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Subject: Sallen-Key filters and crossovers

Posted by [Wayne Parham](#) on Sun, 18 Aug 2002 23:23:36 GMT

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We put labels on things, really just to discuss them. But the fact is that, from an engineering perspective, there are a lot of different circuit topologies. They are formed from capacitors, inductors, resistors and from active components of various types. So there is a lot of detail we could look at in addition to the groupings of "active or "passive." Generally speaking, what reactive components do is to act as filters. Capacitance passes current before developing voltage across itself. This also has the characteristic of presenting less impedance to high frequencies than to low frequencies. Inductance is the opposite, developing voltage across itself before allowing current to pass, and posing less impedance for low frequencies than to high. Resistance is neutral, having current and voltage rise at the same rate, and having the same impedance regardless of frequency. Amplifiers are essentially just signal multipliers. You can put them in front of a filter or behind one, and the situation is basically the same. Of course, in the case of loudspeakers, the load is reactive too so the reactive components in the crossover interact with it. This is a situation that merits some investigation, and it is one of the main reasons that having the crossover before the amp is attractive. There is also several cases where reactive components are used within signal multiplier circuits, and more complicated response curves can be formed. A passive filter can only form a fairly simple response curve, but using feedback within an active circuit allows for more variations. This is why there are a lot of configurations that are possible, all of which are grouped together as "active filters." The Sallen-key filter is very versatile, and is worth studying:

Discussions about Sallen-Key filters and crossovers

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