Podcast Transcript

EPISODE #137

The Ghost in the Machine: Why Gadgets Wake Up After Blackouts

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EPISODE SYNOPSIS

Have you ever been jolted awake at 3 AM by a camera light that suddenly turned itself on after a power flicker? In this episode of My Weird Prompts, Herman and Corn dive into the "ghost in the machine" to explain why some devices have an automatic "on" default while others, like your TV or oven, remain safely powered down. From the mechanical simplicity of old-school switches to the complex firmware of microcontrollers and the dangers of "inrush current" on the electrical grid, the brothers break down the design philosophies that govern our modern appliances. Discover the difference between "dumb" hardware and "smart" protection, and learn how you can use smart home settings to avoid the dreaded "midnight sun" effect in your own home.

DANIEL'S PROMPT

Daniel

I'd like to ask a question about power and electricity. After a power outage at my house, I noticed that when the power was restored, some appliances—like my camera light—turned themselves on even though they weren't on before. Why do some devices have this behavior while most others don't, and what is the cause?

TRANSCRIPT

Corn

Hey everyone, welcome back to My Weird Prompts! I am Corn, and I am sitting here in our living room in Jerusalem with my brother.

Herman

Herman Poppleberry, at your service. It is a bit chilly in here today, Corn. I think that storm last night really knocked the temperature down a few pegs.

Corn

It definitely did. And speaking of that storm, it actually led to the prompt we are tackling today. Our housemate Daniel sent us a voice note after the power went out for a few hours. When the lights finally flickered back on, he noticed something strange. His camera light and an old white noise machine both jumped to life immediately, even though they were off when the power died. But his television, his computer, and the kitchen appliances all stayed dark.

Herman

It is one of those little domestic mysteries that you do not really think about until it happens to you at three in the morning and a bright LED panel suddenly illuminates your bedroom like a secondary sun.

Corn

Exactly. Daniel was wondering why some devices have this behavior while others do not. Is it a flaw? Is it a feature? Or is there some kind of ghost in the machine that just wants to make sure we know the electricity is back?

Herman

Oh, I love this topic because it sits right at the intersection of old school electrical engineering and modern software logic. It is not just one reason; it is actually a handful of different design philosophies and hardware limitations working at the same time.

Corn

Well, before we dive into the deep end of circuit boards and firmware, let’s frame the stakes here. Understanding why your devices do this is not just about satisfying curiosity. It actually touches on home safety, energy efficiency, and how we interact with the increasingly "smart" objects in our lives. Remember back in episode one hundred forty-eight when we talked about local AI and hardware quantization? This is the physical side of that coin. It is about the "brain" of the device and how it handles a total amnesia event.

Herman

That is a great way to put it. A power outage is essentially a forced reboot without a proper shutdown sequence. For an electronic device, that is a traumatic event.

Corn

So, let’s start with the most basic explanation. Why would a simple camera light or a fan turn itself back on? Is it as simple as a physical switch?

Herman

In many cases, yes. That is the "dumb" version of this phenomenon. If you have an appliance with a mechanical toggle switch—think of a traditional bedside lamp or an old school fan with a physical dial—the state of that device is determined by the physical position of the switch. If the switch is "on," the circuit is closed. When the utility company restores power to your house, the electrons find a closed path and start flowing immediately. The device has no "memory" because it does not need one; its physical state is its memory.

Corn

Right, that makes sense for a lamp. But Daniel mentioned his camera light. Most of those modern LED panels use soft-touch buttons or digital interfaces. They do not have a big clunky toggle switch. They feel more "digital." So why does a digital device decide to wake up?

Herman

That is where we move from physics to firmware. Every modern electronic device has a small computer inside it called a microcontroller. When the power comes back on, that microcontroller has to run a piece of code called a boot sequence. One of the very first things that code does is look for an instruction on what to do regarding the "Power Restoration State."

Corn

So, the programmer literally has to decide: "When you wake up, do you stay asleep or do you jump out of bed?"

Herman

Precisely. And for a camera light, many manufacturers set the default to "on." The logic there is often about user experience. If you plug a light into a wall, you usually want it to turn on. If it stayed off and required a secondary button press every time it was plugged in, some users might find that annoying, especially if they use a master switch for their whole studio setup.

Corn

I can see that. If I have all my lights plugged into a single power strip and I flip that strip on, I want the lights to come on without me having to walk around the room pressing ten different buttons.

Herman

Exactly. It is a "feature" for studio professionals, but a "bug" for someone whose power flickers at two in the morning. But there is a more technical layer here too, Corn. It involves something called non-volatile memory, specifically a type of chip called EEPROM, which stands for Electrically Erasable Programmable Read-Only Memory.

Corn

Okay, break that down for me. How does that chip change the behavior?

Herman

Well, some devices are designed to remember their "Last State." If the light was on when the power failed, the microcontroller checks the EEPROM, sees that the last recorded state was "on," and restores it. If it was off, it stays off. The problem is that writing to EEPROM takes a tiny bit of time and energy. If the power cuts out instantly, the device might not have enough residual energy in its capacitors to successfully save its current state.

Corn

So it defaults to a factory setting?

Herman

Right. If the save operation fails during the "death throes" of the power loss, the device wakes up with amnesia and just follows its default programming, which, as we said, is often "turn everything on."

Corn

That is fascinating. It is like the device is trying to scream its last words but the power gets cut before it can finish the sentence. But what about the devices that stay off? Daniel mentioned his TV and his computer. Those are much more complex. Why don’t they just jump back to life?

Herman

That is a much deeper rabbit hole involving safety standards and what we call "inrush current." But before we get into the heavy engineering of why your oven does not spontaneously start baking when the grid comes back, let’s take a quick break.

Corn

Good idea. Let’s hear from the people who keep the lights on around here, figuratively speaking. Larry: Are you tired of your neighbors having more electricity than you? Do you look at your toaster and wish it had more... ambition? Introducing the Static Trap Five Thousand! This revolutionary, hand-crafted copper mesh umbrella is designed to sit on your roof and literally pull "free" electricity right out of the atmosphere. Why pay the utility company when there is perfectly good lightning just floating around? The Static Trap Five Thousand stores ambient ions in a patented jar of heavy water, providing you with enough energy to power a nightlight for up to twelve minutes! Warning: May attract migratory birds, localized thunderstorms, and federal investigators. The Static Trap Five Thousand—it is not stealing if it is from the sky! BUY NOW!

Corn

...Thanks, Larry. I am not sure I want to be holding a copper umbrella in a Jerusalem winter storm, but the enthusiasm is appreciated.

Herman

I am fairly certain "pulling ions into a jar" is not how the grid works, but let’s get back to actual electrical engineering.

Corn

Right. Before the break, you mentioned "inrush current" and safety. Why is it that my toaster or my microwave will never, ever turn itself on after a power outage, but a cheap LED light will?

Herman

Safety is the primary driver for high-wattage appliances. Imagine if you were cleaning your oven or if you had left a piece of clothing near a space heater when the power went out. If those devices automatically resumed their "on" state when the power returned—perhaps while you were asleep or out of the house—it would be a massive fire hazard.

Corn

That makes total sense. You want a "human in the loop" for anything that generates heat or has moving parts.

Herman

Exactly. Most international safety standards require that "high-risk" appliances default to a "safe state," which is almost always "off." They require a physical, intentional interaction from a human to restart. But there is also the "inrush current" problem I mentioned. This is a big one for the utility companies.

Corn

What exactly is inrush current? It sounds like a sudden flood.

Herman

That is exactly what it is. When an electrical motor or a large power supply first starts up, it can pull five to ten times its normal operating current for a fraction of a second. Now, imagine a whole city block where the power has been out. Every single house has a refrigerator, an air conditioner, and maybe a few computers. If every one of those devices tried to start up at the exact same millisecond the power was restored, the total demand would be astronomical.

Corn

It would probably just trip the main circuit breakers for the whole neighborhood again.

Herman

Exactly! It is called "Cold Load Pickup." Utility companies hate it. To prevent this, many modern devices—especially those with large compressors or power-hungry components—are designed with a "randomized delay" or a requirement for a manual restart. By forcing most devices to stay off, the grid can stabilize before people start turning things back on one by one.

Corn

So, the "smart" behavior of a computer staying off is actually a way to protect the electrical grid from a massive heart attack?

Herman

Precisely. Your computer’s power supply is a complex piece of kit. It waits for a specific "Power Good" signal from the motherboard before it fully engages. If the voltage coming from the wall is a bit wobbly—which it often is right after a restoration—the computer will refuse to start to protect its delicate internal components.

Corn

That is a great distinction. The camera light is "dumb" enough to just trust the wall, while the computer is "smart" enough to be suspicious of the quality of the electricity.

Herman

That is a perfect way to frame it. Now, Daniel also mentioned a white noise machine. Those are interesting because they often use very simple, cheap microcontrollers. In the world of ultra-cheap electronics, the "default on" state is sometimes just the easiest way to code the chip. It takes more lines of code and more memory to build in a "check last state and wait" routine than it does to just have the main loop start the motor or the speaker as soon as voltage is detected.

Corn

It is basically the path of least resistance for the programmer.

Herman

Right. And there is one more category we should talk about: Smart Home devices. You know, the bulbs and plugs that connect to your Wi-Fi. These are actually the most interesting because they give the user a choice.

Corn

I have noticed that in my smart home app. There is literally a setting called "Power Loss Recovery."

Herman

Yes! Because smart bulbs are always "electronically on" even when the light is "off," they have to have a policy for power outages. For years, the default for most smart bulbs was "Turn On at One Hundred Percent Brightness." The logic was that if you used a traditional wall switch to turn the bulb off and on, you would want it to act like a normal light bulb.

Corn

But that led to the famous "Midnight Sun" problem where a five-second power flicker at midnight would turn every single light in your house on to full blast, waking everyone up.

Herman

It was a huge complaint in the early days of the smart home. Nowadays, most companies like Philips or Ikea let you choose. You can set it to "Last State," "Always Off," or "Default Brightness." This is a perfect example of how we are moving from "static" hardware behavior to "user-defined" firmware behavior.

Corn

So, if Daniel is annoyed by that camera light, he might want to check if it has any smart features or a companion app. Though, if it is just a basic light, he might be stuck with its "default on" personality.

Herman

There is actually a "lo-fi" solution for those basic devices. You can buy a "smart plug" and set the plug's behavior to "Always Off" after a power loss. That way, the plug acts as a gatekeeper. Even if the camera light wants to turn on, the plug stays dead until Daniel tells it otherwise.

Corn

That is a clever workaround. It is basically adding a brain to a brainless device.

Herman

Exactly. And we should also mention that sometimes, the "turning on" behavior is a diagnostic tool. Some high-end servers and networking equipment will spin their fans up to one hundred percent as soon as they get power. They are checking to see if the cooling system is functional before they allow the expensive processors to generate any heat. If you hear a loud "whoosh" from your office after a power cut, that is just your hardware doing a self-test.

Corn

It is like the device is taking a deep breath before it starts its workday.

Herman

I like that. Now, there is one more thing that most people do not realize. Sometimes a device turning on is not about the power coming *back*, but about how the power *left*.

Corn

Wait, what do you mean?

Herman

Well, power outages are rarely "clean." You often get a series of "brownouts" or rapid surges before the line goes totally dead. Those rapid fluctuations can sometimes "glitch" a microcontroller into a weird state. It might trigger a "test mode" or bypass the normal power-button logic. If the voltage drops to, say, seventy volts instead of one hundred twenty, the logic gates inside a chip can start behaving unpredictably. They might flip a "zero" to a "one," and suddenly the device thinks you pressed the "on" button.

Corn

That sounds like a recipe for hardware damage.

Herman

It absolutely is. This is why we always recommend surge protectors or, even better, an Uninterruptible Power Supply, or UPS. A UPS is basically a big battery that sits between your wall and your sensitive electronics. It cleans the "dirty" power and gives the device enough time to shut down properly. If Daniel had his camera light on a UPS, it would never have seen the power outage at all.

Corn

We actually talked about the importance of stable power back in episode one hundred seventy-six when we were discussing the power requirements for high-end audio equipment. It is the same principle. Clean power is happy power.

Herman

It really is. So, to summarize for Daniel: the reason your camera light turns on is likely a combination of a "default-on" firmware setting designed for convenience, and a lack of safety-critical reasons to keep it off. Your TV and computer stay off because they are designed to protect themselves and the grid from sudden surges, and your microwave stays off because it does not want to burn your house down.

Corn

It is a fascinating mix of intentional design, cost-cutting in programming, and high-level safety engineering. It makes you realize that even a "simple" device is making a lot of decisions the moment it wakes up.

Herman

It really is a "Welcome to the World" moment for every piece of silicon in your house.

Corn

Well, I think we have shed some light on the situation—pun intended. This has been a great deep dive into something we usually take for granted. Before we wrap up, I want to remind everyone that if you are enjoying these explorations into the weird and the wired, please take a second to leave us a review on your podcast app or on Spotify. It genuinely helps other curious minds find the show.

Herman

And if you have your own "weird prompt" or a domestic mystery like Daniel's, head over to myweirdprompts.com and use the contact form. We love hearing what is on your mind.

Corn

You can also find our full archive there, including the episodes we mentioned today. We have a pretty robust RSS feed for the subscribers too.

Herman

Thanks for the prompt, Daniel! I hope your camera light behaves itself tonight.

Corn

And thanks to all of you for listening to My Weird Prompts. We will be back next week with more deep dives and hopefully fewer sketchy umbrellas.

Herman

Until next time!

Corn

Goodbye, everyone!

Herman

This has been My Weird Prompts. See you in the next one!