

# DistBlock Manual

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## 1 Overview

It is a Realtime-time Distortion Stacking Application/Plugin that allows users to stack different types of clipping functions to customize their own distortion sound. It was developed using the JUCE framework, which is considered an industry standard for developing audio applications and plugins.

### 1.1 Functions:

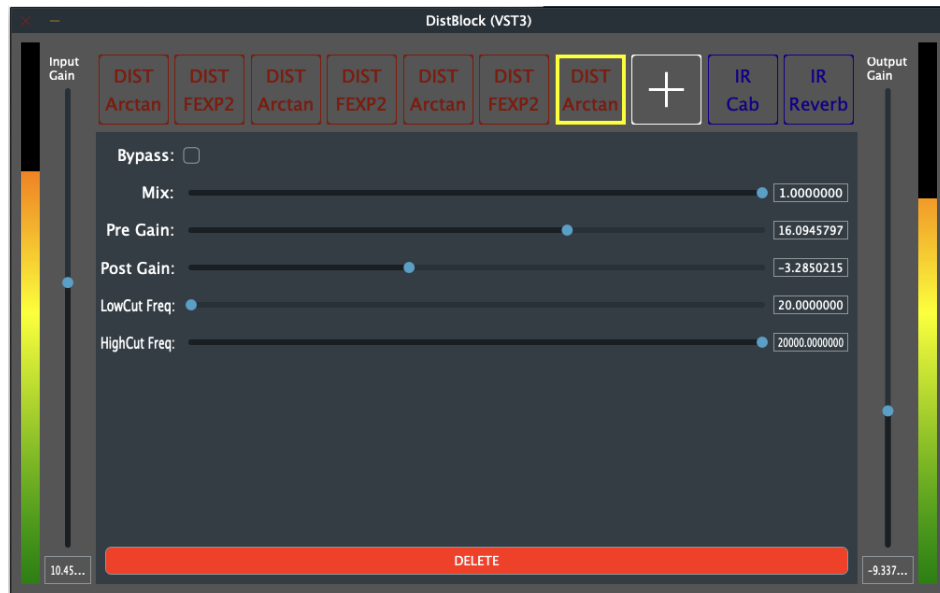


Figure 1: Screen shot of the application

- Input/Out RMS Meter and Global Adjustable gain.

- Ten serial processing slots for dynamically inserting or deleting processing blocks.
- Multiple real-time adjustable parameters
- Multiple predefined transfer functions
- IR Loader (Fast Convolution)

## 2 How to use it

### 2.1 Insert a New Block

Click on any empty block to open the type selection panel. You can choose whether to create a distortion block or an IR block. After confirming your choice, click the 'Create Effect Block' button below to create and insert a new processing block into the empty slot you selected.

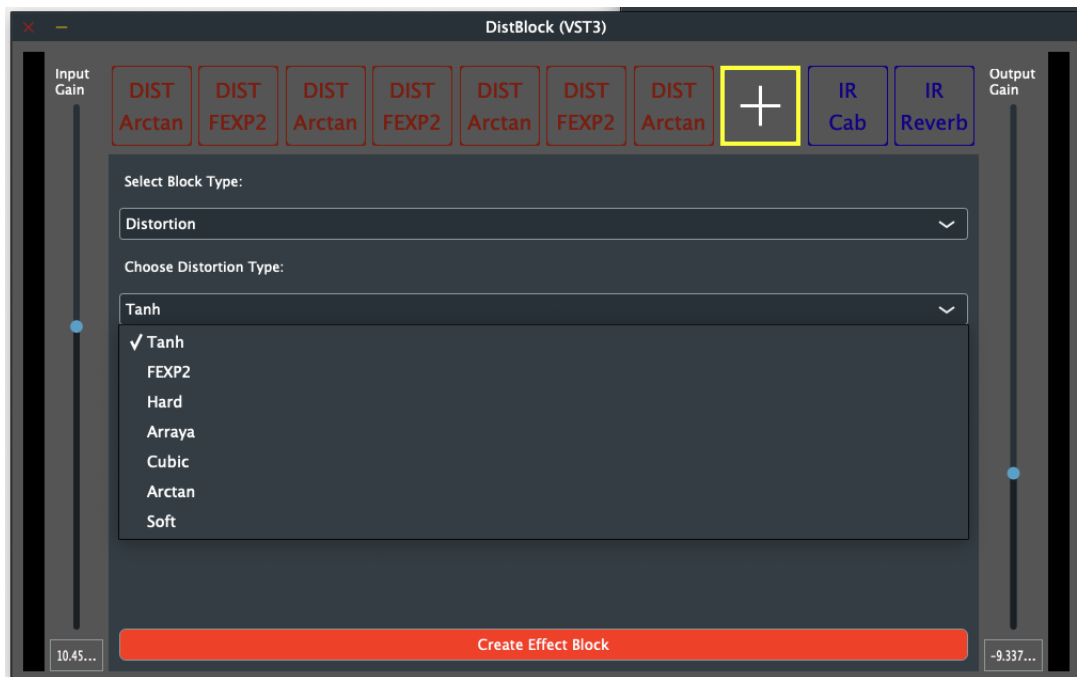


Figure 2: Distortion block type selection

### 2.2 Adjust Parameters

Click on any non-empty processing block to open the parameter adjustment panel. For a distortion block, you can tweak the mix, pre-gain, post-gain, low-

cut frequency, and high-cut frequency parameters. For an IR Loader, you can adjust the mix parameter. For any processing block, you can bypass or engage it to compare the results.

For more information about the implementation of the Distortion block and IR Loader block, you can refer to the content in the provided 'Presentation.pptx'.

## 2.3 Delete A Block

Click on any non-empty processing block to open the parameter adjustment panel. Click the 'Delete' button at the bottom to remove a processing block in real-time.

## 2.4 Warning

If you are adding multiple distortion blocks to your processing chain and increasing their pre-gain parameters, you should add a cab simulation IR block at the end of your processing chain; otherwise, you will hear a very harsh sound. The reason is that when you clip an audio wave, you are introducing many harmonics into your sound. As you stack multiple clipping blocks, more and more high frequencies are added to your sound. In real life, a guitar amplifier is connected to a guitar cabinet to produce the real sound for humans to hear. The frequency response of a cabinet is a complicated filter. In the high frequency range, it usually acts as a low-pass filter. Therefore, adding the cab simulation will make the sound more pleasant to listen to.

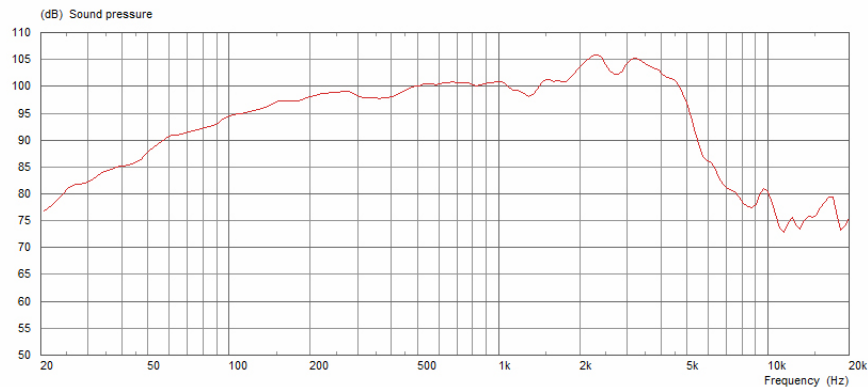


Figure 3: Frequency response of the classic V30 12 inch guitar speaker

## 2.5 Provided Resource IR Files

Under the './Resource' folder, I have provided two IR files for you to use: 'Cabinet\_IR.wav', which is the IR of a guitar cabinet, and 'Hall\_Reverb\_IR.wav', which is an IR of hall reverb.

## 3 Run the Code

### 3.1 Run the App

I have built the application and the vst on my Apple M1 MacBook. These files are under './Builds' folder. You can try to open the 'DistBlock.app' on your Mac to run the standalone application or you can copy the vst to the vst folder in your computer and load it in any DAW which supports the vst plugin type. However, I only have one MacBook here, I am not sure if you can successfully run the files I built.

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### 3.2 Build the app

If you can't run the files I built, you can try to build the app yourself on your own computer. The complete code is under the 'JUCE Project' folder. Since the project was developed using the JUCE framework, you will need to download the framework from their website. Open the project with 'DistBlock.jucer' found in the 'JUCE Project' folder, open the supported IDE from the projucer, and then build the application or the plugin on your computer.

### 3.3 Can't run it?

In case you can't run the files I built or are unable to build the project yourself, there are two screen recordings in the './Resource' folder. You can listen to the unprocessed sound by watching 'unprocessed.mov' and compare it with the processed sound from 'processed.mov'. In 'processed.mov', I have stacked seven distortion blocks along with one cabinet simulation block and one reverb block.