Re: Tone controls

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From: Jerry Greenberg (*jerryg50_at_hotmail.com*)
Date: 08/11/04

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I cannot tell you details about the particular design of your tone control unit, but as for the input impedance being at 1 meg−ohm (500 k−ohm minimum), I would use a 1 meg audio taper pot as a volume control. Using a 20K pot in the input of your amplifier is too low a resistance, and is acting as a load rather than something transparent to control the volume level.

The source impedance would not be a factor here, as long as it is less than 1/7 of the load impedance, as it should be. Idealy it should be about 1/10.

As for the input switching, using active circuitry only adds more circuitry in the path, and adds to the losses, distortion. In very high end audio, the less that there is in the path of the signal, the better it is for the quality of the sound.

For the input switching, I would use a very good quality mechanical selector switch for the audio inputs. My preference would be the type of rotary or step switch would be something like the ones used for band selection in high end RF communications equipment would be ideal. These are built on a bakelite, or porceline construction with gold plated or with non−oxidizing silver−alloy base contacts. These switches are of very low stray capacitance, and have very low loss. This is critical for RF work.

The switch can be thinly coated with a silicon type contact cleaner. This will help to prevent any type of oxidization that may take place, and maintain good contact.

All cables, including the under chasis wiring to and from the pots and switches should be of the proper shielded type wiring. This would keep the noise factors down.

As for the details of your tone control circuits, I would have to know more about it, and their particular design.

I myself don't believe in tone controls for high end audio equipment. Simple boosting and cutting the frequenies in the audio signal,

introduces phase changes, and thus modifies the accuracy of the sound.

I do believe in using a parametric equilizer system between the pre−amp output and the power amp stage to equilize for the environment effect on the sound. The parametric equilizer must be one that can control the sound without introducing more than a few percentage points in the phase accuracy at any extreme settings. This makes it fairly complex in its internal design. This setup would have to be calibrated using acoustic audio measuring equipment, located at the sweet point of where the listener will be sitting.

This is the approach I would start with.

Jerry G.
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Little Monster <root@localhost.localdomain> wrote in message news:<pan.2002.02.17.18.36.24.943366@localhost.localdomain>...
> Hello all,
>
> Not done any electronics for a while so rusty!
>
> I am building an external (Baxandall) tone stack, with switched inputs,
> to go with a Leak Stereo 20 valve amp I restored some time ago. The
> inputs will be for radio, tape etc. At the moment the radio (the only
> thing I have to connect to it) is fed across a 20k dual log pot, with the
> wipers connected to the amp's inputs, which makes a not−quite−satisfactory
> volume control (I guessed the radio's output would be 20k). Neither the
> amp nor the radio have their own vol etc controls. There will also be an
> output to connect to a tape deck record input, or to the 'puter's line in.
>
> Mainly I need to know about impedances. I realise the amp has 1M inputs,
> but what I would like to know, is what is the standard output impedance
> for transistor hi−fi separates (the case in question being a 70's model of
> Realistic turner). I assume it is some kind of standard.
>
> Next question, there will have to be some kind of impedance matching
> circuit inside the tone box, with a bit of gain to compensate for the
> insertion loss. What is the best way to implement this?
>
> Also, are there any 3 knob (ie bass, mid, treble) Baxandall circuits out
> there? I haven't seen any on the 'net.
>
> Final question (probably) I've designed a small logic circuit to provide
> soft switching between the 4 inputs. I think the best (or at least
> simplest) way is to couple its outputs (buffered) to the emitters of some
> npn transistors connected in the path of the inputs, so they can allow the
> signal through when that particular output is low. Apart from hard
> switching, is there a better way to do this? If I use this arrangement,
> is it also my best option for Z matching?
>

> *Thanks in advance,*
> *Monster*