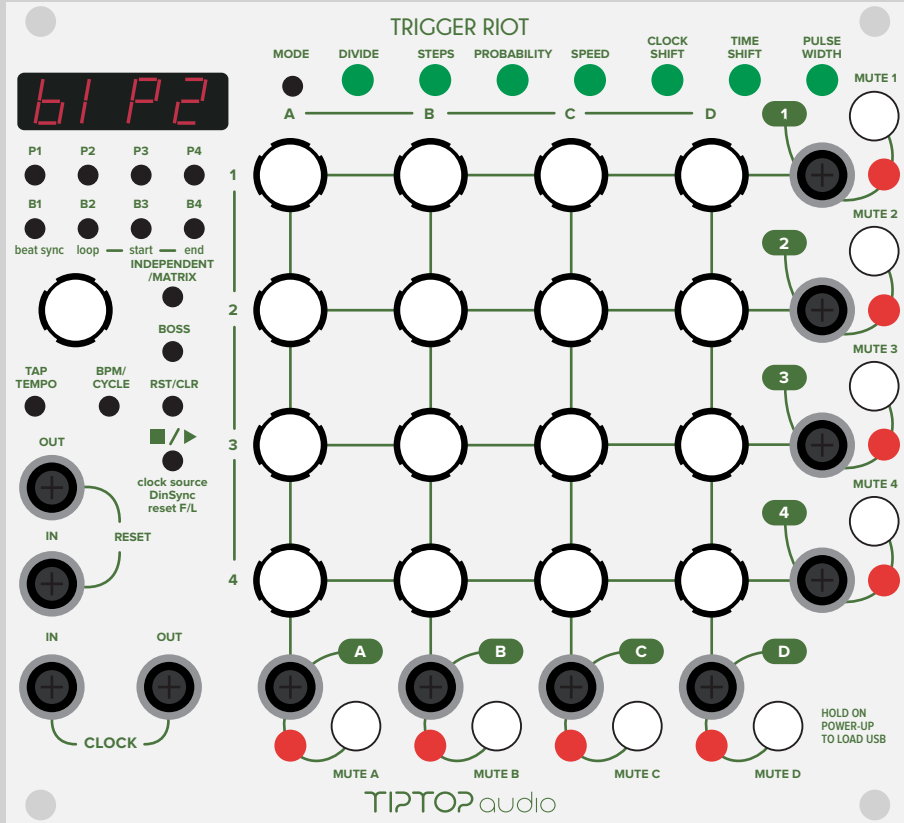


TRIGGER RIOT



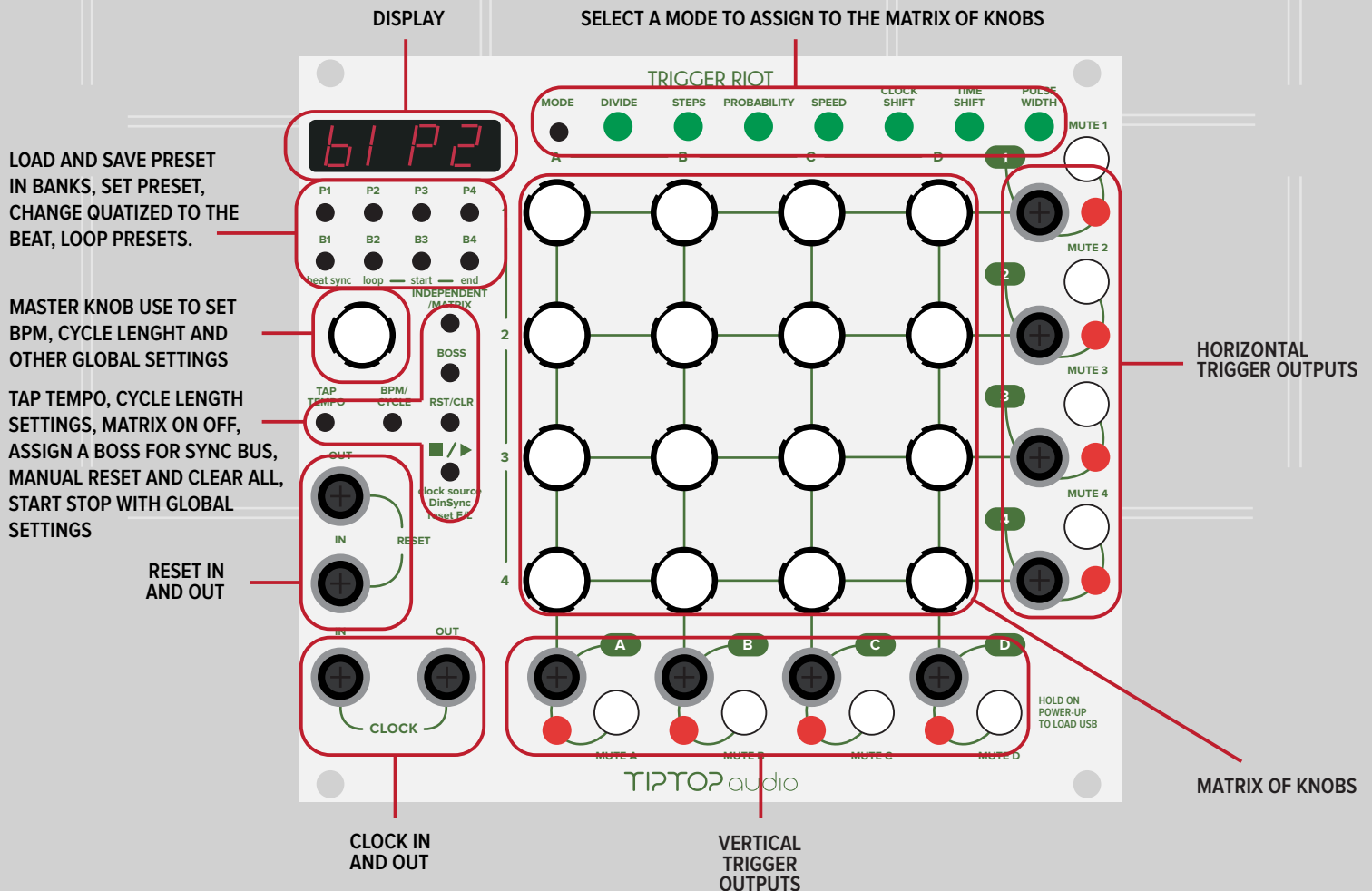
Introduction

The Trigger Riot is a multipurpose trigger module that makes ultra complex patterns of gates triggers and clock pulses. The Riot covers a lot of ground in any Eurorack system from the master clocking for your entire system to algorithmic generation of pulses for envelopes, step sequencers, drums and accents that can venture into highly complex territory driven by simple yet powerful logic and algebra with a dash of pseudo randomness for some unpredictable results.

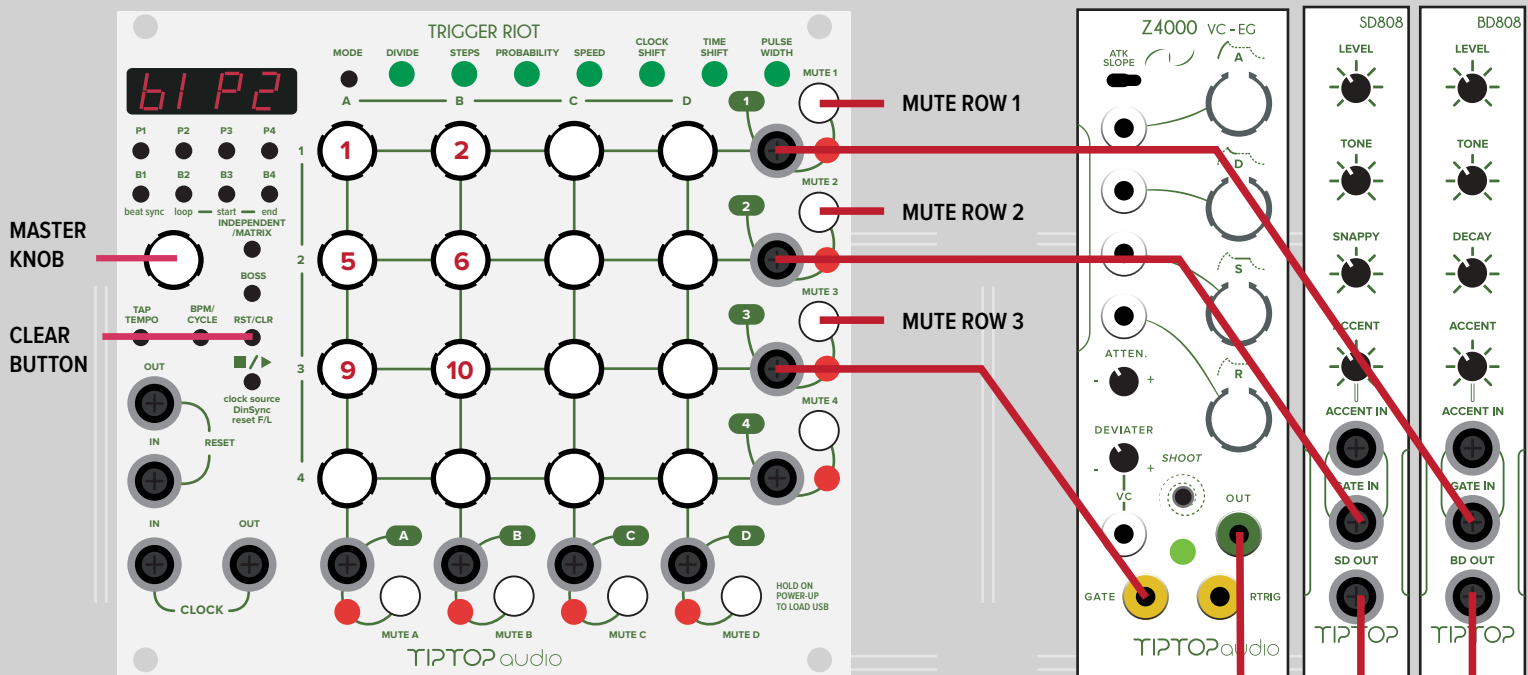
The user interface allows a great deal of control over pulses with each knob acting as a clock divider, clock multiplier, step injector, time shifter, clock shifter, pulse-width modulator, and an arithmetic probability processor. Now take that control and multiply it by 16 and feed it into 8 outputs for maximum Trigger Riot madness!

Furthermore the interface features a master clock knob, push switches to mute unmute and select rows, and multiple switches to configure, adjust, create loops and save your work for later recall from memory banks.

Trigger Riot integrates nicely in the studio with non-volatile memory, generous synchronization options with external gear including sample accurate sync with DAWs, smart synchronization to other Tiptop modules using SyncBus, and DIN Sync for vintage gear. A precise internal tempo clock generator with tap tempo and BeatSync to manage precise changes round out the features.



Riot patch 1: let's play

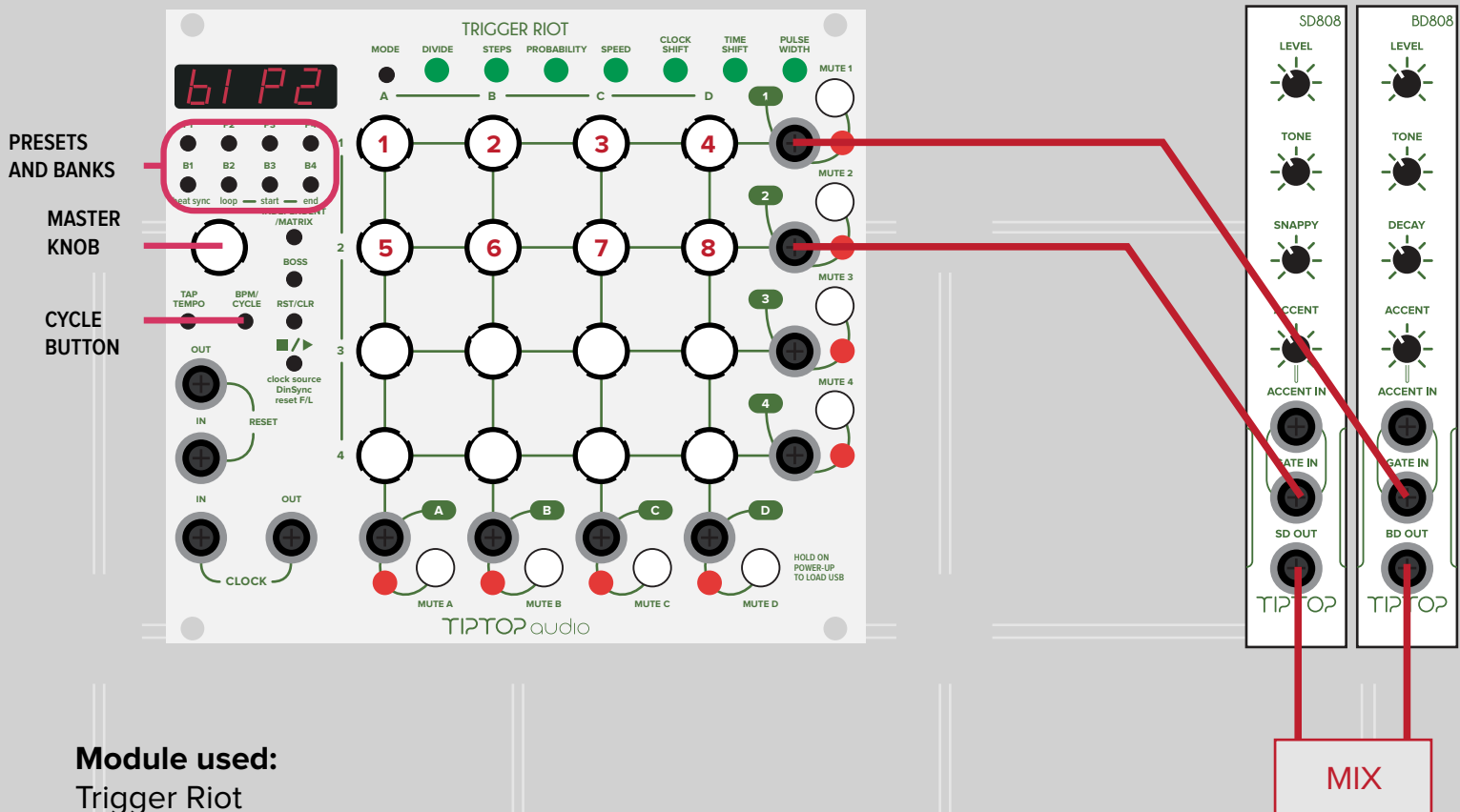


Module used:

Trigger Riot
 BD808
 SD808
 Z4000
 Z3000
 Z2040
 MIXER

- 1** Turn your Riot ON, patch OUT 1 to the BD808 Gate IN, Patch OUT 2 to the SD808 Gate IN Patch OUT 3 to the Z4000 Gate IN.
- 2** Use the master knob to set the BPM to 120. Randomly start turning knobs 1, 5, 9. As you turn the knob the display shows the division you set. Now turn knobs 2, 6, 10, you will hear how more triggers are getting added to the stream. Keep playing with all the other knobs of rows 1, 2, and 3 to keep adding triggers to create patterns.
- 3** Click on MUTE/SEL 1, 2, and 3, the LED's turn red, the trigger outs get muted; click again to unmute.
- 4** Go have some fun, if you want to start a new riot just press and hold the RST/CLR button, it will clear it all up.

Riot patch 2: OK I like it, let's go pro

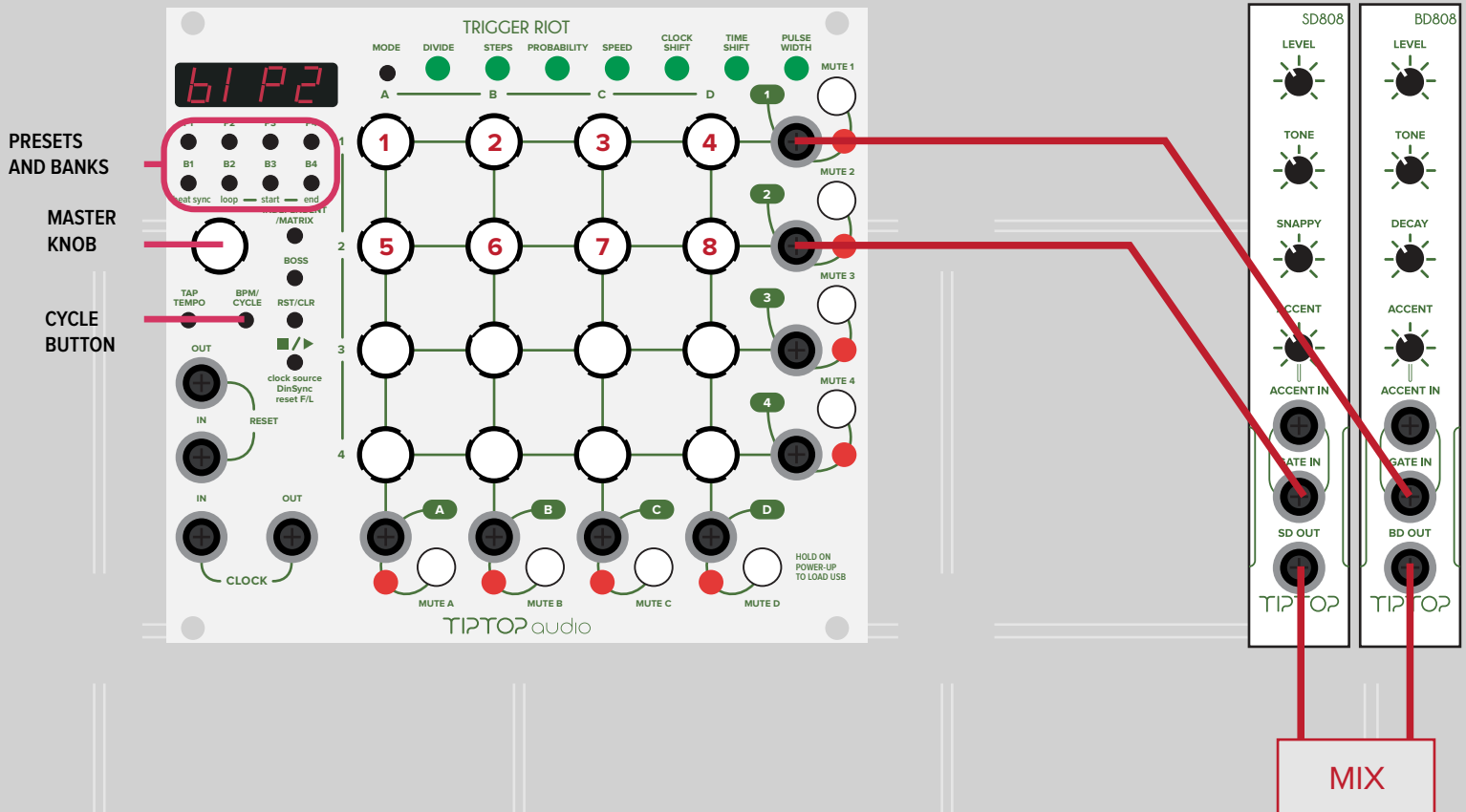


Module used:

Trigger Riot
BD808
SD808
MIXER

- 1** Turn your Riot ON, patch OUT 1 to the BD808 Gate IN, Patch OUT 2 to the SD808. Use the master knob to set the BPM to 120. Press the BPM/CYCLE button, the display will show CYCE (it's short for Cycle END), use the master knob to set the cycle endpoint to 68. Press again on BPM/CYCLE button, the display will show CYCS (short for Cycle Start), use the master knob to set it to
- 2** Turn knob 1 and set it to 4, turn knob 5 and set it to 8. Music starts playing. Turn knob 2, set it to 10, you will hear new bass drum kicking in, things start getting more interesting. Set knob 3 to 8, oops nothing seems to happen, that is because 8 is an even number so the trigger of 4 from Knob 1 already fills this spot. So turn Knob 3 to 15, now you hear it. Turn knob 4 to 61. As you see, Knob 1 2 3 and 4 are all mixed out to out 1. ack.
- 3** Now that we got a beat going, lets save it, press and hold P1 until the display says SAVE. That's it, this sequence and cycle length are now stored in preset 1. The display will show P1B1, this is Preset 1 at Bank 1 (assuming you are in bank 1).

Riot patch 2: OK I like it, let's go pro Continue...

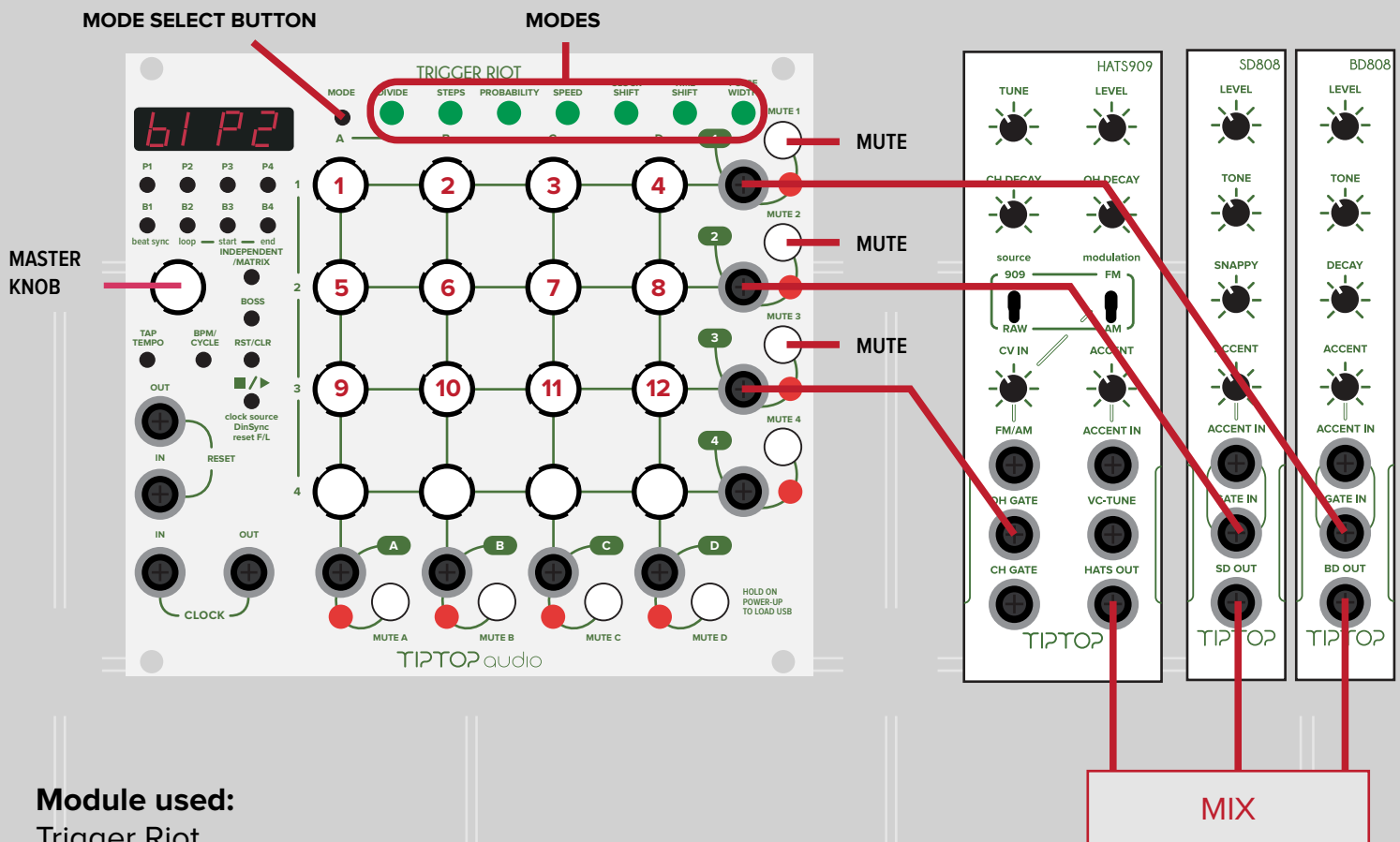


4 Lets continue the Riot, turn knob 6 and set it to 13, set knob 7 to 17. Now lets save this into preset 2, press and hold P2 till the display say SAVE. That sequence is now stored in preset 2. Now try toggling between P1 and P2 as you like. To finish this patch, lets clear everything, press and hold RST/CLR button, the Riot will clear all the settings so you can start from scratch. The presets are still saved if you want to load them. Clear is great if you feel you just want to experiment with stuff, you can always hit Clear at any time to clear it all up and start from scratch.

To summarize, you just did the following:

- Set the Riot Cycle length by setting the start and end points to 64
- Set BPM
- Set different divisions for bass drum on OUT 1
- Set different divisions for Snare drum on OUT 2
- Use the MUTE/SEL buttons to mute channels 1 and 2.
- Save the sequence to a Preset
- Do changes to the sequence and save those to another Preset
- Toggle between Presets.
- Clear the Riot to get started again.

Riot patch 3: OK this thing is really crazy, give me more



Module used:

Trigger Riot
 BD808
 SD808
 HATS909

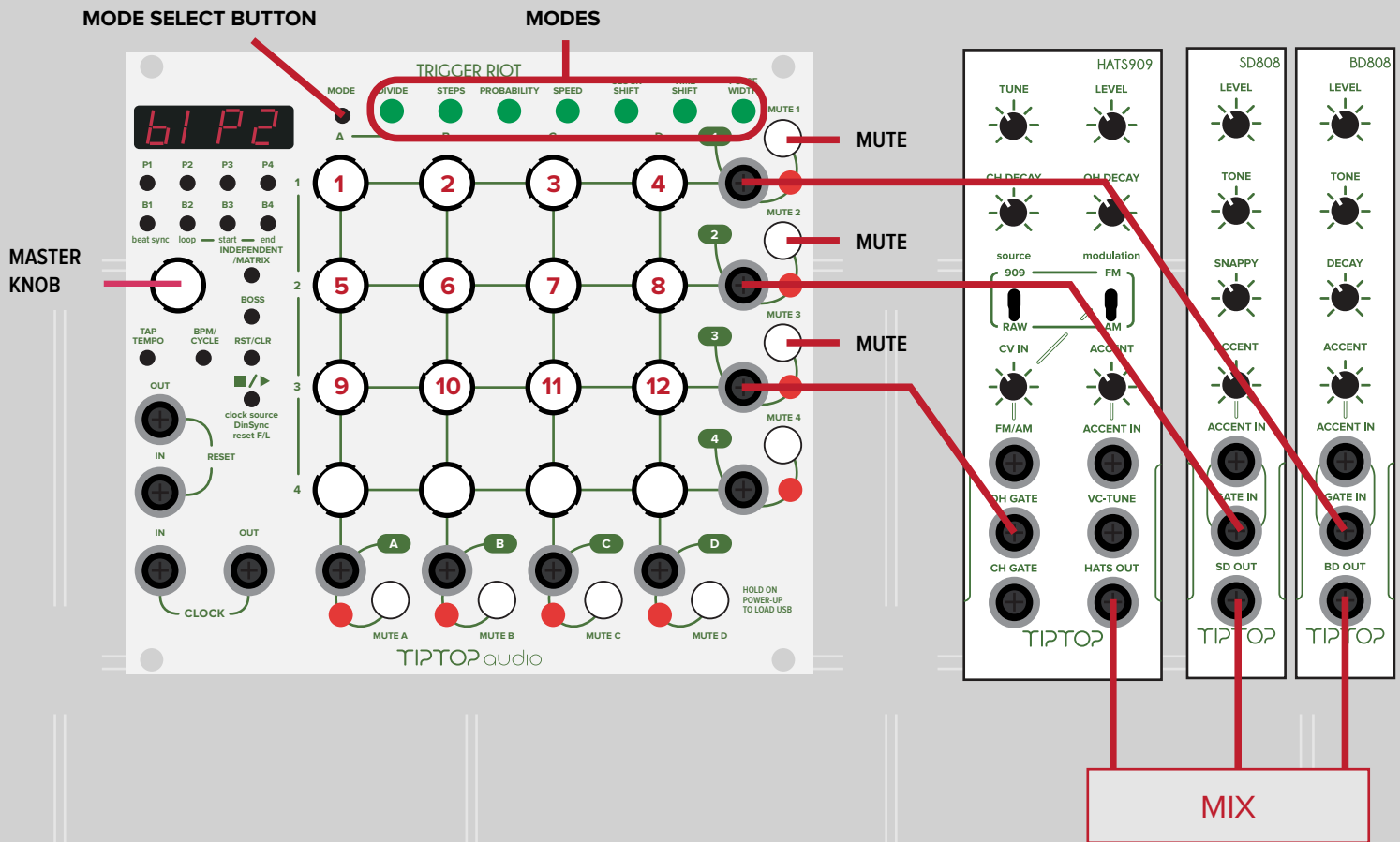
1 = Lets start again by connecting OUT 1 to BD808, OUT 2 to SD808 and lets patch OUT 3 to Open Hi-Hats 909. Lets press and hold RST/CLR button to make sure we start from scratch.

Lets set Knob 1 to 4, Knob 5 to 8, and knob 9 to 4. All three sounds will play. You will notice that the hats hit right on the bass drum, because both are set to 4. Click on the MODE button few times 'til you get to CLOCK SHIFT, now turn Knob 9 to shift the hats hits, set it to 2, you have just shifted this trigger by two clock cycles.

2 Click on MODE again to get back to DIVIDE, turn Knob 10 to 32, you will notice a break in the hats, this is done by overlapping the trigger with a long gate pulse. Click on MODE to get to PULSE WIDTH, turn Knob 10 to set a pulse width of 0, you will notice as you do that how the overlapping gets shorter and more triggers that were covered by the long pulse show up again. As you can see the Trigger Riot is both a Gate and a Trigger Sequencer combined and the interaction of the two can be creative.

3 Click on MODE to get it to TIME SHIFT, time shift lets you shift the triggers in mini clock steps, we like to call it clock particles. It shifts the trigger back or forth in time relative to the master BPM clock, turn Knob 9, as you turn it you will start hear how it shifts off the grid, getting swingy. Press and hold P3 to save it to preset 3.

Riot patch 3: OK this thing is really crazy, give me more



4 Have you noticed that the lights on OUT A and B also flash? This is because you are in Matrix mode. In Matrix mode, not only do the horizontal rows get summed up, but also vertical rows. So on OUT A you have a sum of triggers coming from Knob 1, 5, 9, and 13, or in this example the triggers of the Bass drum, Snare and Hats combine. Interesting right? Now, patch those to something; when you finish press and hold RST/CLR to clear.

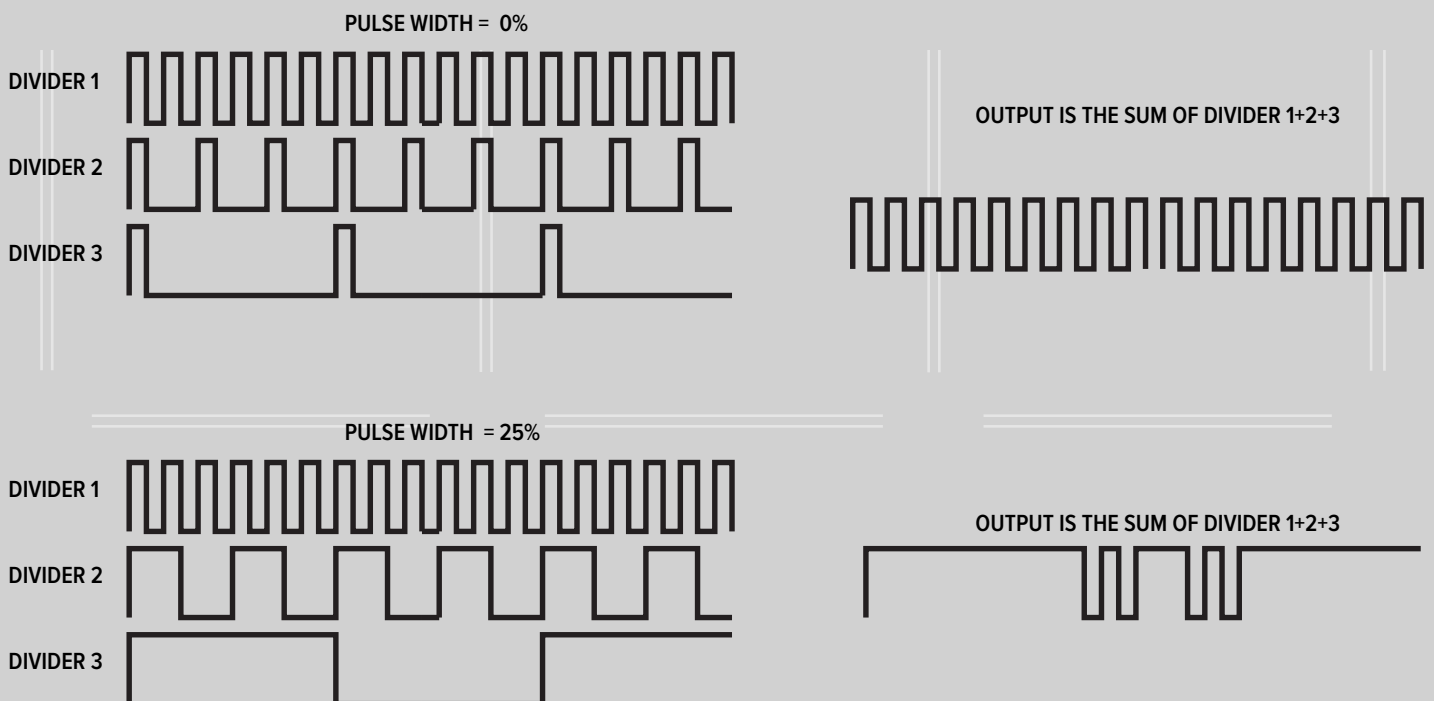
To Summarize you just did the following:

- Set divisions to all 3 sounds
- Clock Shifted the hats triggers
- Added a long gate using a Division to overlap some triggers
- Use Pulse Width to shorten the long gate and uncover the triggers below it
- Save to Preset 3
- Awareness of the Matrix mode on OUT A and OUT B
- Clear all

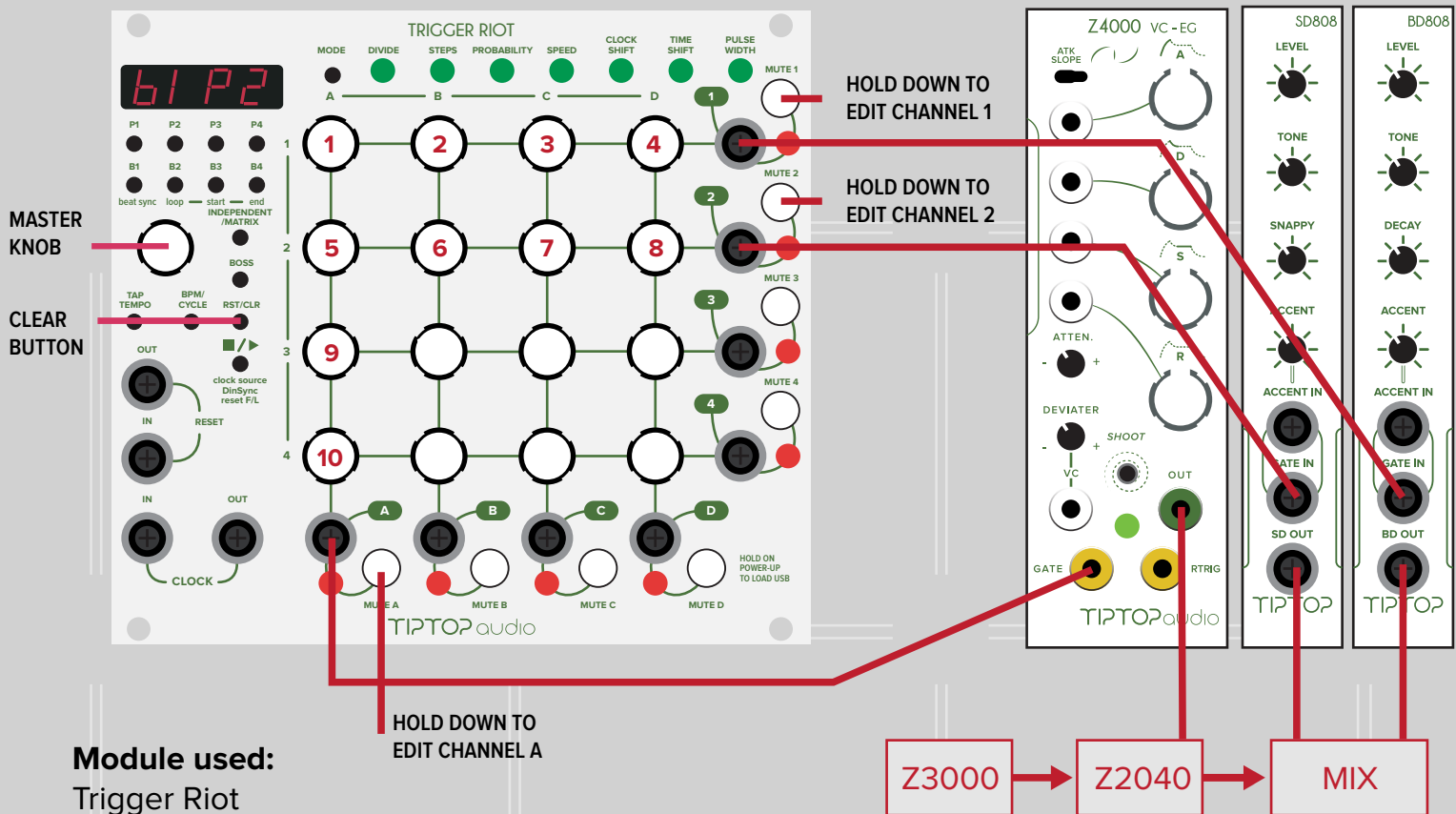
Lets take a break for a second to understand the nature of the pulse width of a clock divider, and how the Trigger Riot lets you use it creatively.

Below are two drawings of the outputs of clock dividers: on the left are the independent clock dividers, each one set to a different value, and on the right are the sum of those dividers on the output of the Trigger Riot. The top drawing shows how the triggers would look like if the pulse width was set to 0. In that case, all the pulses are one clock cycle long, therefore there is no overlapping with other pulses other than the ones set to the same division or those that fill up up the grid, like divider 1. The output is the sum of all those divisions. A pulse width set to 0 is very useful when triggering drum sounds, as it allows you to set triggers with long division yet not have overlaps that might mute off other triggers.

The lower drawing shows how the pulses look with pulse width set to 25%, in that case the pulses looks like a “proper” clock divider where the longer the division the longer the pulse. This creates overlapping and as a result the output looks more interesting and is a mix of gate and trigger signals. This is very musical when using envelope generators as it will dynamically alter the sustain portion of the envelope like keys played on a keyboard. It is also very useful to insert mutes into pulse trains of drum sounds, and as a gate sequencer to hold a long gate signals for controlling elements like the DIRECTION on a Z8000 sequencer.



Riot patch 4: OK you got me

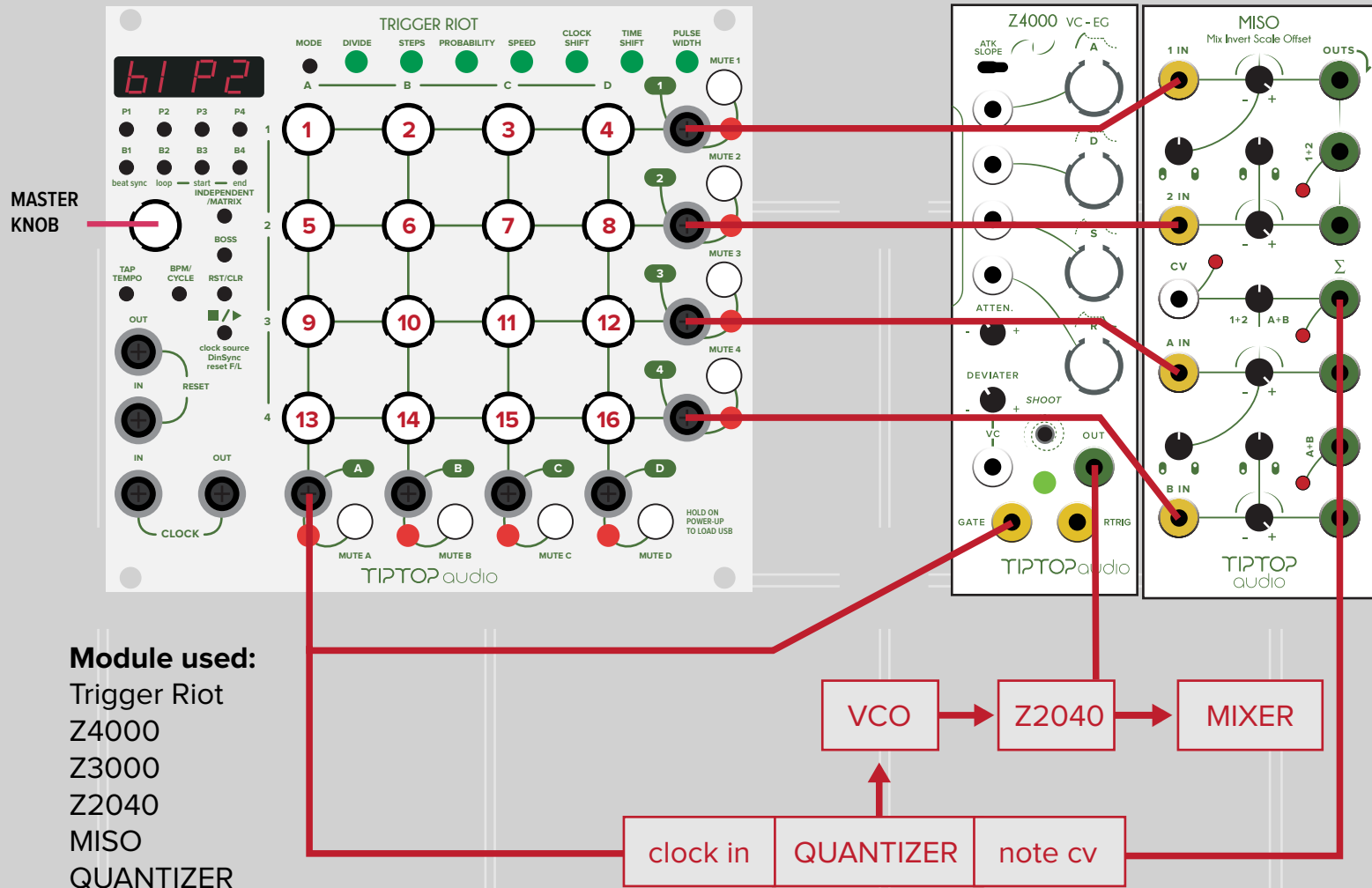


Module used:

Trigger Riot
 BD808
 SD808
 Z4000
 Z3000
 Z2040
 MIXER

- 1** By default, the Trigger Riot turns on in Matrix mode. This patch will use Independent mode. Click the INDEPENDENT/MATRIX button once. Patch OUT 1 to BD808, OUT 2 to SD808, OUT A to Z4000. Set your BPM using the master knob.
- 2** Select DIVIDE, hold MUTE/SEL-1 until the display shows the row/column, and set knob 1 to 5. In INDEPENDENT mode, you select the row or column to work on by holding the MUTE/SEL button down and the display will indicate when the row/column latches ('Ind1' to 'IndD'). Hold MUTE/SEL-2, turn knob 5 to another value, then knob 6 to add more hits. Press and hold MUTE/SEL-A, to latch, turn knob 1, turn knob 5, add more triggers using knobs 9 and 10.
- 3** Press and hold P1, the sequence will be saved to Preset 1. Click the Independent/Matrix button, the Riot will get back to Matrix mode and load Preset 1 that was saved in matrix mode from previous patch examples. As you can see, each mode, either Matrix or Independent has eight banks holding four presets each that you can save to. Not bad, eh?

Riot patch 5: Random Gate and CV



- 1 Although the Riot only outputs Gates the 5V signals can be used to generate pitch using a few other modules to convert the voltage into useful steps. MISO is used to set the pitch values and the QuantiZer turns the voltage into exact steps for the pitch.
- 2 Set the Riot to Matrix mode. Patch outputs 1-4 into the four inputs on MISO (or other CV mixer). Set divisions on knobs 1, 5, 9 and 13. Patch the output of MISO to the QuantiZer input.
- 3 Connect the output A to the clock input on the QuantiZer and the Gate input on the z4000 ADSR. Set the desired envelope shape on the z4000. This will set the rhythm for the pitch changes.
- 4 Use the scale and offset controls on MISO to change the level of the Gates coming from the Riot outputs 1-4. The Gates will combine in different ways over time and the different levels will result in creating a pitch sequence.
- 5 Add more divisions on knobs 2-4, 6-8, 10-12, and 14-6 to give more variation to the pattern. Also, the Probability parameter can add randomness to the sequence. Change the Mode to Probability and set the value to something other than 100% - lower values will occur less frequently than higher ones.
- 6 Variations to try: add a second VCO to modulate the frequency of the first (FM). Connect an individual out of MISO to the Transpose/Scale input of the QuantiZer to do timed transpositions. Use Independent mode on the Riot to control the z4000 and QuantiZer rhythm separate from the Gate sequence of steps.

Operation Guide

Manual conventions: Buttons are in **Bold** and I/O Jacks are in ***Bold Italics*** Text in single quotes (' ') denotes what is shown on the display.

Overview:

The Trigger Riot is an innovative trigger sequencer never seen before, therefore learning to use it might take a while and require an understanding of the internals. In this manual we will go through all of the different modes of operation and the way they interact with each other so you can get a real understanding of how deep this machine is. The concept is very simple to understand, the TR generates or takes in a clock signal, each of the knobs can be used as one or both of the following to generate streams of triggers and gates at the outputs:

- Programmable Clock Divider (divider)
- Clock sequencer (steps)

Once those are set, then a set of clock manipulator “effects” can be applied to the streams of triggers/gates. These effects are:

- Likelihood of trigger output (probability)
- Trigger stream whole clock offset (clock shift)
- Trigger stream fractional clock offset (time shift)
- Trigger stream multiplication fractional clock extractor (speed)
- Pulse width modulator (pulse width)

The Trigger Riot is a highly accurate clock source: it has 8 outputs, each can have up to 4 clock divisions and each of these divisions can be assigned a probability of triggering, clock shifting, time shifting, fractional clock multiplication and pulse width. Additionally, each output has 4 steps that do not repeat like a division.

Controls:

Endless rotary knobs:

TEMPO: This knob is under the LED screen. It is used to adjust Tempo in BPM, internal counter cycle start and end points, and other utility functions like clock source, rate, and beat sync.

4x4 MATRIX: These 16 knobs are used to set the various parameters for each clock divider and effects. There are two methods to use the 4x4 knobs: Matrix and Independent. In Matrix mode, the rows and columns affect the output of both sets of outputs 1-4 and A-D. Independent mode allows setting the values for the rows and columns separately. To select a row or column in Independent mode you will have to press and hold the **MUTE/SEL** button associated with that output.

Buttons:

MODE: The mode button switches between the following parameters for each division:

- 1) Divide - sets the clock division
- 2) Step - allows setting of a single trigger on a given count
- 3) Probability - sets the probability a trigger will fire
- 4) Speed - sets the time base in internal clocks
- 5) Clock Shift - delays the division by full clocks
- 6) Time Shift - delays the division by fractions of a clock
- 7) Pulse Width - duty cycle of the trigger/gate from 0% to 100%

PRESETS: Four presets for both Matrix and Independent modes for a total of 16 memories in four banks. Press and hold a preset button until the display changes to acknowledge the preset is saved ('SAVE'). Press a preset quickly to recall it. If no preset is saved in a slot, nothing is done. A preset not only saves your patterns it also saves the BPM and cycle start and end point if were set. Switching presets resets the cycle and also sends a reset pulse on the Reset out jack to synchronize with other sequencers.

BANKS: Four banks with four presets in each. Changing the bank does not change the current preset until a Preset button is pressed. The Banks have alternate functions when held for setting the Preset Looping feature and Quantizing Preset changes to the beat.

Beat Sync (B1) - ('bEAt') Quantize manual preset changes to the start of a Cycle (make sure to set Cycle Start and Cycle end). BeatSync Continue is enabled by holding the B1/BeatSync button until the display changes to 'CONT'. In this mode Presets are changed without resetting the internal counter or sending a reset. BeatSync also controls the Mutes as well as preset changes.

Loop (B2) - Loop On/Off ('LOOP') turns the looping on and off by holding this button and then using the Tempo knob.

Loop Start (B3) - Loop Start ('LPSt'). Select the Bank and Preset for the loop to begin.

Loop End (B4) - Loop End ('LPEn'). Select the Bank and Preset for the end of the loop.

Note : Loops can run forward or backwards. Also note that the internal Cycle must be set to a non-zero value or the external Reset In must be triggered for the presets to change.

BPM/CYCLE: This button toggles between the following functions: _____

1) Tempo ('bPm') - sets the Tempo in Beats Per Minute (BPM)

2) Cycle End('CYCE') - sets the internal Reset count. 0 sets the counter up to infinity. Values from 1 to 255 will reset the counter after that many clocks and, as mentioned earlier, is a great way to make things sound more repetitive.

3) Cycle Start ('CYCS') - the value the clock resets to from 1 to 255. Setting a 4 will make a division of 4 fire immediately on reset. This allows alignment with other devices like xOx style sequencers. _____

Note: After a timeout the knob returns to setting Tempo in BPM. Whatever was set is saved.

START/STOP: Starts and Stops the internal clock. Displays 'Strt' and 'Stop' on the display. On Start it sends a reset pulse on the Reset out jack to synchronize other sequencers. Hold the button down to access these features:

1) Clock Source: Select from Internal ('Int'), External ('EXT'), SyncBus ('SYNC') and Circadian Rhythms ('Cr'). Internal clock source is default. _____

2) Clock Rate: DIN Sync, DAW or 16th notes for **Clock In** and **Clock Out**.

DIN is used to sync with Roland TR series devices only, DAW has a high resolution 24 PPQN rate suitable for sync with a computer. 16th notes is default and the rate used by most Eurorack sequencers.

3) Reset First/Last : Set reset to fire on the first count or the last count of a cycle. First is default

Each button hold cycles thru these three functions and pressing the button once exits and returns to BPM. After 20 seconds it times out and returns to BPM. _____

TAP TEMPO: Press the Tap Tempo button once and the display will show 'tAP' and enable tap tempo. Press the Tap Tempo button twice more in time to set the Tempo. The new tempo will show on the display.

Tap Step: To enter Steps with the Mute/Sel buttons, hold the Tap Tempo button until 'tAPS' displays. Now single presses to the Mute/Sel button will place a Step at that beat when CYCE is not 0. The button taps are quantized to the previous 16th note, and the trigger is not fired until the next cycle. In this mode the channels will not mute however. Hold the Tap Tempo button until 'tAP' displays to exit Step Tap.

RESET/CLEAR: Press quickly to reset the internal counter to the counter reset value (CYCS) display will show ('rSEt') and a Reset pulse will be sent to the Reset jack to synchronize other sequencers to the start point. Press and hold to clear the current programmed state ('CLr'). Clearing sets all divisions to 0 (off), probability to 100 (on), steps, clock and time offset to 0 (off) and pulse width to 25%, cycle start set to 1, cycle end set to 0. Tempo is unchanged and any stored Presets are untouched as well. To clear just one row or column, hold the **Mute/Sel** button next to a trigger out of that row or column then hold down the Clear button till display says ('CLr').

MATRIX/INDEPENDENT: This selects between the default Matrix mode ('MAtr') where the rows and columns interact with each other, and Independent mode ('INdP') where each output on a row or column can have its own setting. In Independent Mode, the **Mute/Sel** buttons on the bottom and right side of the module are held down and the desired knob turned to set values in this mode. In version 1r04 and later, holding this button shows the latched row/column.

Note: The parameters in the two modes are separate so changing modes does not carry over any settings. This doubles the number of preset settings stored in the Riot.

BOSS: Select this button will make the Riot the 'Boss' when using the SyncBus between multiple units.

SEL/MUTE: The four buttons on the bottom and four on the right of the module either select which row/column the knob changes in Independent mode or mute the output. Tap the button once to mute or unmute an output in either mode (a red LED indicates a muted output). Press and hold in Independent Mode and then turn the desired knob to select the function for that specific output. For example, hold the **Mute/Sel** button next to output A and turn the third knob in the A column to set a division. In firmware 1r04 and later the buttons latch so they don't need to be held, and the display shows the row/column latched.

Input/Output:

CLOCK IN: Insert a 0-5V trigger or gate source to drive the Trigger Riot when the external clock is selected by holding the Start/Stop button. The rate for the incoming clock signal can be selected by the ('DIN') function. The two rates are 1/16th notes ('16th') or 24 PPQ DIN Sync ('DIN') based on the Roland specification.

CLOCK OUT: Outputs each clock based on the BPM and Clock setting. The two rates are 1/16th notes ('16th') or 24 PPQ DAW ('DAW') or DIN Sync ('DIN') based on the Roland specification and identical to what is set as Clock In.

RESET IN: Resets the internal count to the Cycle Start.

RESET OUT: Triggered when the internal count is reset either by the Cycle setting or by an external trigger.

OUTS: 0-5V trigger/gate outputs.

NOTES ABOUT CLOCKS:

16TH: This clock is the most common among analog sequencers. A clock is sent or received every 1/16th note. Reset In/Out is a single pulse for resetting the count.

DIN: DIN Sync (Sync 24) is only intended to sync with vintage Roland TR series devices. The clock runs at 24 PPQN (6x faster than 16th) and the Reset In/Out carries the Run signal. Run goes high on playback and low when stopped. The Riot uses delays to mimic the timing behavior of the old Roland devices and will not tightly sync with modern devices claiming to use 'DIN Sync'.

DAW: This is a 24 PPQN signal like DIN only without delays and a standard Reset pulse. Use this clock with Expert Sleepers or the pulse files in the link below to sync the Riot to a DAW with sample accuracy.

<http://www.tiptopaudio.com/manuals/crcode/pulses.zip>

CR: A type of SyncBus that ignores the Preset data which allows the Riot and Circadian Rhythms to share a clock, but run internal loops.

Use:

The Trigger Riot boots up in Matrix Mode and Divide Mode as indicated by the LED on the left of the top LED row. In this mode the encoder knob in the upper left will set a clock division for both output 1 and A. The encoder knob to the right of it will set a value for outputs 1 and B, below it 2 and A and so on.

The clock divisions range from 1 (every clock triggers output) to 255 (every 255 clocks triggers output) so very complex patterns are easy to program. Below is a simple example of setting two triggers - one to 4 and one to 9:

Output triggers on clock: 4, 8, 9, 12, 16, 18, 20, 24, 27, 28, 32, 36 (and then repeating the pattern)

At an internal Clock Division of 1/16 this would produce a 4-on-the-floor beat with rotating accents beats. To give some more variation press the **Mode** button to go to Probability Mode and dial the percentage for the 9 division back to 50%. Now there is a 50-50 chance that every 9th clock a trigger will occur.

Trigger Riot defaults to counting from 1 to 2^{32} (over 4 billion) so that extremely long patterns can evolve (like 71, 181, 252 for example). It is possible to constrain the internal counter to produce more succinct patterns. In the above example using divisions of 4 and 9, setting the internal **Cycle End** parameter to 16 would produce the following:

4, 8, 9, 12, 16

To add just a beat on the second clock, change to Step Mode and change one of the knobs to 2. This will result in the following:

2, 4, 8, 9, 12, 16

Note that divisions count clocks until it triggers, so setting a division of 4 will wait until the 4th clock after a reset to trigger. The Trigger Riot makes no distinction as to rhythmic meters at all so you are free to set whatever you like. But this may make the clock divisions seem out of sync with other equipment that have strict meters (ex. 1,5,9,13 in 4/4 time for a xOx style drum machine). To address this the internal count can be reset to a number other than 1 using the **BPM** button and setting the **Cycle Start** ('CYCS') value. A value of 4 would make that division fire immediately on reset thus lining up with a typical drum machine 4/4 pattern.

Setting a Cycle:

Press the **BPM** button under the **Tempo Knob** until the Display reads 'CYCE' for **Cycle End**. A value of 0 turns off the reset and the internal counter runs for years before reset. Setting a value from 1 to 255 will return the count to 1 in that many clock ticks. The counter counts from 1 so setting 8 will give 8 clocks between resets. The internal count can be reset to a number other than 1 using the **Cycle** button and setting the Cycle Start ('CYCS') value.

Tip: If you want to set a 64 clock cycle pattern with the bass drum set on the first clock, set Cycle End to 68 and Cycle Start to 4. Set the bass drum clock division to 4.

Note - the internal Cycle set by CYCE and CYCS will function with an external clock source (16th or DIN). Note that with a '16th' clock external resets coming in will still trigger (and Reset Out will trigger as well), but DIN Sync does not have this ability.

Step Mode:

In Step Mode, single clock counts can be set to trigger on a given output. The value ranges from 0 (off) to 255 clocks and the value is constrained by the Internal Cycle value. When using an external source to trigger the **Reset In** make sure the value of Step is less than the reset time or it will not fire. Steps can also be manually entered using Tap Step mode. Hold the **Tap Tempo** button until 'TAPS' displays. The **Mute/Sel** buttons will now enter Steps rotating through all four positions on the row/column. After entering the Steps they can be edited using the encoders.

Note - Step only works if either the internal **Cycle** is set or the **Reset In** is triggered on an interval because the internal counter default will quickly run up into the thousands and not hit any Steps.

Probability Mode:

Using probability will add some randomness to the triggering of divisions. The values range from 0% or always off, to 100% or always on, with a setting of 50% being a random coin toss. The default is 100%. Note: the Riot uses a seeded pseudo-random generator so patterns may emerge over long periods of time.

Speed Mode:

Speed is the number of internal clock ticks the division is based on. The Riot's internal clock runs at 96 PPQ (or 1/384 note) and the default clock is 24 ticks or a 16th note (1 quarter note = 96 clock ticks / 4 = 24 ticks). Any subdivision from 2 to 96 is available and very subtle rotating patterns can emerge from slightly offset Speed settings. Speed can be viewed as a clock multiplier.

Common speed settings are displayed as their notation value (t = triplet, d = dotted):

DIN	4	24 PPQN
64th	6	
32t	8	
32nd	12	
16t	16	
32d	18	
16th	24	4 PPQN
8t	32	
16d	36	
8th	48	
4t	64	
8d	72	
4th	96	1 PPQN

Clock Shift Mode:

Clock Shift moves the trigger in time by whole clocks steps. The range is from 0 to Division-1 so a division of 4 can be shifted up to 3 clock ticks.

Example:

Divide 8, Clock Shift 0 triggers on counts 8, 16, 24, 32...

Divide 8, Clock Shift 5 triggers on counts 13, 21, 29, 37...

Time Shift:

Time shift moves a trigger in time by very small increments which are a fraction of the clock rate of a division and is great for adding swing and off the grid timings.

The values are in degrees from 0 to 360 giving very fine adjustment in timing. It is also calculated after Clock Shift so Time Shift can be a fraction of the Clock Shift delay. 180 degrees is halfway between the Divide + Clock shift and the next division. The combination of Clock and Time Shift will never be more than the total time of a division.

Example:

Divide 8, Clock Shift 0, Time Shift 180: 12, 20, 28, 36

Divide 8, Clock Shift 4, Time Shift 0: 12, 20, 28, 36

Divide 8, Clock Shift 4, Time Shift 180: 14, 22, 30, 38

Pulse Width:

Pulse Width is the length of time the output pulse remains high (5V) and is a percentage of the division. Pulse Width is calculated based on the Division plus Clock and Time Shift, so shifted divisions will have proportionally shorter pulse widths.

Setting the pulse width to 0 will set the pulse width to a single internal clock cycle no matter what the division which is useful for drum triggering. The default is 25%.

Example:

Divide 16, Pulse Width 25% : Trigger high on count 16 to 19, low 20 to 31

Divide 16, Pulse Width 75% : Trigger high on count 16 to 27, low 28 to 31

Divide 16, Clock Shift 8, Pulse Width 25%: Trigger high count 24 to 29, low 30 to 31

Note: Pulse Width is additive so longer divisions with large pulse widths may block shorter divisions from firing. The pulse width is a great tool for creating rhythmic variations.

Making a Preset Loop:

Preset Looping works with both internal and external clocks. For internal clocking the Cycle End (CYCE) is used to determine when the preset changes. With an external clock the Reset signal changes to the next Preset in the loop.

Important! Each Preset in the Loop needs to have a Cycle End (CYCE) set to a non-zero value. CYCE of 0 means the cycle never ends and the loop will stay on that preset forever.

Set a Cycle:

- Press **BPM/CYCLE** until 'CYCE' displays.
- Turn the master knob to select the clock number (in 16th notes) for the end of the pattern
- Press **BPM/CYCLE** until 'CYCS'
- Turn the master knob to set the Start of the pattern
- example: set CYCE to 68 and CYCS to 4 to have a 4 bar pattern of 16th notes which resets to the 4th count

Turn Looping On/Off:

- Hold **Loop/B2** until 'LOOP' displays.
- Use the Tempo knob to change On/Off. 'On' will display if looping is on 'Off' will display if looping is off

Set Loop Start:

- Hold **Start/B3** until 'LPSt' displays.
- Press **Bank** and then **Preset** to select the loop start

Set Loop End:

- Press **End/B4** until 'LPEd' displays.
- Press **Bank** and then **Preset** to select the loop end

Note: Loop End points can be before the Start point to reverse the direction of the loop.

Firmware 1r07 adds two options to Looping:

Drunk (drnk)

- randomly moves forward or backward in the loop at the end of the cycle or reset. The current preset is never repeated.

Random (rAnd)

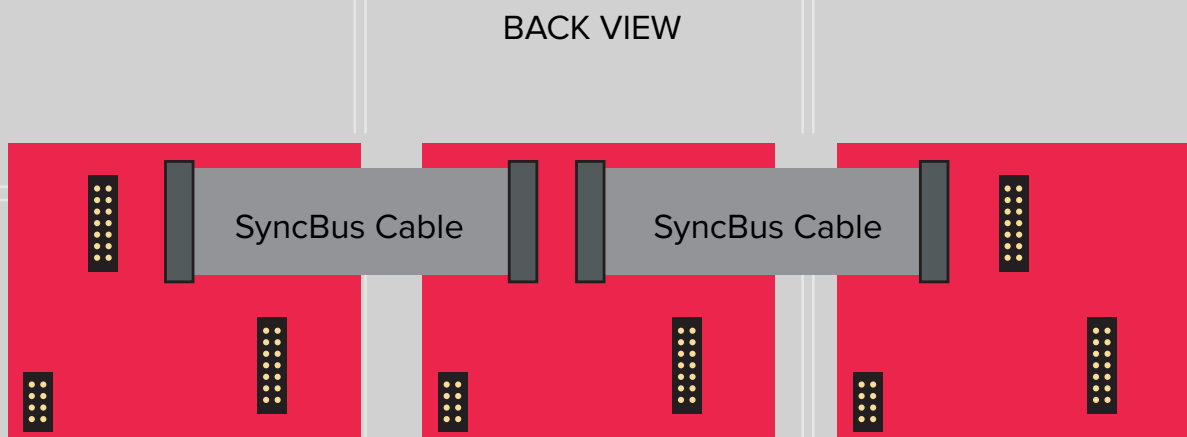
- randomly selects from any of the presets in the loop. The current preset is not excluded and can be played multiple times.

SyncBus:

The SyncBus is a unique synchronization standard that we have developed for synchronizing our sequencers with amazing timing and intelligence. The SyncBus uses high speed parallel data communication to achieve this and is the recommended method for synchronizing multiple Trigger Riots. Multiple devices are connected using a special ribbon cable on the back of the module. This connection carries clock, reset, preset and a 'Boss' signal to determine which device is the master.

Firmware version 1r04 introduced a sync mode called 'Cr' that makes sync between the Riot and Circadian Rhythms easier by ignoring the changing presets on the CR. The Riot will continue to use its internal CYCS/CYCE and Preset Loops in this mode.

Connection Diagram:



*More Trigger Riots can be connected, example shows 3 for clarity.

Activating SyncBus is very simple. Once all SyncBus cables are connected, press and hold the start/stop button until the Clock Sources appear. Use the master knob to set it to ('SYNC'). Do that on all Trigger Riots that are connected on the bus.

At this point all the Trigger Riots connected are waiting for one to take command, that is the Boss. The Boss sends information on the SyncBus setting up the BPM, preset to be played and resets. Any Trigger Riot can take control and become the new Boss at any giving time, even while playing, by holding the BOSS button until 'BOSS' displayed on the screen. The new Slaves will show 'SYNC'.

This feature allows you to control all sequencers at once from one, and at any giving time switch to control all sequencers from another. As multiple Trigger Riots might be placed in different parts of your system this gives much freedom to keep moving around.

Press the Reset/Clear button once to send a reset to all connected Riots. This syncs their internal counters.

Changing a Preset on the Boss will switch all slaves to the same Preset. Preset change is not available on the slaves.

Synchronization of the Trigger Riot to a computer DAW:

The Trigger Riot can sync to a DAW application like Pro Tools or Ableton Live using a standard audio interface and no specialized software.

Process:

Tiptop have created example files to help demonstrate this process. Download them here: <http://www.tiptopaudio.com/manuals/crcode/pulses.zip>

The files have two tracks: one channel is the 24 PPQN clock and the other a single reset pulse at the start of the clip. The files are in 10 BPM increments from 60-150 BPM. You may either edit or timestretch them to the desired tempo, but be aware the time stretch algorithm may distort the pulses to an unusable state.

- 1) Place pulse files in the timeline at the start of the session and duplicate to the desired length.
- 2) Output the **Clock** and **Reset** audio tracks to separate outputs on the audio interface. Increase the level until the signals reach about -3dBFS (3 decibels below full scale digital) to ensure a high enough level to trigger the Riot.
- 3) Connect the **Clock** and **Reset** from the audio interface outputs to the Clock In and Reset In jacks on the Riot.
- 4) Press and Hold the **Start/Stop** button on the Riot until the Clock Source displays. Turn the Tempo knob until it shows External Clock ('EXt').
- 5) Hold the **Start/Stop** button again until the Clock type displays (16th/DIN/DAW/etc) and turn the Tempo knob until ('DAW') displays.
- 6) Press the **BPM/Cycle** button until Cycle Start ('CYCS') displays. Turn the Tempo encoder until the desired first beat is set. For most 4/4 rhythms this will be 4.
- 7) Make sure the **Start** button is pressed and the display shows ('Strt') to indicate the Riot is ready for an external clock.
- 8) Press play in the DAW and the Riot will follow the Clock and Resets in the Timeline.

Boot up Functions:

To check the Riot firmware version hold the **Mode** button and power up the unit. The version will be displayed and would look something like that ('1b00'). Firmware is released periodically as we find bugs, add new features, or just keep on improving performance of the machine. The latest firmware code is available to download at the Trigger Riot product page at www.tiptopaudio.com. A video demonstrating how to upgrade is included there.

To upgrade your Trigger Riot do the following:

1. Download the file "image.hex" from our website to your computer and then copy it to a **DOS FAT32** format *USB* thumb drive. Make sure to put the file in the main directory and do not change the name of the file or add anything to it.
2. Plug the thumb drive into the USB socket on the back of the Trigger Riot, press and hold the lower right button **MUTE/SEL D** and turn the power on.

The Clock Shift light will blink to indicate a new code is being uploaded, you can release the button. Once done the module will boot up and the display will show RIOT followed by preset/bank number. You're done.

The Trigger Riot uses a non-volatile memory for saving presets and other information. Clearing the memory after code upgrades is recommended, but in most cases is not a must, as a memory clear will erase any presets you might have saved.

To clear the memory, hold down the **RST/CLR** button and power up the unit. This resets all of the presets in every bank to the default values. As soon as it finishes, the module will boot up as normal with RIOT showing up on the display.

We hope this manual served you well and helped you join the Riot. Now go make music, modular synth music.

Specifications:

- Size: 28HP
- Depth: 28mm
- Power: +12V 200ma / -12V 0ma
- Clock In: 0 to +12V
- Reset In: 0 to +12V
- Clock Out: +12V
- Reset Out: +12V
- Trigger/Gate Out: +5V