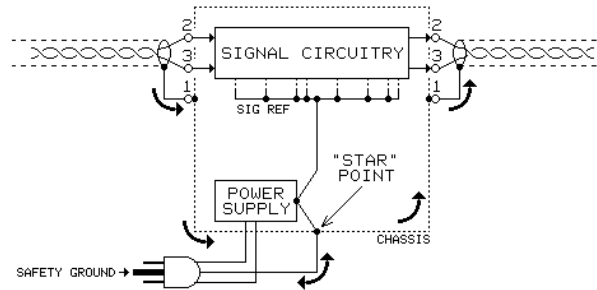


Proper Internal Grounding Avoids Ground Noise Coupling (aka "Pin 1 Problems"*)

When equipment is connected into a system, noisy currents flow in shield conductors. It is very important that these currents NOT be allowed to flow in signal reference grounds. They should be allowed to flow ONLY to the power line safety ground by the most direct route possible. Additional noise currents, capacitively coupled through the power supply's transformer, will flow from ANY power supply outputs to power line safety ground. Like shield currents, they must NOT be allowed to flow in signal reference grounds.

If any of these currents flow in signal reference ground, they can produce hum and buzz (and other, more subtle symptoms) in the audio signal. This problem is described as common impedance coupling.



These problems can easily be avoided by what is known as "star grounding". Since safety regulations require that safety ground (the green wire) of the power cord be bonded to the chassis, it is very convenient to use this point as the "star" point, as shown above. The power supply "commons" or "grounds" are connected to this point. If input and output shields are connected directly to the chassis (also good for RF suppression) they are effectively tied to the "star" as well. This results in no significant common impedance coupling of noise into signal ground.

* Note: The term "Pin 1 Problems" was first coined by Mr. Neil Muncy in his June 1995 AES Paper Titled "Noise Susceptibility in Analog and Digital Signal Processing Systems"

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