

Amp/Speaker Fusing

Q. *I have a 35-watt receiver with 3.3-amp fuses in each channel. My speaker manufacturer recommends 1-amp slow-blows in the speaker line, which I understand will pass about 400 watts for 1 second. Would it be safe to change the 3.3-amp fuses in the receiver to the 1-amp slow-blows recommended for my speakers? Will they still protect my output transistors from damage in case of disaster?*

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A. Your question is much more complicated than it appears. First of all, are you sure that the 3.3-amp fuses in your amplifier are actually installed *in series* with the speaker-output terminals? There's a good chance that, although your amplifier's internal fusing arrangement serves indirectly to protect your speakers against problems originating within the amplifier circuitry, those fuses are *not* intended to protect the speakers against excessive drive signals. Therefore, it's best to follow the speaker manufacturer's recommendations regarding external fuses, even if there is a possibility of redundancy. Since the fuse with the lowest current rating will always blow first *if* both are of the same slow-blow type, double fusing (if that's what the hookup turns out to be) will do no harm.

Note: speaker engineers as a group hold the opinion that speaker-fuse values should be
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chosen so that, whenever possible, the fuse gives out *before* the speaker voice coil. The trick, however, is to choose fuses that will not blow out on very loud “normal” program material but will nevertheless protect the various drivers in a system—all of which have different damage points.

Ohm’s Law is of little help in determining the proper fuse value for a speaker. Unfortunately, trial-and-error testing with a variety of pulsed, pink, and clipped audio signals is needed to arrive at optimum and practical fuse values. The fuse’s response time and current rating are juggled to find the type and value that will protect the most fragile member of the system’s driver complement without blowing out on loud material.

Incidentally, speaker manufacturers report that the majority of voice coils are burnt out by overdriven *underpowered* amplifiers (which provide a destructive clipped signal to the speakers) rather than by super-power amplifiers played loudly.