

# Protect Your Equipment

*Fluctuations in voltage often are unavoidable, so take steps to minimize the impact*

*By Pam Blair*

**B**efore the advent of microprocessors, using electrical products was as simple as flipping an on/off switch. Small changes in power quality were hardly noticed. Sensitive to even momentary power fluctuations, today's electronics require clean, "glitch-free" power.

Microprocessors—tiny computer chips that allow equipment to be programmed to do more—are being used in a variety of equipment and appliances, including home entertainment systems, microwave ovens and coffee makers. Because microprocessors require precise, constant power to work properly, power quality is important to customers.

Impacts of power disruptions range from minor inconveniences in the home—for example, the need to reset the VCR—to damaged equipment and huge losses in revenue for businesses.

While power quality is important to the utilities that provide electricity, many voltage fluctuations are unavoidable. They are caused by normal daily activities both inside and outside the home.

Internal causes are faulty wiring, loose connections, poor grounding, and major appliances and large motors switching on and off.



External causes include accidents involving power poles, bad weather, birds and other animals contacting lines, neighbors using major power equipment and utility operations.

Like utility customers around the nation, consumers of Copper Valley Electric Association (CVEA) are responsible for protecting their equipment from power interruptions and power fluctuations.

## Dealing With Common Power Fluctuations

Power interruptions include both planned and accidental loss of power. An interruption could cause your appliances, lights and electronic equipment to trip off and your personal computer hard drive to "crash".

The most common fluctuations involve spikes, surges or transients—different terms to describe

a sudden increase in voltage—and brief voltage drops, which are known as sags.

Spikes and surges generally last a few milliseconds, but can cause serious damage to computers, VCRs and other sensitive electronic equipment.

Motorized appliances such as air conditioners and refrigerators are much more susceptible to adverse effects brought on by sags.

Planning ahead and using protective equipment is important. To minimize or prevent problems

associated with unexpected momentary power interruptions and fluctuations, the following suggestions are offered:

- Put your sensitive electronic equipment on a separate circuit. Your computer and microwave should not be on the same circuit as your refrigerator or air conditioner.
- Be a wise shopper. Buy equipment already protected from potential power problems. Some manufacturers provide backup power features in products. Check the equipment you are buying for a display carry-over feature or a battery backup. This eliminates blinking digital displays.
- Install plug-in surge suppressors. By redirecting energy associated with over-voltage, surge suppress-

sors can provide limited protection against high voltage spikes. Surge suppressors can be purchased at most hardware and electronic supply stores.

- During a storm—especially when outages already have occurred—turn off and unplug all unnecessary appliances or equipment, such as computers, televisions and air conditioners to avoid damage. When the power comes back on and is steady, with no fluctuations or momentary outages, gradually plug in appliances.

## Tips for Purchasing Equipment

Because prices and features vary, buying a surge suppressor can be confusing. Avoid making a choice based entirely on lowest cost. Ask the equipment manufacturer what type of suppressor is recommended, or consult your owner's manual.

When purchasing a surge suppressor—which is officially called a transient voltage surge suppressor (TVSS)—look for the following information:

- The Underwriters Laboratories (UL) 1449 seal. This indicates the product meets minimum safety and effectiveness standards.
- Low-clamping voltage. This is the level at which the suppressor “kicks in” to minimize a power surge. Make sure the suppressor has a voltage rating of at least 400 volts or lower. In most cases, the lowest clamping voltage is the best.
- LED indicators. When this light is on, it means the surge protection feature is ready to block a voltage surge. The LED indicator is different from the on/off light.
- Special suppressors. To protect your most sensitive equipment, buy a suppressor designed to protect TV cable/antenna, telephone, answering machine, computer mo-

dem and fax machine connections.

- Warranties. Some surge suppressor warranties offer replacement of the suppressor only. Others pay for repair of equipment damaged due to a failed surge suppressor. These manufacturer warranties usually do not compensate you for the time and cost of replacing lost or scrambled computer data. Check the warranty carefully for limits and exclusions.

## Protect Your Valuable Data

Computers are especially sensitive to voltage fluctuations. To protect against the loss of data, consider buying an uninterruptible power supply (UPS) system—an energy storage device that will use power from batteries when the power to your home or office goes out or is unstable.

A UPS system can provide protection against both over-voltage and under-voltage conditions, and usually offers voltage regulation.

In the event of a power interruption, a UPS system will give you time to save open computer documents and properly shut down. If your computer is not shut down properly, you could lose what you were working on.

Like surge suppressors, the cost and features of UPS systems vary. Carefully consider your needs before purchasing one. For suppliers of UPS devices, look in the telephone directory yellow pages, under “Computers” and associated services.

A UPS system and voltage suppression equipment are investments. Many times, the data you “house” or keep on your computer is far more valuable than the computer itself.

If your electronic components cost thousands of dollars, can you afford NOT to protect your investment? Consider the value of the UPS or data protection system against the cost of replacing your data or equipment.

## Before Calling...

If you experience power quality problems, please review the following before calling CVEA:

- What equipment or appliances are experiencing problems?
- What's the nature of the problem: data loss, lockups, component damage or flickering lights?
- What time of day or week do the problems occur, and are there any patterns?
- How long have these problems been occurring, and are they periodic or regular?
- Are other problems occurring at the same time, such as lights flickering or dimming, or motors slowing down?
- Are possible problem sources at the site, such as arc welders, air conditioning, copy machines, inverters or variable speed drives?
- Is protection equipment such as surge suppressors, battery backup, UPS or isolation transformers being used?
- Has protection equipment helped?
- Has the wiring and grounding of the location been checked?
- Has the quality of the supplied voltage been checked with a true RMS meter?

CVEA recommends having your electrical panel and wiring inspected at least once every five years, or anytime you experience problems with any part of your electrical system.

