Protecting Electronics from Summer Storms

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It’s summertime! Almost, anyway, and the severe weather is showing signs of an early start this year. So I thought it would be appropriate to answer one question I get asked every summer: how can I keep my electronics safe during a storm?

## Well, Unplug ‘Em

The simplest thing you can do to protect your electronics in a storm is to unplug them. (To be clear, this means unplugging them from the wall, not just turning off their power.)

That’s it. Nothing fancy.

## Invest in a Surge Protector

If you’re too attached to your computer and other devices to unplug them during a storm, a surge protector is the next best thing. When looking to buy, there are three key numbers to focus on: the joules rating (or absorption rating), the clamping voltage, and the response time.

The **joules rating** is how much electricity the surge protector is able to absorb. This isn’t renewable. That means once the surge protector activates its absorption functionality, it permanently loses the ability to absorb some electricity. As a consequence, a big number is good. Both so that the surge protector will last longer, and so that when an especially large surge occurs (such as from nearby lightning), the protector will be able to absorb the entirety of the hit. It also means that if you believe your house has been exposed to an especially large surge, such as from a lightning strike, you should replace your surge protectors.

So what number should you target? In practice, a typical surge, even from storms, will rarely exceed 1,000 joules. But to ensure that a surge protector has a long life, and can even withstand particularly bad surges, I would target something around 3,000 joules if you intend for it to be used on sensitive electronics like a computer or television.

The **clamping voltage**, meanwhile, indicates at what voltage the surge protector will kick in. 330V is the baseline voltage of your outlets, and there are three common standards for clamping voltage: 330V (essentially, anything over the baseline whatsoever), 400V, and 500V. A smaller clamping voltage will result in the surge protector kicking in more proactively, offering better protection to sensitive devices but at the cost of faster wear to the surge protector (as mentioned, whenever the surge protector kicks in, it slowly loses its ability to prevent further surges). In general, a lower number is good, but in some cases a higher number can help compensate for a low joules rating. In any case, avoid anything higher than 400V, if possible.

Finally, the **response time** is how long it takes for the surge protector to detect a surge (as defined by the clamping voltage) and then start preventing the surge from reaching your components. It should typically be very low, generally less than 1 nanosecond.

For recommendations into good, affordable surge protectors, I recommend The Wirecutter’s article, “The Best Surge Protector.” However, my personal recommendation is to check out Monoprice’s line of affordable, highly-rated surge protectors; product ID 9203 is a good option, offering a joules rating of 4,230, a clamping voltage of 330V, and a response time under 1ns.

## Invest in an Uninterruptible Power Supply

An uninterruptible power supply, or UPS, is a luxury item compared to a simple surge protector. They are common in offices and industries where power failures mean losing important work. At home, on the other hand, a power outage simply isn’t that big of a problem for most people.

Once upon a time, computer software was far less resilient to power failures. Files weren’t autosaved and synced to the internet, and in some cases an unexpected shutdown could result in filesystem corruption. That meant losing far more than just what you were working on.

Today, this is no longer the case, but staying connected to the internet is instead increasingly important. So, while a UPS that allows you to watch TV or play games for an extended period of time will be prohibitively expensive for most, one that allows you to browse the Internet and stay connected to emergency services can be quite affordable. After all, the most central device in many of our homes is the internet router, and these require very little power to keep going.

In general, when it comes to UPS, there are two important specs to look at: the maximum output in a single moment, and the battery capacity.

**Maximum output** is fairly simple: it’s how many watts the supply is capable of providing at full charge. Typically, it’s best to only attempt to draw half of this supply, so if you want to connect 200 watts of devices, a 400 watt power supply is your best bet. Unfortunately, the wattage of your devices can be hard to find. A typical laptop is usually on the order of 100 watts while charging, while a full gaming desktop PC can easily use over 500 watts. Most routers will be under 25 watts.

**Battery capacity**, meanwhile, is typically measured in watt-hours. A device that uses an average of 50 watts in an hour is said to use 50 watt-hours, and will run (ideally) for 60 minutes on a battery with 50 watt-hours of storage. Power delivery is imperfect, however, and once a UPS battery runs low it will not be able to keep delivering high wattages. As a result, even if a power supply is listed for 50 watt-hours, it will probably only keep a 50 watt device running for about a half hour. Additional measurements may indicate exactly for how long a UPS has been shown to run at different wattage loads. Be advised that battery capacity often isn’t listed on Amazon product pages, for whatever reason. It should be listed on the product specifications on a manufacturer’s website.

(Note: both measurements—maximum output and battery capacity—may be listed in terms of volt-amps instead of watts. The two aren’t directly equivalent, but you can estimate watts by dividing volt-amps by two. For instance, 100 volt-amp-hours can be estimated as 50 watt-hours.)

One limitation to a UPS, however, is that you can’t connect them to surge protectors (or vice-versa). As a consequence, any devices connected to a UPS will be relying on the UPS’s own surge protection capabilities, which are generally more limited than those of a dedicated surge protector. Plus, as mentioned, surge protectors wear out. Eventually, the built-in surge protection of a UPS will provide no protection at all.

But what this means is that you should be looking at using a UPS for things like internet routers, which both benefit from having power in a power outage and are cheaper to replace in the event of a surge. Phones, tablets, and laptops—most of which have batteries that allow them to run for several hours—can then be used to access the internet during a power outage.

If you want suggestions, I would again look at a Wirecutter article, this time “The Best Uninterruptible Power Supply (UPS).”

## Keep Things Cool and Dry in the Summer Heat

Finally, while not quite storm-related, it is always worth mentioning that electronics hate heat. Typically, they simply “throttle” themselves, slowing down to avoid getting too hot. But damage can still occur, which is why if you’re investing in a surge protector and a UPS, consider also looking into getting a small-space air-conditioner to place in areas with a lot of electronics. Alternatively, if you have central air, you can move all of your electronics to the corner of the room with the air-conditioning vent. Both will help keep your electronics running well in the summer heat.