

ELECTRONIC HOUSE

Green A/V Limits Phantom Power Load

This California home is shedding energy by automatically cutting power to its array of high-end electronics.

Jun. 19, 2009 — by [Steven Castle](#)

Most high-tech houses are cool when the electronics systems turn on, but the coolest part of this home is when the electronics turn off.

That's because when many of the electronic devices in this house are turned off, they're completely off—and don't draw the "phantom" or "vampire" loads of electricity that most home electronics systems use whenever they are plugged in. In this house alone, the phantom electricity load has been cut by a third, thanks to the use of energy-efficient electronics and automating them to power down completely.

For example, the audio and video components for the two media rooms and a whole-house audio system shut off completely when a Crestron home control system sends signals to Panamax power conditioners, which cut power to the components plugged into them. In addition, a primary Crestron touchpanel in the kitchen can put secondary Crestron touchpanels throughout the house in sleep mode, thereby saving more power. And when no one's in the house, power is cut to all the electronics.

"We simplified turning off the lighting controls and audio/video systems, and we sought out vampire loads and automated the elimination of those loads," says Gene Quisisem, systems designer for electronics installer SoundVision of Novato, CA.

Homeowner Frank Levinson can monitor the home's electricity use, as well as his family's water use, via an Agilewaves energy-monitoring system. He simply logs onto a secure web page, and his energy use is charted by hour, day, month or year. He can also see how much electricity is produced by the 12-kilowatt solar panel array on the home's roof, as well as how much hot water is made available by a solar thermal system.

"Frank is up at night watching the energy consumption of the house when people go to sleep, looking at the data, and seeing what he can do save more energy," says Quisisem.

Going Greener

Levinson had personal and professional reasons for going green in this 4,200-square-foot house overlooking the Golden Gate near San Francisco. It's clear when talking with him that he believes in



GOLD WINNER: Best Green Home

saving energy resources, and his venture capital business, Small World Group, invests in green technology companies. "I have a bunch of friends who put in solar systems and pat themselves on the back for it, but we wanted to do more than that," he says.

Frank and his wife, Monika, had the 1970s house on stilts gutted and loaded up on blown-in Air-Crete insulation to reduce heating costs. They added energy-efficient Low-E windows that insulate as well. The solar electric and solar thermal systems were added, and a gas furnace was swapped out for heat pumps.

The house was also wired for home control, lighting control and whole-house audio, plus two media rooms with surround-sound systems. The electronics pros at SoundVision were charged with making the electronics as efficient as possible.

"Frank really challenged us to find ways to shut things off," says Quisisem. "Initially, he wanted to turn everything [completely] off, without understanding that some of these devices have reboot times. The ReQuest digital media server, for example, can take 15 to 20 minutes to check the hard drive when it turns on, depending on how much you have stored on it. A satellite receiver with a DVR will take 10 minutes to come back when it's turned back on."

The original electronics system that SoundVision specified for the Levinsons' house would have used a whopping 4.5 kilowatts while idling, Quisisem says. That was unacceptable, so SoundVision set out to find the energy hogs and eliminate as many of them as possible. "We redesigned the system to make the most efficient use of the equipment we had," says SoundVision's engineering manager, Kevin Frye.

Out went a Panasonic keyphone system with voicemail and six cordless chargers that used a total of 360 watts of power, 24-7, according to Quisisem. And in went more efficient systems like AudioControl whole-house music amplifiers. The process was difficult, because, as Quisisem says, "We don't have a lot of awareness of how much power these devices actually consume in full use and in idle mode."

The total electricity used now while all electronics are idling, or in standby mode, is about 1,200 watts (1.2 kilowatts). When the two media rooms and secondary Crestron touchpanels are put into sleep mode, that number goes down to about 800 watts.

There are still improvements that could be made. Ironically, for all its processing power in helping to regulate these energy loads, the Crestron home control system is a large user of energy. Even when the audio/video systems and secondary touchpanels are put into sleep mode, Levinson can shave another 250 watts by flipping the circuit breaker for the Crestron system. Part of the problem, Quisisem says, is that the Crestron touchpanels require dedicated power supplies, and they aren't efficient in converting high-voltage AC power to the low-voltage DC required for their use. That means that much of the energy being drawn by the system is wasted.

See Them Save

A Lutron HomeWorks lighting control system also helps the Levinsons save energy by dimming lights and programming preset scenes so that only the lights needed for particular tasks come on. But Frank is going beyond that, replacing many of the traditional incandescent bulbs with dimmable compact fluorescent lamps (CFLs) and even higher-efficiency LEDs (light-emitting diodes). He says a lot of the home's 50-watt halogen lights are being replaced by 5-watt LEDs. These LEDs can't dim all the way down to 1 percent, but that's a compromise the Levinsons will gladly live with, as they're saving a lot of energy.

The Levinsons can see much of what they are using in electricity via the Agilewaves energy-

monitoring system. It's connected through an Ethernet network and viewed through a web interface by Frank. SoundVision is planning to display data on the Crestron touchpanels, though for now Quisisem says the web interface is more robust.

Sensors monitor the electrical, solar, solar thermal, and water systems and send that information to a data acquisition box, and a PC server maintains the database.

Frank can see when his nephews are in the downstairs apartment playing on the computer all night. And the monitoring capability has enabled him to identify problems with the system. For example, after the photovoltaic solar system was installed, he noticed irregularities with the data associated with it and realized that one of the inverters used to convert the DC power from the solar system to AC for the home's electrical use wasn't working properly. There would be no way to know that from simply reading a monthly utility bill.

For now, Frank can see that he's producing more energy from the solar system than he is using, though he plans to add a hot tub and a lap pool. That will use up more juice—and he's sure to know exactly how much.

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SOLAR SYSTEMS

SunPower 12-kW photovoltaic system with dual inverters

Heliodyne solar thermal system and Takagi tankless water heater

AUDIO/VIDEO SYSTEMS

Pioneer Elite KURO PRO-150FD 60-inch plasma

Mitsubishi PD-5065 50-inch plasma

Chief PDR-2042B articulating wall mount

Chief PDR-UB universal articulating wall mount

Sanus extension mount SA-VMB1B
Sanus low-profile plasma mount SA-VMPL2B
Audio Control Model 860 12-channel 60-watt amplifier/equalizer
Audio Control Model 1160 16-channel amplifier/equalizer
Axis 243SA video server
Denon AVR 3808 receiver
Denon AVR 4308ci receiver
Panasonic, Blu-ray DVD player with SD card slot
Panasonic Blu-ray player set up for multiregion DVDs (2)
ReQuest F2.400 250-GB music server
Velodyne 3000-Watt Dynamic sub amp (2)
Leon Speakers Hz616 center-channel speaker,
Leon Speakers PR606-60 Profile series on-wall speakers (2)
Leon Speakers HZ414-LCR left, right, center speaker for 50-inch plasma
SpeakerCraft Aim Wide 5 in-ceiling speakers (24)
Velodyne in-wall subs (2)
Active Thermal Management cooling system
Extron video switchers
Panamax MAX 7500-PRO power conditioner & voltage regulator
Panamax power conditioner with 20-amp circuit
Panamax Powermax 8 Series surge protector

CONTROL, NETWORKING & LIGHTING SYSTEMS

Crestron home control system
Lutron HomeWorks system
Netgear Ethernet switches

OTHER SYSTEMS

Channel Vision P-0921 2-door telephone entry system
Holovision intercom entry system

ACCESSORIES

Middle Atlantic racks
Pro-Series HDMI cable
Terk XM antenna
Tributaries Series 5 audio cables

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