

# Technics service

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## Why you must never 'internally ground' your turntables.

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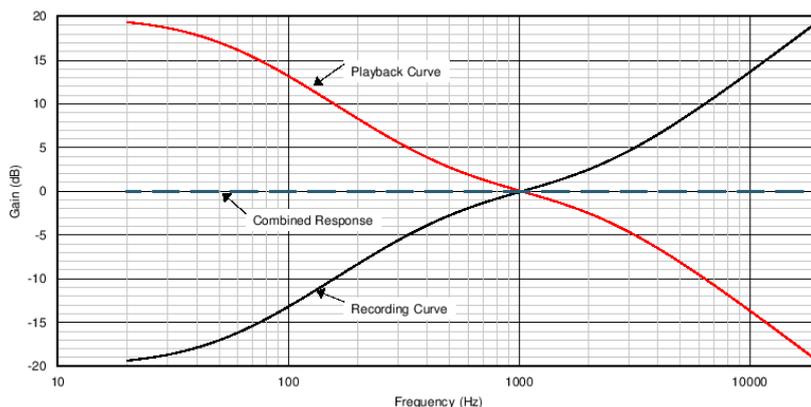
### Intro:

There has been increasing popularity lately regarding 'internally grounding' where people have removed the separate earth from a Technics turntable and joined it to one or both audio shields. This seems to remove the need to have the separate ground cable as the signal is commoned with the audio shield which is often connected to the preamplifier (mixer) chassis. The following information will give a very brief outline as to why Technics put the separate ground there in the first place, and why you must always keep it separate. I say very brief outline because the electrical and electronic theory can go very deep into explaining this.

### Reasons:

**1) Keeping the chassis ground separate.** You will notice on your cartridge pins that they are often labelled as L+ (white), L-(blue), R+(red) and R-(green, sometimes brown). This is because the electrical coils provide in effect what's called a 'balanced' signal, and any noise/static which is joined to this will be induced into this signal line before it reaches the mixer. The reason being is that the tonearm signals are very tiny compared to line level, and are far more sensitive to such interference. The motor PCB is connected to ground underneath the platter, this is what must be referenced separately to the audio signal ground.

**2) Cross capacitance.** Take a look at the following diagram :-



This is called the RIAA curve, and is used when recording onto vinyl. The reason being, if it were normal flat frequency response then you would have very fat grooves for the lower bass frequencies, so this is reduced, and then re-booster inside the pre-amplifier (mixer). Internally grounding creates a capacitance effect with the tonearm outer shell, which becomes a high pass filter, thus filtering the higher frequencies to ground. This is made even worse when using moving coil cartridges. This in effect alters the RIAA curve and makes your music sound more dull/muddy. In addition (worth noting) - Pioneer mixers also do not provide the correct RIAA equalisation at the best of times, let alone as to whether a turntable is internally grounded or not. They also give a terrible boost at around 70Hz which creates feedback. The only place to common the audio and chassis is the equipment that holds the RIAA pre-amplifier.

Continued on Page 2.

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## Why you must never 'internally ground' your turntables (continued).

**3) Topology (Inductance):** The topology of a Technics SL turntable makes it a class 2 electrical appliance, and as such the chassis ground must ensure that any residual current is fed to another chassis and must not be carried through the audio cable of which the screen is purely functional, especially as some mixers isolate the audio ground from the chassis. You will also find that there is risk of interference as internal grounding will in effect turn the chassis into a large antenna, attracting RF interference down the audio and inducing in the centre cores of the leads bypassing any RF filtering. Knowing the difference between grounding, bonding and earthing gives a better picture in all of this, and there are safety aspects too.

Where the motor PCB is grounded to chassis, this means that all of the electrical signals induced by the motor operation (there are quite a few) are distributed to chassis and this along the separate ground wire. You don't want that surrounding the audio signal cable.

Internal grounding reduces the S/N ratio right down to around 10-15dB which is extremely poor.

**4) DVS Software:** People often say that when using Serato and other DVS software that they haven't had any problems. But you must remember – The software was made to be used on turntables. Turntables were never made to be used with software and as such must be kept original. There have been many cases where people have had issues especially with unearthed (pioneer) mixers.

**5) 'Professional' modifications:** There is no such thing as a 'professional' internal grounding modification regardless of whoever provides the service, even by well known customisation companies. Many people have had issues but that's not what they will tell you. There are even tonearm printed circuit boards available online which include internal grounding. Anyone providing internal grounding products or modifications will not have a clear understanding of electrical and electronic theory and should not be offering turntable servicing. Beware of people who use 'blag-talking' sales techniques, sandwich statements and all other methods to get you to believe otherwise.

Again there are many more reasons which can get very technical, which is why the ground wire was added by Technics in the first place. Plus internal grounding will reduce the value of your turntables, so keep them original.

I re-instate the original ground free of charge as part of a normal service so if you have had them internally grounded then rest assured I will put them back to how they should be. Head over to [www.technics-service.co.uk](http://www.technics-service.co.uk) to book your turntables in.

Information submitted by:

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