SD-808

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SD808

Introduction.

The SD808 is Roland's TR-808 snare drum sound generator adapted for modular synthesizer use. The front panel contains all of the controls found on the original TR-808 drum machine, allowing you full control over the snare drum timbres, volume levels to mix with other drums, and accent levels. The module itself is very simple and straightforward to operate; however, we highly encourage you to read this manual as it contains useful information that will help you get much more out of the SD808. These electronic drums are the heart and soul of our electronic music generation and learning how to use them correctly will open up a world of organic analog beats and sounds for you to utilize in your own music.

About the Making of the SD808.

The SD808 is a one-to-one clone of the original circuit found in Roland's TR-808 drum machine. The TR-808 was manufactured from 1980 till 1984, during this time Roland had revised parts of the machine according to what they believed would make it either sound better or electrically work better. One of the circuits that was
changed over time is the machine's white noise source: this noise source feeds different sound generators and among them is the snare drum. The freedom of having a dedicated noise source per each of our drum module allowed us to set it according to what we found to sound better, and in the case of the SD808 we went with what Roland thought to be an improvement and adapted the later noise circuit design.

When compared to several original machines we found a lot of variation, both in sound clarity at different settings, length of the envelope, and timbre changes resulting from different levels of accent. So is the SD808 sound like the original?
We believe so, the SD808 follows the original schematic and its representing math precisely, down to the smallest details.

For more in-depth information about the challenges that were facing us at making this series of modules please look at the BD808 User Guide.

Let’s get started.

To start using the SD808, just plug a gate signal into the GATE IN and plug the SD OUT to your sound system and set the LEVEL half way.

Dynamics and Gain.

Level Explained:

The SD808 offers an enhanced output gain stage over the original 808 design.
This addition allows the output signals to get very hot so that anything flowing from the module will be overdriven, generating additional harmonics and tight attacks through distortion and clipping of the sound. In fact, the SD808 can go even hotter than standard levels of modular VCO's. This capability is one of the most useful ways to get tighter and in some cases more realistic snare drum sounds out of this circuit. Obviously we didn't invent the idea, it had been done for years by stringing 808's through multiple gain stages and tubes to overdrive the levels and create distortion. However, this idea has never been implemented as part of the sound generator itself to provide hot gain levels right from the source. This effect is easily noticeable by sending the audio output into line level instruments such as computer audio interfaces, outboard multi-effects, mixers, and even low level devices like guitar pedals, mic preamps etc. This enhanced gain stage will also make any synthesizer module operate at peak levels while adding interesting harmonics or digital artifacts in the case of digital processing modules.

To get the SD808 to its hottest levels, set the LEVEL to max, set ACCENT to max, and set SNAPPY to mid-way. At these settings, the SD808 can output a signal up to 20Vp.p (Most professional computer interfaces usually start clipping at 10Vp.p!!)

On the other hand, if all you want is a nice, soft 808 sound, setting the range of the LEVEL knob somewhere between 0 to 50% will cover that.

Dynamics and Gain.

Accent and Levels:

Dynamic Accent and Level control of any drum sound in the mix is a big part of making a beat sound right. Dynamic Accent provides emphasis on a particular not through loudness. In analog circuits like the SD808, the accent pulse physically "hits" the resonating circuit harder and the white noise VCA provides not only a louder sound but also more attack and more noise to blend in (much like if you were to hit a real drum harder or softer with a drum stick.)

While the original 808 has one global accent knob affecting all of its sounds simultaneously, the SD808 (and all other drum modules in this series) offers an independent accent level control. This feature adds far more dynamics than what was possible with the original machine.

Accent Explained:

The accent input is a gate/trigger signal.

While the accent input is not in use, the incoming gate input is routed (normalized) to both the accent input and the gate input. This serves for two purposes:

1. To allow you to reach the hottest drum sound possible even when there is no accent input signal connected.

2. It makes the ACCENT knob act as a fine control of the output gain level. This is very useful in situations where the level knob range is too coarse for setting precise levels in a mix with other drum sounds.

Connecting a gate signal into the accent input will break the internal routing mentioned above and will allow for independent control over accent regardless of the incoming gate signal. In this case as long as there is no accent signal present, the drum sound will be set to the minimum accent level set internally, and once the accent input gets hit by

Tone explained.

The SD808 uses three sound generators to create the drum sounds, two of these generators are the pure sine wave T-Network oscillators. Each of these oscillators generate a sine wave that naturally decays over time. Each sine wave is set at different pitch, one low, the other high. The TONE knob sets the mix of these two generators with the low pitch sine at CCW, high pitch at CW and the mix of both in the full range sweep.

Snappy explained.

The SD808 white noise goes through a VCA that has its gain controlled by an envelope generator. The SNAPPY knob controls the envelope generator amplitude but also has a slight variation over the decay time. This either adds or subtract the white noise component to the mix with the other two sine sounds. The amount of SNAPPY also define how hard the Accent signal hitting this circuit will sound.
Great dynamics can be felt when playing the SD808 with accented and unaccented notes with SNAPPY set just a tad higher then minimum.

Adjusting the noise source:

Both the TR-808 and the SD808 comes with a trimmer that sets the gain of the White noise generator. Your SD808 comes calibrated to factory setting according to the original 808 calibration procedure. However, you are welcome to adjust it to your liking by using the trimmer located on the left side of the module. Use a small flat-headed screwdriver and experiment with different levels of noise.

808/909 Drums in the modular synth environment:

The analog drum modules in this series are made from a very well-tuned patch consisting of T-Network sine generators, noise sources, VCAs, envelopes, and filters circuits aimed at creating percussive sounds (see original patch from the 808 drum machine manual). Each drum module contains several of those "modules" patched together to create that specific sound. These internal "modules" are made from discrete parts in the most minimal way, a clever analog design. Now comes your turn to add to that patch; your modular synth is full of modules waiting to interact with the sounds coming from the drum modules. By passing these drums through your own modules, you add additional analog processing on top of the raw drum sounds, extending the patch. Here are some simple ideas:

Run two different drum sounds into a ring modulator or a VCA for some amplitude modulation effect. For example, use the BD808 and the open hi-hats from the HATS808 module for that.

Run a drum sound through a resonating filter, then run another drum sound to the CV input of that filter, modulating its cutoff, resonance, amplitude, or all of the above simultaneously! Sequence them in unison or vice versa.

Run the drums at full level through wave folders, 8-bit crushers, Z-DSP effects, band pass filters, or just about anywhere you might find to be creative. You can even send the audio out into CV inputs of just about any module.

Here at Tiptop Audio, we have a favorite patch running mixed or independent drum sounds through the Z-DSP's Bat Filter with high Q setting and variable clock, making even tighter drum hits.

Note: Keep in mind that with these drum modules, your modular system has now become a self-contained electronic music machine where a complete multitimbral piece of music can be set to play. The integration of the drum modules can create results as simple as having them play a groove alongside bass lines and other melodies or as complex as switching trigger signals on the fly while having the drum sounds go through additional sound processors and having these processors further modulated for some unpredictable and intricate percussive beats. The question you need to ask yourself is, "what will happen if I patch this drum sound into this input and how will that sound?" And that input can be just about anything: any CV inputs, audio input, waveshaper inputs, sync inputs, FM inputs, the list is as long as you can imagine. Sometimes it's very hard to predict the result, sometimes it's nothing interesting at all, and sometimes it can get downright insane! But isn't that what makes modular synthesizers so fascinating in the first place?

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