

AddLTEDistortion

Contents

AddLTEDistortion is supplied as a zip file, addlitedistortion.zip. When unzipped it should contain:

```
AddLTEDistortion.exe
filter1.dat
filter2.dat
filter3.dat
filter4.dat
CT_Pro.dll
```

and this information file.

Description

AddLTEDistortion processes a 16-bit/44.1kHz stereo Wave file to simulate the effect of lateral tracking error distortion in vinyl disc replay.

System requirements

AddLTEDistortion should run under any Windows 32-bit operating system, from Windows 95 onwards. It has been tested on Windows NT4 and Windows XP Pro.

To run, AddLTEDistortion requires that the supplied CT_Pro.dll be installed in the same directory as the executable. This file contains the runtime files of Perfect Sync Inc's Console Tools Pro (<http://perfectsync.com>) which provides enhanced control over the console window's appearance and function. The four files containing filter coefficients (filter*.dat) must also be in the same directory (folder).

The AddLTEDistortion console window is sized for use with screen resolutions of 1024×768 or greater. If you attempt to use it with lower screen resolution you may have to navigate the console window via scroll bars.

Operation

AddLTEDistortion first asks you to specify the file to be processed. This must be a stereo Wave file of 16-bit resolution and 44.1kHz sampling rate in PCM format (eg as ripped from a CD), and must not have a duration of longer than 10 seconds. If any of these requirements is not met, an error message is generated. If the requirements are met, the file's key parameters are displayed.

AddLTEDistortion then requests the disc parameters for the lateral tracking error distortion simulation: disc rotational speed (you must respond either '33' or '45'); groove radius in millimetres; full-scale lateral groove amplitude in millimetres; and lateral tracking error in degrees. Of course, the figures specified for these parameters should reflect likely operating conditions. For example, the lateral tracking error of an optimally aligned 9-inch arm is about 1 degree at a groove radius of 58mm, assuming a modulated groove area of 58 to 146mm radius. The lateral tracking error distortion generated under these conditions is at a maximum, so these are appropriate figures to use. The maximum lateral groove amplitude on LP is typically 0.05mm, which corresponds to a recorded velocity of 22.2cm/sec RMS at 1kHz. If you specify a higher amplitude than this you should be aware that it is likely to be encountered infrequently in practice, and may cause more distortion through cartridge mistracking than lateral tracking error. Lastly, AddLTEDistortion asks for the name of the output file before beginning to process the input file.

Note that as AddLTEDistortion upsamples the input data by a factor of 144 times, it makes significant demands of the computer's memory. If the input file is small enough and the available RAM large enough, then the processing will be conducted in electronic memory. If the RAM capacity is insufficient, virtual (hard disk) memory will be required and the processing will proceed more slowly as a result.

For the purpose of listening comparisons, it is recommended that you generate a reference file by specifying a lateral tracking error of 0 degrees, and use this as the yardstick by which to judge the audibility of lateral tracking error distortion in files where the tracking error is specified as non-zero. This ensures that the reference file has been subjected to exactly the same filtering, upsampling and redithering processes.

You should avoid choosing source material with a high level of high frequency content as some of the distortion products generated by AddLTEDistortion will then be aliased, which may lead to incorrect conclusions being drawn about the audibility of distortion due to lateral tracking error. This aliasing occurs because the 44.1kHz output file is generated directly from the 144x upsampled and processed data, without the application of anti-alias filtering. With careful choice of source material this is not a problem but if you would like me to write a failsafe, non-aliasing v2 of AddLTEDistortion, you should petition me via freeware@audiosignal.co.uk. If enough people express an interest I'll make the necessary additions to the code.

Licence

This software may be freely distributed provided that it is unaltered and distributed in its entirety, including the supplied DLL and this information file. No support or warranty is implied or given but if you encounter any bugs or have suggestions for improvements you are invited to post them via www.audiosignal.co.uk.

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