



# Tech Made Simple

## CLASS I (BCA)

### So what is Class I?

Class I or BCA (Balanced Current Amplifier) is Crown's patented, cutting-edge technology that gets more power out of an amplifier with less wasted power than was ever before possible. It's a switching power amplifier design that is totally original.

### Which Crown amps use Class I technology?

K series, CE 4000, CTs 2000 and CTs 3000.

### What are the features of Class I? And how do they benefit me?

- A BCA amp generates one-tenth the heat of conventional amplifiers. So it can work with much less air movement. This reduces fan noise, filter maintenance, and contamination of the unit in normal use. In addition, the amp is more reliable because it is not subjected to excessive heat.
- A BCA amp with fans can use smaller heatsinks, making the amp smaller and lighter (as in the CTs 2000 and 3000).
- A BCA amp handles reactive (inductive) speaker loads easily and gracefully. It re-uses the energy returned from the speaker rather than dissipating it as heat or forcing the amp into premature current-limiting. This ability makes BCA models extremely resilient - especially at low, 2-ohm impedances. You can attach 2-ohm loads without worrying whether the amp will overheat and shut down - it won't!
- BCA has a very high effective switching frequency which allows the use of lowpass filters with almost no phase shift in the audio band. Result: better sound.
- High efficiency: High power output to the speakers, low power requirement from the wall outlet. Since the amp needs only a little AC power to operate, you'll have smaller AC power bills over the life of the amplifier. And you can plug several BCA-type amps into a 20-amp circuit.

### What is efficiency?

Efficiency is output power divided by input power, where the output power is the power delivered to the speakers, and the input power is the power drawn from the AC mains. The highly efficient BCA amp draws very little power from the AC outlet.

### What kind of amplifier design is Class I (BCA)?

Class I (BCA) is a type of switch-mode power amplifier design. We think it's a particularly clever and unique implementation of a switch-mode amplifier.

### Is a switch-mode power amplifier the same as an amplifier with a switch-mode power supply?

No, they are two different things. A switch-mode power amplifier processes the signal; a switch-mode power supply processes the AC mains power. (The terms "Switch-mode" and "Switching" are used interchangeably.) A switching power amp is very efficient and produces little heat. A switching power supply reduces the weight and size of the amplifier. Some amplifiers, such as the CTs 2000 and 3000, have both.

### Would you repeat the benefits?

- Smooth, open highs with low phase shift.
- Much less air movement. This means less fan noise and less filter cleaning. The amp is less sensitive to dust, smoke, stage fog and spilled liquids.
- A Class I amp with fans can use smaller heatsinks, making the amp smaller and lighter (as in the CTs 2000 and 3000).
- Handles any load easily - even 2-ohm and reactive loads.
- Very reliable - unlikely to overheat.
- Lower AC power bills.
- More amps can be plugged into a single 20-amp AC circuit, reducing installation costs.

### WHERE TO LEARN MORE:

Go to the Crown website at <http://www.crownaudio.com>  
Once there, select Amps > Info & How To > BCA articles.

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