

Three Aspects of Preamp Design

There are three main aspects of preamp design. Although I'm working on and guitar and instrument designs, they actually apply to virtually all situations. They are:

1. Input impedance
2. Output impedance
3. Gain

Input impedance

This is about how much your preamp loads your pickup. Humbucker pickups put out a strong signal while piezo pickups put out a fairly weak signal. Older Dean Markley sound hole pickups aren't very strong either. And high input impedance provides a lighter load to the pickups and make piezo pickups sound better.

Output impedance

This is about how well your preamp can drive the signal thru your cable. In general, the lower the output impedance the better the signal will be when it reaches your amp or the PA. Also preamps will have a more resistive output which helps level out the frequency response effects of the cable.

Gain

Gain is about how much your preamp increases the signal going thru it. Sometimes you don't need extra gain if a high input impedance and a low output impedance provides what you need. If the signal from the instrument is pretty weak, then more gain is needed to make it sound good.

Other things

There are many other but lesser considerations when designing preamps. Usually I design for a clean signal but sometimes a 'dirty' signal is wanted and the design can be adjusted for that. Frequency response can be adjust as needed also.