

## Powering Up Multiroom A/V

A quality distributed audio installation should include several optional forms of power management for multizone system protection and automation.

by Fred Harding

More homeowners today are having custom installation companies design multiple A/V systems with at least two amplifiers or receivers that serve a plethora of entertainment needs. However, as the complexity of these A/V subsystems increases, so do system-specific problems that can detract from the performance and longevity of the system's components. A typical installation might have a home theater receiver dedicated to the main television, with a second receiver set up to drive the rest of the home's speakers. This type of system is the simplest multizone system; certainly more elaborate systems can take advantage of the ideas discussed in the following article. The issue of power management addresses the idea of when to leave different multizone components on or off. In many systems, there are components dedicated to one zone or another, and additional components that are shared between the zones. By sharing these components, all zones have access to the same musical source.

Examples of dedicated components include a satellite receiver, an HDTV set-top box, a VCR and a DVD player. Shared components include the mega CD changer, an AM/FM tuner and hard disc storage devices.

### Protect Your Client's Equipment

The simplest form of power management for any system is no management at all. Leave the things on all the time, and tell your customer not to turn anything off, and the system will be available to do whatever you choose, whenever you choose.

However, Tod Brown of Cinematronics, a Rochester, N.Y.-based systems integrator, warns against this type of approach. "I think that leaving the equipment on all the time is doing your customer a great disservice," he says. "It does not offer real protection for the components, and it only shortens the lifespan of the equipment."

Most homeowners would also disagree with that type of approach. For starters, it's not very energy-efficient, and the perception is that the equipment will wear out quicker if it's left on all the time, as heat will build up in the cabinet, which will affect the lifespan of the electronics. Ultimately, the impression that you leave with the customer will not be favorable with the equipment always left on.

This is where power equipment comes in. In its simplest terms, power management enables the user who wants to listen to his or her system to have to turn on only one device and the rest of the system will know enough to follow.

### Obtaining Equipment Knowledge Is a Must

Effective power management requires the installer to understand the characteristics of each source component. When the unit is turned on and off and then back on again, does the unit return to the "on" status? This type of equipment is said to have a latching power supply. Try it with a CD player when a disc is playing; does walking over to the wall while the machine is spinning the disc, pulling the plug and plugging it back in return the unit to the power "on" state? Does the disc player start playing the disc over, or does it return to the song that was playing? Does it remember that it was playing a selection from a subject of discs?

If the machine returns to playing the beginning of the disc it was on, you can probably integrate that player into the system for a multizone application without fear. If the unit goes into a dormant mode, it will require that you program into a remote control or keypad the appropriate start command.

In the case of an AM/FM tuner, does it return to the last station it was on? Will it remember the preset radio stations that you have loaded into its memory? The same questions apply for a satellite receiver dedicated to house music. If the answer is yes, you've got a satisfactory device.

Dan Welch of Suffolk A/V in Eastern Long Island, N.Y., indicates another concern. "Oftentimes, customers will want to use existing equipment in a new system. This requires that you learn about how a device works, and trust that it will hold up in an installation," he says.

Once you understand the characteristics of the source components, power management becomes relatively straightforward. Most audio products feature a switched outlet on the back of their components. By plugging in an inexpensive power transformer, you can supply a voltage trigger signal to any number of outlet devices on the market. When the voltage-sensing outlet sees power, it switches on a 110V outlet; a quality surge suppressor plugged into that will feed power to the shared components (see diagram below).

Problems arise when there are two zones in the system and both want to have control over the power status on the shared components. For example, the CD player needs to be available to the house music and home theater systems. With the plan laid out in the previous paragraph, only one of the two zones will have power control over the system.

#### Overcoming Obstacles

These multizone power problems can be solved by several solutions. Some manufacturers offer multi-triggered outlet centers. These devices have a series of jacks; when voltage is applied to any of them, the outlets turn on. Shared components plug into the outlets and life is good.

If your brand of surge suppressor doesn't afford you this option, you cannot wire the transformers in parallel to trigger the voltage outlet. Doing so will cause one transformer to back feed down the line to the other, and the blue smoke carefully packaged inside each power supply will be released. You don't want this to happen. Simply obtain a voltage-blocking diode (specification number 1N-4003), and put it in series on the plus lead of the power transformer. Since diodes are directional, they need to be installed properly. Assuming the diode is installed correctly, it will only allow the voltage to flow one way. That will protect the transformers and ensure satisfactory triggering. Whichever one turns on will trip the trigger, and the last one off shuts down the system.

A word of caution should be mentioned here: Just because a surge protection manufacturer may offer a number of voltage triggers, it doesn't mean they're the right product for you. Check to make sure you are satisfied with what that manufacturer offers in terms of warranty, nature of the circuitry and other related matters.

Brown says it is imperative to make sure that the power regulation device fits your installation application. "We recently switched back to a brand of protectors, simply because of a very effective demonstration at CEDIA. A brand that we had been spec'ing for several years frankly offered no protection after the first strike. We couldn't afford that," he says.

Other applications for power management include products for the increasing number of multizone, multisource systems on the market. More of these systems offer a 12V trigger on the back side, so that when any zone turns on, the voltage appears, and when the last component turns off, the voltage turns off.

Using a system like that along with a dedicated theater system still requires the diode protection. In that case, cut the plus voltage lead in and install the diode in series, and the equipment will become protected. Failure to protect the equipment in this situation leads to removing the entire head end, which is costly, frustrating and unprofessional.

An additional consideration to take into account is how the multiple sources will be shared among the various components. Most installers use a simple “Y” adapter on both the left and right channels of the source devices. Oftentimes with two amplifiers in a system, this becomes a functional solution. The problem arises when the system has more than two amplifiers, or when the manufacturer of one or the other amplifier shunts inputs to ground when the device is turned off. This is not a spec sheet or owner’s manual situation. When the manufacturer’s amplifier shunts to ground, the system will sound great when both amps are on, but as soon as one turns off, the sound becomes wretched from the other amp.

If sound engineering practice is to be followed, the solution for that situation, and every situation, is to put a buffer amplifier in place for each source component. Essentially acting as a powered “Y” adapter, the buffer amp takes a single set of inputs and replicates it multiple times, depending on the manufacturer. [CE Pro]

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