Diamond Cut Productions, Inc. **Application Notes AN11**

Proper Use of Stereo Phono Cartridges to transfer Lateral and Vertical Cut Records

A common technique that we have seen that's used to transfer Lateral or Vertical 78 or 80 RPM Records involves wiring a stereo phono cartridge's two coils in series or anti-series. This leaves two connections that are fed to the pre-amplifier magnetic phono input. In other words, the technique involves connecting the resulting pair of conductors (co-axial shield on one side and center conductor to the other side) to a magnetic phono pre-amplifier. People who use this improper technique wire the stereo cartridge in direct series (+ connection of one channel to the - connection of the opposite channel) for lateral transfers (and besides lateral 78s this also includes early LPs and 45s). For vertical cut (Hill and Dale) recordings (like Edison Diamond Discs or Pathe') they wire the coils in anti-series (- connection of one coil to the - connection of the opposite coil, and the output signal is derived between the two + terminals of the pair of coils).

So, what is the purpose of this Application Note? It is to point out that this technique is not the correct way to handle these situations for adapting a stereo cartridge for monophonic transfers of lateral or vertical modulated records. The problem with this technique involves one primary issue and a secondary issue too.

Stereo phono cartridges are designed to operate each coil (or channel) into a manufacturer specified termination resistance at the pre-amplifier (usually 47,000 Ohms on each of the two inputs). Note that we said EACH coil should be properly terminated, not both coils wired in series terminated with a single 47,000 Ohm resistor {in the pre-amplifier}. What is the significance of this termination resistance value requirement? It involves the proper dampening of the dynamic performance of the cartridge and pre-amplifier analog interface. Terminating with a resistance value that is too high will under-dampen the system and terminating with a resistance that is lower than the specified value will produce an over-dampened response. Under-dampened cartridges will sound more "shrill" while over-dampened cartridges will sound dull on the top-end of the audio spectrum. If you wire them in series and plug them into once channel of a standard Magnetic Phono pre-amplifier, and since most magnetic phono preamps are equipped with 47,000 Ohms, the coils of the stereo cartridge will not be properly terminated, yielding an improper dampening performance of the system. Secondarily, the inductance of one coil will modify the total output impedance of the cartridge system (two impedances are in series), causing issues with the frequency response of the system.

So, what is the correct method to transfer these monophonic phonograph recordings to your computer? It is very simple. Just use the stereo phono cartridge as it was designed to be used; do not change the head-shell wiring, but keep both channel coils as stereo signals into the stereo input of your magnetic phono preamp input. Transfer all records in "stereo" (actually, it is not stereo, but dual channel mono {discrete left and right wall signals}). That way, both cartridge coils are properly terminated with 47,000 Ohms. Also, since the coils are not wired in series, the output impedance of the cartridge will be the proper value as opposed to a summed together complex impedance that results from hard-wiring the coils.

So now you will ask: "how do I extract the lateral or vertical signal from this type of transfer"?

It's simple...

Use the Diamond Cut Productions File Conversion Filter (Filter Menu). For conversion of the pair of signals from a lateral cut record, use Stereo to Mono (L+R). For conversion of the pair of signals from a vertical cut record, use Stereo to Mono (L-R).

This will yield dramatically superior results in your transfers of monophonic records because the phono cartridge is being used in the manner consistent with how it was designed and prescribed by the phono cartridge manufacturer.