

## QUICK-START – Cube-Tec DeCrackler for Pro Tools™



**DeCrackler** has been optimized to remove up to 8000 disturbances per second. The latest *adaptive algorithms* have been employed which significantly simplifying user operation.

The **DeCrackler** has four different detection algorithms -- **Standard**, **Complex Mode**, **Voice/Brass**, and **Noise Bursts**. Each algorithm lends itself to a specific crackle problem. In reality there are two main algorithms each with a variation. **Noise Bursts** is derived from **Complex Mode** and **Voice/Brass** is derived from **Standard**.

**Complex** has a more sophisticated analysis model. In **Complex Mode**, disturbances can be separated from the desired signal more accurately and they can be removed with few artifacts. **Complex Mode** should be used for very "fine" crackle -- for example, high frequency surface noise that sounds like granular hiss. As the crackle becomes coarser you should probably use one of the **Standard** modes. One note about the **Complex** algorithm; because of the more complicated analysis mechanism, it takes quite a bit more DSP than one of the **Standard** modes.

**Standard** has the widest range of uses - general surface crackle, lessening distortion components, high frequency buzz harmonics, etc. Optical film tracks should use this mode as well. The key is to assess the problem and then apply the appropriate tools in the appropriate order. In the case of optical film tracks, it is important to remove the larger transients first - especially those that have large low-frequency thumps - *before* the **DeCrackler** is applied. The **DeCrackler** can artifact if you're not careful about what program you are feeding it and what your threshold is relative to program.

Whereas **Standard** and **Complex** are generalized algorithms that will work on a wide range of program material, the **Voice/Brass** and **Noise Bursts** modes are 'specialty' algorithms.

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**Voice/Brass** facilitates the removal of clicks from signals with "voice or brass like" program. **Noise Bursts**, is an algorithm that removes longer lasting disturbances having smaller amplitudes. These lower level noise bursts are heard only after a 'first pass' de-crackling process on older recordings like shellac. This new algorithm simplifies noise burst removal.

The **Soft** and **Smooth** algorithms are the most current developments. They employ a more sophisticated interpolation algorithm and generally produce the best results for program requiring more processing. Its smoothing characteristics are superior for minimizing gritty distortion from over-modulation, severe groove wear and older format recordings – cylinder and wire media.

The **Smooth** is the default setting, and it's best to start there. **Smooth/Soft** can be used in situations where real-time *E-Type* interpolator might otherwise be used.

Once an algorithm is set, there are only two parameters required for manual operator control. The **Threshold** control sets the level at which the **DeCrackler** begins to operate. The Reduction parameter sets the amount of removed disturbances. An intuitive display monitors the real-time progress of the **DeCrackler**, displaying the number of disturbances removed at various click durations. This display is actually a statistical graph, showing a distribution curve of click durations (from 1 to 30 samples in width) versus the numbers of clicks per second. This display is useful to see if the **DeCrackler** is working with click widths that really ought to be taken care of by another tool; for example, if there is a lot of activity in the 20 to 30 sample width region, then you probably should have the **DeScratcher** inserted *before* the **DeCrackler**.

An **Audition** mode allows the operator to listen to the removed disturbances in real-time – even while parameters are adjusted -- very useful indeed.

Finally, an **Auto** function, begins an 'auto-scan' of the **Threshold** fader, to determine the best 'nominal' setting. This will give you a generalized starting point -- by using the **Audition** mode and changing the **Threshold** to better suit the program material, you will optimize this initial setting to maximize crackle removal with a minimum of artifacting.

**DeCrackler** is often used with the **DeScratcher**. In all cases, **DeCrackler** should be inserted *after* the **DeScratcher**. You always want to remove the larger clicks before the smaller ones. It's often advisable to use multiple **DeCrackler**'s in series; by setting different parameters - even different algorithms - on each instance, you 'pee-off' layers of small clicks and grunge.

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