

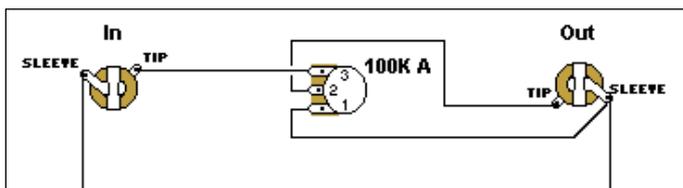
Attenuators: Volume Attenuators vs Power Attenuators

Firstly, and let's get this straight, the two are not the same thing. Although some Volume Attenuator makers who sell on Ebay, let you think they could be! So buyer beware!

Let's deal with **Volume Attenuators** first. These are simple boxes with an input jack, an output jack and a VOLUME control installed. They are designed exclusively to connect to the amp's FX LOOP, if it has one... not between your guitar and amp input; and most definitely NOT between the amp and speaker! If your amp does not have an FX Loop, then you cannot employ one of these boxes... end of story for you!



Now, what I must say at this point is that these *Volume Attenuators* are NOT designed to give power amp/tube distortion. Because they are installed into the FX Loop, they regulate the amplitude of the signal driving the power amp. So reducing the amplitude of a signal prior to the power amp stage will reduce the amount of power amp distortion the amp can produce. So don't make the mistake of buying one for this purpose... you'd be wasting your dosh!



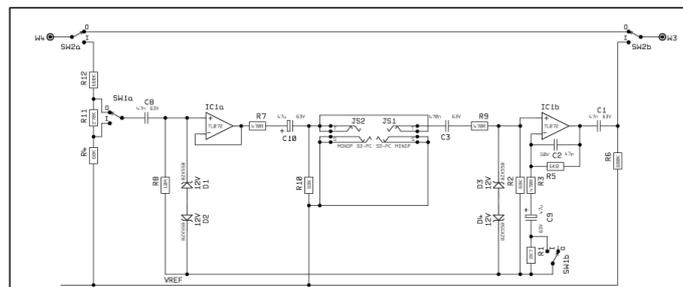
Above is a typical circuit for one of these boxes that you might find on the Internet. The value of the pot (variable resistor or Volume control) is shown as a 100k. But you can find them ranging from 10k to 1M ohms.

How will it help me? Their purpose is to *tame* an amp where its own built in Master Volume knob is very touchy and is at nearly full volume when it's set to only 1 on the dial. There are many amps like this and it annoys owners no end, because they cannot play at low levels at home or at smaller gigs. So, this Volume Attenuator box *ONLY* enables the amp user to drive the preamp tubes harder to produce a lot, some or perhaps hardly any preamp distortion... depending on how much gain there is in the amp's preamp stage. There's not a way to predict this until you try it out with your own amp! However, most modern amps do have at least two channels. One for clean playing and one for distortion. In this case the Volume Attenuator could be a very useful asset indeed if, as I pointed out earlier, that your amp has one of those hyper-sensitive Master Volume controls that shred your neighbours ears when set to only 1 or 2 on the dial.

How well will it work? Well, that depends on the design of your amplifier, NOT the Volume Attenuator box. Ideally, your amplifier will have a SOLID STATE driven FX Loop. Why? Because ONLY SS FX Loops can provide a very low output impedance to drive almost any studio quality effects processor available, which usually have an input impedance as low as 10k ohms. An all tube amp with a tube FX Loop, would NOT be able to cope with these processors at all. In fact, I have not yet met a boutique amp featuring a tube driven FX Loop that worked hardly at all! This is why the better makes of tube amp have resorted to SS FX Loop drivers. It's not cheating or trying to reduce costs... they just work far better than valves do at this particular job.

Quite often, when a passive box like this is installed into an all tube amp and the tone and volume are compromised by impedance mismatch, it's usually the box that gets the blame! I often hear: "Well, I have an XYZ123 'all toooob' \$3000 master amp as used by Sid 'Shredder' Whoever, so it can't be the amp!" Well, no actually... that comment is plain wrong. It's the XYZ123 that's at fault because it has a less than adequate *tooob* FX Loop. Fact, regardless of how much the amp cost you!

Please... try not to let 'forum chat' from self appointed and untrained electronics 'quacks' lead you to believe that "...only tubes can guarantee the level of purity and harmonic richness that every player lusts after". That would be completely untrue in the case of FX Loops.



A typical circuit for a 'decent' SS FX Loop that will give excellent performance with almost any effects units

I think this pretty much covers the **Volume Attenuator** topic.

Now to **Power Attenuators**. These are a completely different animal to the unit we've just been discussing. They plug in between the speaker and amplifier's speaker output jack. The point being, that when you turn up the volume of the amp to enable the amp to create natural power tube distortion, then you can use the Power Attenuator to reduce the loudness to a reasonable level before blasting your audience or neighbours off the planet!

The first Power Attenuator that I encountered was back in 1984 made by **Tom Scholtz**, guitarist with Boston, called a **Power Soak**. Tom is also a clever electronics designer and created the famous stereo **Rockman** guitar preamp of that era too. If you want to know more about his achievements, then you can Google him.



The Power Soak was simply a bunch of high power resistors and a switch that would allow the user to select pre-set loudness levels but always maintaining the correct impedance matching/loading on the amplifier, whilst at the same time, bleeding off a small amount of power to the speaker(s). All done with complete safety to the amp. So basically, you could have power tube distortion tone at any volume. At least that was the theory.

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There have been many since then... Hotplate, Power Break, the list goes on. Some are a lot more sophisticated than the old Power Soak and employ reactive loads to simulate the kind of loading a real speaker does, with various degrees of success.

For me, these devices are a little extreme, but many players claim very good results. However, they cannot ever give you the exact tone of an amp directly coupled to the speaker and cranked to full volume. There are a number of reasons why and I shall attempt to explain them.

1. The output tubes, output transformer and various power supply components are placed under extreme stress and, as a result, can seriously shorten their life expectancy.

2. Pure resistor based power attenuators, like the Power Soak, do not present the amplifier with a reactive load and the signal across the load is rather 'square' when distorted. Thereby, the tone heard from the speaker would not be very representative of an inductive speaker load. The tone is more like an economy fuzz box. At least, that's what I have found.

3. The speaker is never in 100% contact with the output transformer (OPTX), therefore, the high impedance properties of the OPTX does not allow the speaker to generate electromechanically induced harmonics fully. Speakers operating at low volume reduces them too. (See my topic on speakers to understand more about this important contribution to, so called, tube amp tone.)

4. Psycho-acoustic effects play tricks in the mind of the player. This is due to the fact that our hearing is **very sensitive** to a very narrow band of frequencies when we listen to sounds at low volumes. As the volume of any sound increases, our hearing becomes more responsive to high and low frequencies. This is why any music sounds better when we turn up the volume of a radio when a favourite song is playing.

Because of this, mainly the nasty mids and lower treble elements in the sound are exposed and sound tinny or harsh. Resultantly, a fully cranked amp driven to near destruction and heard via a Power Attenuator, can NEVER sound as good as it does when the power attenuator is not inserted! Best audio excitement and widest frequency band hearing is achieved at nearly hurting point, 120dB. This was all researched in 1933 by the two scientists, Fletcher & Munson, and their work is a reference for all involved with audio. Google them for more information. The graph opposite is based on the work of Fletcher & Munson.

Conclusion. Until anyone devises a way of re-programming the human hearing, there will never be an answer to this problem. So my attitude is that Power Attenuators are not for me. But as I said before, many find them quite acceptable... and probably don't mind facing the amp servicing bills associated with using them in order to find a unique 'trademark' guitar sound.

After reading several guitar and amp forum posts, at the time of writing this, guitarists seem not so impressed by these devices generally. Complaints are as I would expect... that they are not convincing enough at very low levels of loudness. But my job is to merely point out the pros and cons of guitar related gear. The rest is up to you and you could well find they produce a satisfying sound for your own needs. ●

The author in no way, endorses or recommends any of the products featured in this publication and has no affiliation with the brands mentioned for reference purposes.

Here are some examples of the many Power Attenuators available on the market today.



Below is a graph showing how the human hearing changes with volume

