



Thank you for your purchase of the DrumDokta DRM-110 eurorack module.

At the core of the DrumDokta is a 1:1 clone of the old school Boss DR-110, the bastard child of the Roland x0x series. The original had a rather grungy “electro” sound and was certainly never intended to be an audiophile machine. The DrumDokta is no different in this regard, but with some added controls and extensions over the voice parameters the sound can be taken beyond the original unit.

As with the DR-110 the DrumDokta inherits cool things like the ability to accent notes after they have been struck. However where the original only had a balance control the DrumDokta has things like Bass Drum feedback and 808 style “tone”, Snare Drum snappy and pitch, control over the bandpass filters and decay for the Cymbal and Open HiHats.

One thing that is missing with the DrumDokta from the original is the hand clap, but a breakout module will be available in the near future to address this and add some other useful features. The DDB will add outputs from the raw building blocks of the drum sounds and the hand clap voice to the DrumDokta. More information about the breakout can be found on

<http://www.dinsync.info>

What we end up with is a cross, somewhere between a ghetto tr606 and a cr78. Grungy beats with a high noise floor but a lot of charm and character. The idea for the project started since I was often using more than 50% of my modular just to make drum sounds. Sure there are already drum modules on the market but most take up vast amounts of modular real estate and that's not to mention the price. There had to be a better way I thought. So here you have it, a low cost, low panel space solution for drums that wont break the bank or take up too much room in your case.

Now before you head off and explore the possibilities please take a moment to read the installation and quick start notes, it won't take a moment and will make all the difference. If you are still stuck then be sure to check the troubleshooting guide towards the end of the manual.

I hope you will be satisfied with your new module

Paul

Who reads manuals anyway?

I know right? but please at least read the installation and quick start.

Installation

The DrumDokta has reverse power protection, so plugging the power cable in backwards should result in no damage to the module itself. However plugging things in backwards is never a good idea and could potentially damage other parts of your system. The protection is there in case of plugging the power cable in backwards by accident, please still take care to check the orientation of the cable when connecting it for the first time.

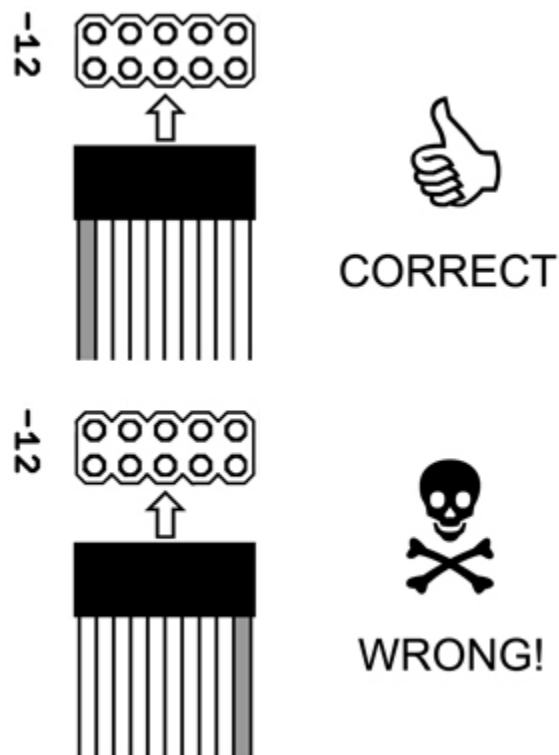


figure 1 - the correct and wrong way to connect power

Before installing please power off your modular case. Connect one end of the cable to the module as shown in **figure 1**. Connect the other end of the cable to your modular case bus board, please check your case's manual for the correct orientation. The stripe on the cable should be connected to -12. After you have connected the power you can mount the module using the included screws, the DrumDokta requires 16HP of cabinet space (you may want to reserve 8HP on the right hand side if you plan on using the forthcoming breakout module)

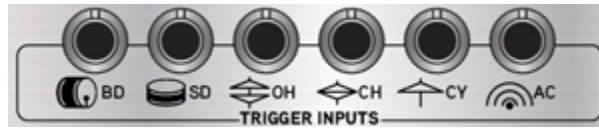
Quick Start

After you have installed your DrumDokta, set the panel controls as shown in figure 2. This will give you a standard DR-110 patch. As with all vintage Roland gear no two DR-110's sound exactly the same, this is also true with the DrumDokta but this patch will get you in the correct area. After setting up, patch various triggers to the trigger inputs and test out the various sounds.

One thing to note, use 10ms triggers for normal drum sounds and be sure to trigger the accents to get some weight in the sound. I often trigger accents on 16ths if I want standard drums, or at the very least I accent my bass drums and snares. If you aren't getting the desired result you may be using something other than 10ms triggers or perhaps forgetting to use the accents. See the following sections "**Triggers are Everything**" and "**Accents Bring the Boom**"



figure 2 - a standard DR-110 patch



Triggers are everything!

Indeed they are when it comes to the DrumDokta and it should be noted that **gates are not the same as triggers**. The DrumDokta does not have any gate to trigger processing, so to get a standard DR-110 drum sound you need to use 10ms triggers, using shorter triggers will result in tighter hits and using longer triggers or gates will result in slurring of the drum sounds. Not including gate to trigger conversions on the inputs opens up the DrumDokta's palette of sound, try using long gates to create weird atmospheres and drones outside of the realm of normal drum sounds.

Figure 3 shows a "perfect" trigger for normal drum sounds. The original DR-110 used a cpu to create its triggers in an "S-Trig" style, that's to say it would short the voice trigger input to ground to sound the voice. In the DrumDokta this is not the case, standard positive 1-12v triggers will work. The trigger LEDs are parasitic and are lit from the trigger pulse itself, so if you are using a low voltage trigger, the voice will still sound but the LED may be very dim. Likewise if using a hot trigger the voice will sound and the LED may be very bright.

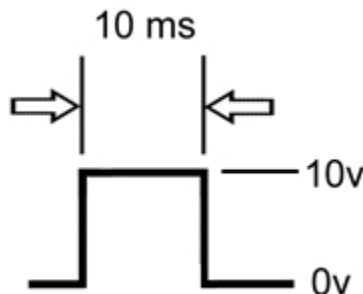


figure 3 - a "perfect" trigger

If you don't have access to 10ms triggers, don't forget you can create quasi triggers from gates using a fast envelope. Patch your gate to the envelope trigger input, turn the ADSR controls to minimum and connect the envelope output directly into a DrumDokta trigger input, adjust the decay until you get a skinny trigger. You could also use the envelope output as a clock source to a clock divider such as the 4MS RCD and use the divisions to drive the DrumDokta trigger inputs. Many clock dividers will output their divisions with the same pulse width duty as the incoming signal. Alternatively you could use a triangle LFO to drive an RCD, at medium to fast frequencies it will make suitable triggers (slower rates will produce gates). See this video for some tips. <http://www.dinsync.info/2011/11/how-to-make-10ms-triggers-for-drumdokka.html>



Accents bring the boom!



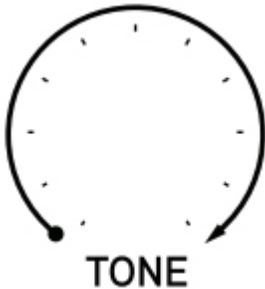
Can't stress this point enough. The accent is key to getting phat drum sounds, not only do accents make drum sounds louder but will enable some dynamics between accented and non accented sounds. Personally I like to have the accent knob dialed at maximum and accents triggered on at least the bass drum and snares.

Accent also affects sounds after they have been triggered, try setting the cymbal to max decay and triggering accents on the tail, this is a quirk of the original circuit and can lead to some interesting rhythmic sounds.



Bass Drum

With the Bass Drum there is certainly a sweet spot in relation to triggering, control settings and the balance control as explained below. Also if you are triggering accents after the initial trigger and have the feedback set on the edge of self oscillation the following accents can cause the bass drum to flap. Of course this can be used to effect but taking some time to learn the relationships here are important if you want standard drum sounds.



The DrumDokta Bass Drum has been extended from the original DR-110 Bass Drum. The tone control affects the initial transient click, like on the TR-808.

Naming it tone is perhaps a little misleading but it seemed to be a good idea to stick with the odd Roland naming convention.



The feedback control essentially works as a decay control and adds TR-808 style boom to the sound. At higher levels the voice will self oscillate, which can be useful for experimental drones.

The self oscillation point is affected by the position of the balance control knob. From around a setting of 50% and above on the balance control there will be no self oscillation even with the feedback at maximum. With the balance control at less than 50% the self oscillation point of the feedback knob will move from maximum to around 80%. Understanding the relationship between these two knobs is vital to getting good 808 style kicks, experiment here to find the settings that suit your needs the best.



Snare Drum

The Snare Drum is made from two elements, a noise generator and an oscillator, the controls allow you to manipulate these elements independently.



The Snappy control lets you set the amount of the noise portion of the snare sound. After around 30% or so additional added noise is subtle.

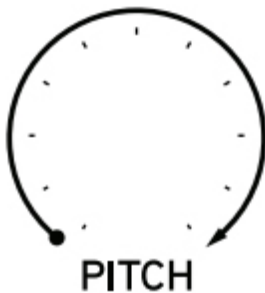
The control also doubles as an offset for the Snap CV input jack.



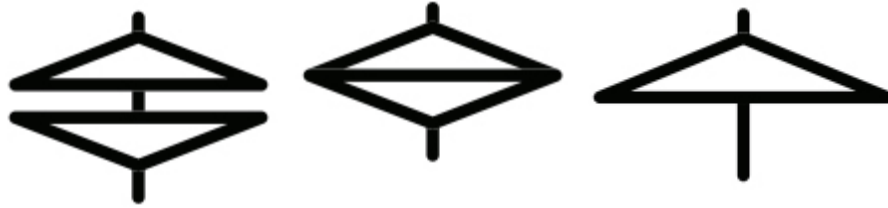
The Snap CV jack is used to control the Snappy amount via control voltage. The more voltage applied the less noise is heard in the voice. In fact its possible to mute the snare portion (dependant on the position of the Snappy knob). When voltage is applied the range of the Snappy control knob is less subtle than without CV control.

If a jack is plugged in without a voltage applied the Snappy control knob will have no effect.

The SNAP CV works best with LFO / ENV outputs or voltage offsets.



The Pitch control lets you adjust the tuning of the snare drum oscillator portion.



Open Hats, Closed Hats and Cymbals

The Hi-Hats and Cymbal are created using a noise generator and several oscillators which are mixed and band pass filtered. There are two band pass filters, the first one affects both hi-hats and cymbals, whereas the second one only affects the cymbal. As is the norm with drum machines, playing a closed hi-hat will mute any playing open hi-hat.



The BPF1 control sets the base frequency of the first band pass filter. Both the hihats and Cymbal pass through this filter and so the setting of this control will affect them all. In some cases if set to maximum some unusual high pitched sounding timbres can be heard after a few moments (the same as applying CV over 6v).



The BPF1 jack is used to control the BF1 control amount via voltage. The BPF1 control knob will then work as an offset.

Setting the BPF1 control towards maximum and using control voltages over 6v will create some unusual high pitched sounding timbres.

If a jack is plugged in without a voltage applied the BPF1 control knob will have no effect.

The BPF1 CV works best with LFO / ENV outputs or voltage offsets.



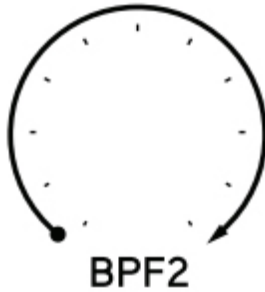
The OH Decay does what it says on the tin, it sets the decay time of the Open Hi-Hat.

At the minimum setting the Open Hi-Hat will be essentially completely closed and will not sound at all. At maximum settings and using a 10ms trigger the Open Hi-Hat will ring between 1 and 2 seconds or until a Closed Hi-Hat is triggered.



The CY Decay also does what it says on the tin, it sets the decay time of the Cymbal.

At the minimum setting the Cymbal will be essentially completely closed and will not sound at all. At maximum settings and using a 10ms trigger the Cymbal will ring between 1 and 2 seconds.



The BPF2 control sets the base frequency of the second band pass filter. Only the Cymbal passes through this filter and so the setting of this control will affect only the Cymbal.



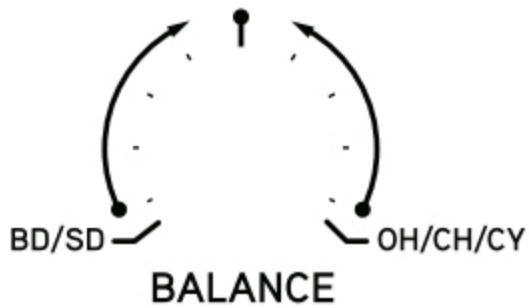
The BPF2 jack is used to control the BF2 control amount via voltage. The BPF2 control knob will then work as an offset.

Setting the BPF2 control towards maximum and using control voltages over 6v will create some unusual high pitched sounding timbres.

If a jack is plugged in without a voltage applied the BPF2 control knob will have no effect.

The BPF2 CV works best with LFO / ENV outputs or voltage offsets.

Balance Control



The balance control sets the output mix between the Bass Drum / Snare Drum and the Hi-Hats / Cymbals (and Hand Clap if using a DDB2)

As on the original DR-110 a decent balance between both is oddly around the 10 o'clock position.

Gain Control



The gain knob controls the output amplitude and also allows to drive the sound a little. At a setting around 50% drum sounds will be as loud as possible before clipping. From 50% to 100% sounds will start to be driven as they approach the power rail limit of the op-amp.

Trouble Shooting

Q: I can't make normal drum machine sounds, just drones or stuck on sounds.

A: In order to make normal drum machine sounds you need to use 10ms triggers, please read the "Triggers are Everything" section in the Quick Start.

Q: I can see the trigger LEDs lighting but no sound is heard.

A: Please check that you have connected the power cable correctly, the LEDs are driven parasitically from the trigger signal itself and hence will light up even when the DrumDokta is not powered.

Q: I noticed the main output is noisy when nothing is playing.

A: The DrumDokta is a little noisy. There is a little bleed from the original circuit design, which when boosted to modular level is naturally accentuated. It's perfectly normal and nothing to worry about. A good tip to get a good signal to noise is to set the gain to 50%, accent to 100% and trigger accents on bassdrums, snares etc.

Q: I can't get the booming sounds as in the online videos you made.

A: Don't forget to trigger the accents, please read the "Accents bring the boom" section in the quick start.

Q: With the balance at 50% the hats and cymbals are too loud.

A: This is the same on the original unit, personally i prefer to have the balance around the 10 o'clock mark which is a nice mix between the sounds (ymwv)

Q: I hear a constant low tone even though I'm not triggering sounds.

A: The Bass Drum section is probably self oscillating, turn down the feedback a little or adjust the balance control. See the section about the feedback and balance control relationship in the Bass Drum section of the manual.

Q: I hear a whooshing sound when turning the Snare Drum pitch knob.

A: This is normal behaviour.

Acknowledgements

many thanks go out to

Stephen Kwartler from <http://www.pro-modular.com> for the panel design.

Erwin Van Looveren for providing the DR-110 used in the research and development of this project.

Chris “Infradead” Lehfeldt for beta testing and taking the “Dr Protomonger” prototype far and beyond the normal drum machine sound.

Specifications

Size: 16 HP

Depth: 43 mm (depth is measured from the rear of the faceplate to the edge of the supplied and connected power cable)

Power consumption: <20 mA (<15mA +12, <5mA -12)