

BASS DRUM

entity



SYNTHESIZER

SYNOPSIS

The Entity Bass Drum Synthesizer is a modern amalgamation of the most important functions to create a wide range of bass, bass drum and various percussive rhythm based sounds. Additional functions have been incorporated in order to increase both the versatility in use within a modular environment and broaden the sound sculpting abilities of the Entity itself.

The Entity BDS is a studio quality, high fidelity analog design with focus on maintaining maximum clarity and dynamic range. Special care has been applied to producing an isolated, low inherent noise and high headroom device suitable for home, studio and live/DJ use. Entity excels as both a center piece or just an addition to that monster patch. But you may find that when using Entity, very few additional modules are needed to achieve satisfying results.

Please take some time to read over the manual, play with the controls and try out some examples on the following pages. Get familiar with the subtleties of the controls as you will be rewarded after just a short time of experimenting. As always, Enjoy!

1 TRIGGER INPUT and PING!

The **TRIGGER** input jack is used to initiate a percussive tone and trigger an envelope from the Rise/Fall generator. Any signal above 1V can be used - not just triggers or gates.

The **PING!** button is used to audition a sound without anything patched into the **TRIGGER** input.

2 BODY and BODY CV

The **BODY** control emulates the response of a drum head. It is a subtle control and the effect can vary depending on the status of other parameters like **RING** and **FM** levels. The center position is the most tuned response while **Tight** produces the least resonant, lowest amplitude and **loose** produces a flabbier sound. **BODY CV** works best with bipolar voltages but will accept any polarity CV. The Body Control works as an offset when external CV is used.

3 ENVELOPE GENERATOR

The built in **RISE/FALL** envelope generator is a powerful feature of the Entity BDS. It can be used to optionally modulate the frequency and/or amplitude of the sound via the **FM LVL** and **AMP** switches. The envelope can also be used stand-alone via the **+ENV** output on the bottom left of the module - or self patched from that jack into the other voltage controllable functions of Entity.

The envelope output jack is accompanied by a novel **DUCK** output. This is an inverted and positively offset copy of the envelope output. This jack can be used creatively but commonly utilized for patching into external VCA CV inputs to keep the VCA normally on until a note/envelope is triggered via Entity BDS. For instance, a bass, lead or pad could be patched into an external VCA and that signal will "duck out" in volume when Entity BDS is triggered.

RISE controls the attack stage time of the envelope, **FALL** controls the decay stage time.

The **RISE CV** and **FALL CV** inputs are used to voltage control these functions. The controls become standard CV attenuators when signals are patched into the CV inputs.

At the top left of the module are a set of switches in the **ENV SHAPE** section that independently alter the shape of the two envelope stages. These can be set to logarithmic, linear or exponential. The shapes provide a huge variety of ways to affect the frequency and/or amplitude of the resultant sound.

An interesting feature of the envelope generator is the way it is set to reset upon recurring trigger signals. Rather than reset upon every new trigger, the envelope waits until it has finished the Rise stage and reaches the re-trigger threshold during the Fall stage. This provides some additional frequency and/or amplitude dynamics to occur between a set number of sequential triggers. This affect occurs when the Rise time is set beyond the duration of the actual percussive sound produced. For instance, you can achieve effects like slight pitch and/or amplitude changes between beats or a steady rise in pitch/amplitude over a larger number of beats. Definitely worth experimenting with!

4 PITCH and 1V/OCT

The **PITCH** control tunes the tonal frequency of the output. Featuring a large span of control from about 8Hz to roughly 2.2kHz. Both higher and lower frequencies are capable using the **1V/OCT** and/or **FM CV** inputs. The **1V/OCT** input is used for tracking Entity with a sequencer, keyboard or as an additional FM input. The module will reliably track at least four or more octaves.

5 FM LVL, FM CV and FM SWITCH

The **FM LVL** control is a bipolar attenuator. Center position reduces the modulation depth to zero. Fully right is maximum positive depth, fully left is maximum inverted depth. **FM CV** jack is used for patching external modulation sources to frequency modulate the output. The switch below **FM LVL** has three positions that select the routing to the **FM LVL** control. The rightmost position selects **FM CV** only and doubles as an "OFF" selection if no CV is patched into the **FM CV** jack. The center position will sum any signal patched into **FM CV** with the internal envelope generator. The leftmost position selects the internal envelope only.

6 RING and RING CV

The **RING** control affects the resonance and resonant decay time of the output signal. The amount of resonance/decay produced by this function is independent of the other controls. However, using the internal envelope or external CV to control the amplitude (volume) in the **OUTPUT** VCA section (see below) can have an affect on how much resonant decay is heard - a useful sound design feature. At maximum setting, **RING** will produce a sustained self oscillation. When set to minimum, a small amount of resonance will still be present. The **RING CV** input is used to modulate the **RING** function and the **RING** control works like a standard attenuator when **RING CV** is in use.

7 OUTPUT, AMP CV and SWITCH

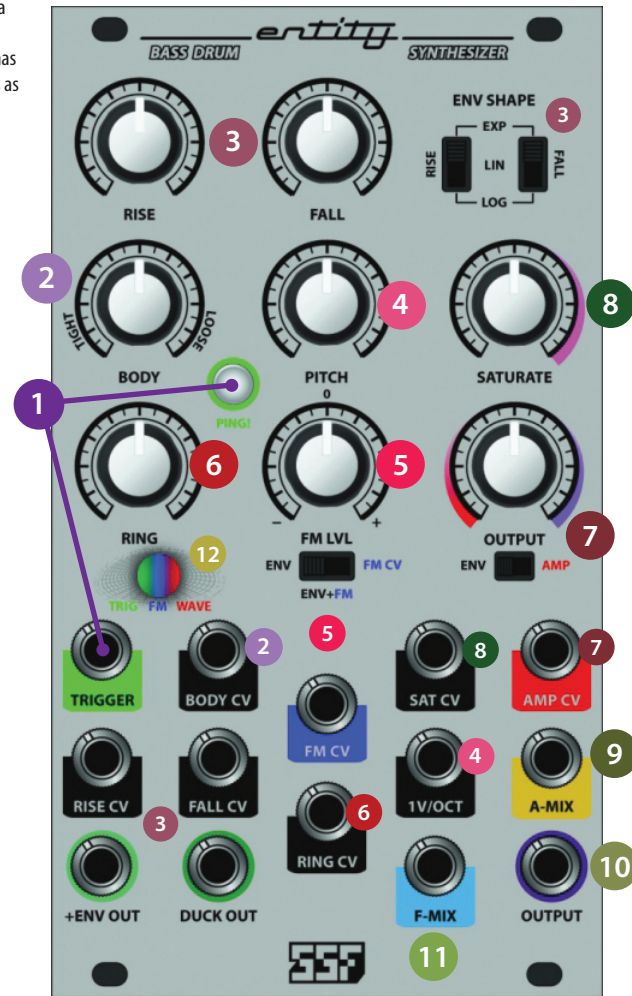
The **OUTPUT** control affects the amplitude (volume) of the sound. This control has two functions which are dependent on the position of the switch below the control. When the switch is set to **AMP**, the **OUTPUT** control works like a standard volume attenuator - min position will fully attenuate and max position produces a 16Vpp output level (while saturation level is in min position). If a signal is patched into **AMP CV**, the control behaves as a cross-fader, fading between the full CV signal value in the min position and full nominal output level in the max position. Similarly, when the switch is set to **ENV**, the control fades between the full internal envelope signal at min, and full nominal volume at max. The cross-fade feature is useful for achieving better control over signal dynamics - similar to a parallel compression type behavior. It can be useful to use the internal envelope or external CV to modify the output dynamics - for example, you could have a long RING decay set but use the AMP VCA to attenuate the sound before the RING decay ends and use the envelope shape controls to modify the amplitude dynamics etc.

8 SATURATION and SAT CV

The **SATURATION** control affects the harmonic content of the sound using a multistage, discrete transistor topology. Just a touch will add a bit of punch while the full range offers heavy saturation effects onto the output signal. When both the **OUTPUT** and **SATURATION** controls are at max, a small amount of hard clipping is introduced. If only soft clipping is desired (more bass heavy, softer high frequency distortion) you can back down on the output control. The saturator does add a bit of amplitude to the signal but the already high headroom of the output section allows you to back off the output level a bit while still retaining a higher than normal output volume.

9 A-MIX INPUT

A-MIX is short for Amplifier Mix. This is an auxiliary input into the final output VCA stage. This input is useful for mixing other signals with the Entity BDS sounds. For example, noise can be mixed with the output to make a snare sound, etc. Using the internal envelope or an external CV to control the output levels will help to shape these signals into percussive sounds.



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OUTPUT

Entity BDS **OUTPUT** jack. The default output and signals mixed into the F-MIX and A-MIX inputs are routed here.

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F-MIX INPUT

F-MIX is the direct input into Entity's resonant filter. This input is used for a number of functions as described below:

1. VOLTAGE CONTROLLED RESONANT FILTER:

Patch an external signal into the **F-MIX** input. The **PITCH** control affects the cutoff frequency of the filter and **RING** controls the resonance (there will always be a little bit of resonance present at the minimum **RING** setting). **SATURATION** affects the harmonic content as usual.

2. DYNAMIC RESONANT VCF:

For producing acid bass and lead lines and other frequency based rhythmic effects. Extending the abilities from function (1) above, The trigger input is utilized for triggering the internal envelope. The envelope can then be switched on to affect the FM and/or amplitude of the signal. Use the **FM LVL** control to affect the strength of the percussive accent upon the filtered signal. An external modulator can also be combined with the internal envelope when the **ENV+FM** switch is engaged and an external modulator is patched into the **FM CV** input.

EXAMPLE:

Patch a square or saw wave into the **F-MIX** input. Use a sequencer to affect the pitch of the source VCO if desired. Patch a trigger source into the **TRIGGER** input. Pattern based gate sequencers like GateStorm produce the most interesting effects. Switch the **FM LVL** control to **ENV** or **ENV+FM** and use the attenuator to affect the depth of modulation. Experiment with the envelope shapes and timing, depth of modulation and other controls. The **OUTPUT** can optionally be set to **ENV** to affect the volume ratio of the accented and non-accented material with the **OUTPUT** control. For further processing, try patching the internal **+ENV** or **DUCK** outputs to affect the other modules you may be using.

3. AUXILIARY TRIGGER INPUT:

You can use the **F-MIX** input as an AUX trigger when producing percussive or bass-line sounds. The effect is that of a muted version of the main percussive output and will produce a wide range of dynamic rhythms and sense of movement. It is recommended to use a gate or trigger source with variable pulse width for greatly enhanced swing and variations of this effect. A 10V amplitude trigger or gate source is recommended for the strongest effect.

EXAMPLE:

Patch a gate sequencer into the **TRIGGER** input and create a pattern on the sequencer. Create another pattern using the same sequencer or another module synced to the first sequencer. Patch the second pattern into the **F-MIX** input. You will notice the auxiliary muted percussion in relation to the main sound. Now try varying the pulse-width of the secondary pattern. Notice how the swing of the rhythm changes with the pulse width but the main sound keeps in time. Experiment using all the controls and switch settings.

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RGB STATUS LED

This LED provides visual feedback for the major functions related to the processed signal.

An active **trigger** is displayed in **green**. The duration of the green pulse is affected by the **BODY** control as a faster green blip indicates a tight response and a longer pulse indicates a loose response.

Depth of **frequency modulation** is displayed in **blue**. Whether positive or negative, the level of depth is always indicated by the intensity of the blue portion of the LED.

The **output waveform** is displayed in **red**.

ADVANCED PATCHING AND TECHNIQUES

The controls and internal routing of the Entity BDS are capable of producing a very large variety of sounds on their own. However, all those CV input jacks are not there to just fill empty space! In this section we highlight some important processing features that may or not be obvious.

IN GENERAL

LFOs and Envelopes from other modules are typical sources of external modulation and they work great with Entity. But it is worth noting that while we are using clocks and pattern based gate sequencers to trigger entity, they also work great as stepped DC modulation sources. For instance, if we have a pattern setup to trigger the main drum sound on the quarter note of a sequence, we could patch a half note division (or another pattern) into one or more of the CV inputs to change the sound on every other beat. Remember that the controls will then become attenuators for the incoming CV when we do this. Using gates as modulation sources is not absolutely necessary but good knowledge to have if modulation sources are limited or used up in your eurorack system as well as provide an absolute level change as dialed in by the attenuators on Entity BDS.

SELF-PATCHING

Entity can also be self patched. Below you will find the possible arrangements:

+ENV and/or DUCK can be patched into:

BODY CV, RING CV, SAT CV, 1V/OCT CV, F-MIX or A-MIX (in some cases, patching the envelope into the audio inputs can produce subtle emphasis or introduce additional frequency dynamics)

When using a mult or stackable cable, the output can be fed back into the CV or audio inputs. Most notably, when fed back into the A-MIX input, super saturated sounds are achieved and even chaotic self oscillations. If the oscillations are not desired (perhaps in most cases) turn down the OUTPUT a bit until a stable point or desired effect is achieved. You may also try The F-MIX input for a more subtle effect.

ACCENTS

As you may have noticed, Entity does not have an official accent input. This is because the Entity can produce different kinds of accents via using the CV inputs. We can use the FM inputs for frequency based accenting, amplitude based accents with the AMP CV input and freq/amplitude based accents using the SAT CV input. Additionally, anti-accents or muting are also possible with negative going CV or even still with positive CV when patched into the RISE or FALL CV inputs.

AUDIO and CV LEVELS**OUTPUT LEVEL**

As mentioned, the nominal maximum output level of Entity is 16Vpp (-8V, +8V). Nominal eurorack audio levels are typically 10Vpp. The Saturator will push this level into hard clipping through the internal amplifier when set to maximum. The saturator is a high gain device. By its nature, everything that passes through it is amplified, including the noise floor. Entity is very low noise and includes features that substantially reduce the amount of external noise present in most eurorack systems. However, no design is completely free of noise. Some, although only slightly audible noise may be heard if the output and saturation controls are at maximum and the Entity is the only source being auditioned. If this was ever an issue, one can simply turn down the output slightly until the noise is inaudible and still maintain a higher than typical output level. In most cases (like within a mix) the noise may never be heard at all - even at max output and saturation settings - but important to point out none the less...

CV INPUT LEVELS

RISE, FALL, RING, SAT and AMP CV inputs require +8 to +10V for nominal operation. Bipolar or negative voltages will not harm these inputs but expect little to no response from CV signals in the negative region.

BODY, FM CV and 1V/OCT require any positive, negative or bipolar CV source - in other words, anything your modular system can produce is accepted and usable.

CV OUTPUT LEVELS

+ENV and DUCK output swing is 0V to +10Vp.

PATCH SHEETS

Patch sheets are download-able via the Entity BDS product page on our website: steadystatefate.com

Current and future presets will also be available for viewing here. If you would like to submit a preset, please share with us via our contact page on the company website.

POWER CONSUMPTION

QUIESCENT: +61mA, -91mA

MAXIMUM: +72mA, -125mA