Dynamic Bass Processor

With the introduction of DCArt10.6 and DCForensics10.6, we've included a novel Dynamic Bass Processor. It can be used as a dynamic low frequency noise reduction system and/or as a dynamic bass enhancer. Here is a detailed description of the system. It can be previewed by downloading the demo of versions 10.6

Dynamic Bass Processor (Dyna Bass Processor)

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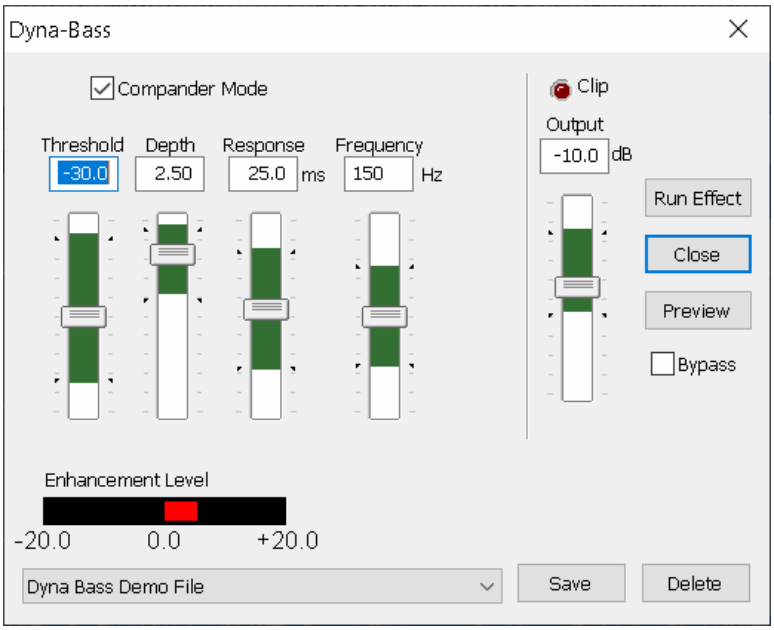
The Diamond Cut Productions Dyna-Bass Processor can be used either as a dynamic low frequency filter or as a bass dynamic enhancement system. Normally, bass frequencies can easily be accentuated or attenuated by using any of the various graphic or paragraphic equalizers. However, there are cases where low frequency random noise signals will also be amplified by those filter types when attempting to boost the bass or attenuate the low frequency noise. One such situation occurs when an audio source may contain a large degree of rumble from a turntable or from the master recording itself. Also, live recordings (especially those made with large diaphragm microphones) can pick up the random rumbling low frequency sounds of the HVAC (Heating, Ventilating and Air Conditioning) system which will be especially pronounced during quiet musical passages. Other low frequency sounds can get onto a recording from road noise, heavy machinery and general recording venue building noise. Oddly, these low HVAC frequency sounds are often not noticed during the recording process itself, but become apparent and dominant during playback after the fact. Using something like a hi-pass filter or equalizer can dramatically reduce these sounds or seismic events from the final recording at the expense of a loss of the legitimate low frequencies of the performance or source recording.

The Dyna-Bass processor can be used to attenuate low frequency noises (1/f noise) while maintaining the desired low frequencies on the recording. In other words, this processor can separate random noises from the actual important bass sounds. In this case, it can be viewed as a low frequency noise reduction filter, but because it is dynamic, it incrementally amplifies the low frequency bass signals when they fall above a certain user settable threshold value. Above the threshold value, both the random1/f noise plus the target good bass signal are passed to the output, with the good bass masking the noise signal. This process is provided by upward expansion of signals above the user set threshold value.

The Dyna-Bass processor can also be used to add "punch" to a bass line. This is accomplished by expanding the dynamic range of the signals below the frequency control setting when their amplitude exceeds the threshold control setting. Generally, this should be performed using the non ALC / Compander mode of operation (ALC unchecked). This can create a substantial noise reduced bass sound in some situations providing you with an expanded bass dynamic range and noise reduction at the same time. It should be noted that this effect can easily be over-done, so care should be used when adding "punch" to an audio restoration/enhancement using expansion alone. Alternatively, a less aggressive effect can be obtained with the ALC (Compander) mode turned on, which can be quite pleasing to the ear and easier to "tame". This mode upwardly expands the signal below the threshold and compresses it above the threshold setting. However, the greatest noise reduction effect is obtained in simple Expander mode (ALC box unchecked), but you need to be careful with the settings so as to avoid output overload. It is recommended that the "Output" control be set to a fairly low position when starting out and then bring it up slowly after you find the basic

settings of the primary controls that you find to be the most effective on your audio material. Additionally, the various control sliders all have "Green Zones" which show you (depending upon the chosen mode) which ranges (zones) will most likely give you reasonable results. This does not mean that you can't operate outside of those zones, but the highest probability of success will be found when the various controls are set within their green zone ranges. It is important to note that the best results will be obtained when previewing using an audio system that includes a sub-woofer.



The Dyna Bass Dialog Box

A good place to start is to use one of the factory provided descriptive presets. Click on the preset that seems to describe what you want to accomplish and then fine-tune it using the slider controls. After you are satisfied with the result, save that preset for your own future reference.

The Dyna Bass Processor Controls

Here are the various Dyna Bass Processor controls and what they do.

Threshold (in dB): This control determines what amplitude value at which the system becomes active. Its range is from 0 dB to -60 dB. Use it in conjunction with the bar graph and your hearing to find the active region for the processor.

Depth (relative units): This determines the degree of the effect imparted upon the audio signal. It ranges from 0.1 (minimum effect) to 4.99 (max effect). Use the Green Zones adjacent to the slider as a guide to obtain reasonable results.

Response (mSeconds): This control sets up the time constant for the system to react to signal envelope changes. It ranges from 5.0 mSec to 99.9 mSec. Small values produce fast transient response while high values produce slower responses.

Frequency (in Hertz): The range for the frequency control is 50 to 250 Hz. It determines the frequencies below which activate the bass dynamic processor. Lower frequency values yield a deeper bass sound while high frequencies yield a more nominal bass sound.

Output (relative dB units): The range for this control is +5.9 dB to -30 dB. This controls the overall output level of the dynamic bass processor. Since the processor tends to amplify the bass signal, it is a good idea to start with this control set to its lowest value. Use it in conjunction with the Red Clip Led to assure that no clipping occurs. If clipping is noted, lower the Output control down to a point where it is no longer flickering on.

Compander Mode: This selector box changes the mode of the processor from "Expander Only" to ALC/Expander (**A**utomatic **L**evel **C**ontrol). This mode provides you with a more "tame" behavior of the system, reducing extreme applications of the Dyna Bass effect.

Enhancement Level Bar Graph Indicator: The horizontal bar graph shows excursions when the effect is being invoked based on user settings. The bar graph moves in both directions depending on whether the system is expanding or compressing the audio. It's rage runs from -20 dB to +20 dB

Clip LED Indicator: This red clip LED is located above the Output control. When it lights, it indicates that they system is overloading and distorting. The Output control should be lowered to a point where this light no longer flickers on and off with the audio - - - it should always remain off for the best audio performance of the processor.

Preview Button: This allows you to hear what the processor will be doing to the signal without having to commit to a change in the source file. It operates in real time and allows you to experiment to find the best results for the material you are working with.

Bypass Button: This button allows you to compare the processed signal against the raw signal to help you decide the degree of effect that will provide the proper result when you finally "Run" the effect.

Progress/Cancel Dialog Box: When Previewing (or Running), a dialog box will appear in the lower left of your display. The bar graph shows the progress the processor is having on the file. When you are done previewing, you can cancel the preview via that feature by clicking on "cancel". When you ultimately decide to "Run" the processor, the bar graph will show how the system is progressing through the file.

Run Effect: After you establish the proper settings via the Preview function, click on "Run Effect" and your file will be imparted with the results of the Dynamic Bass Processor.

Close Button: When you are done with the Dynamic Bass Processor, clicking on the "close" button will shut down the processor dialog box so you can proceed to other processes.

Presets Bar: This is found along the bottom of the dialog box and contains numerous descriptive presets to help you get started with an audio problem using the Dynamic Bass Processor.

Save: To the right of the Presets Bar is a "Save" button. When you create your own desirable parameters, you can save them using a descriptive name for future reference.

Delete: To the right of the "Save" button is a "Delete" button. To delete a preset, bring it up and then click this button to eliminate it from the presets menu.

Note: A Dynamic Bass demo file is included so that you can experiment with this Processor. The demo file includes low frequency rumble as well as a simple bass line. A preset is available to clean up this file, but you can experiment with it to your own taste. The file is True Blue Lou, an electrically recorded lateral 78 mastered in 1929 and performed by Annette Hanaahaw.