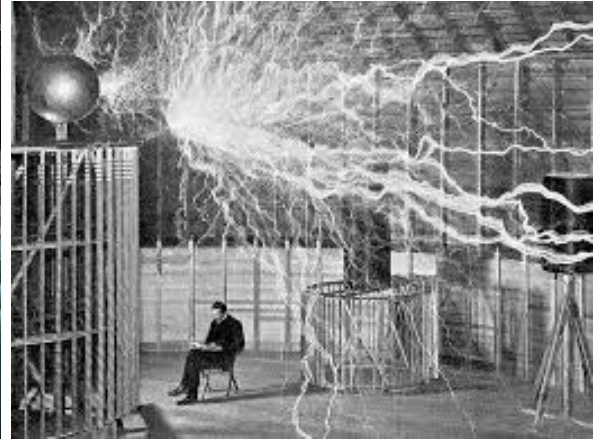
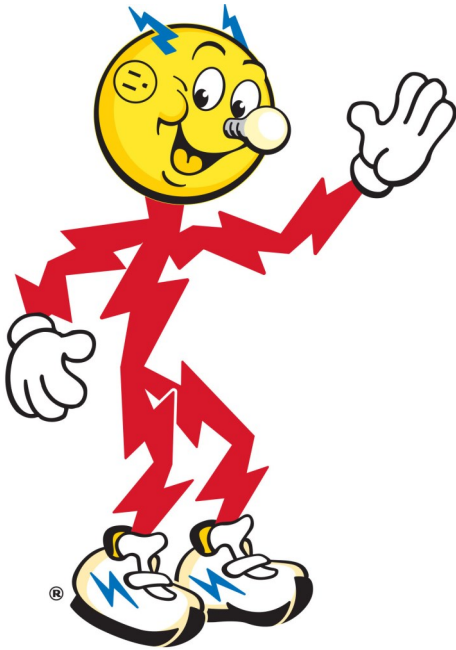


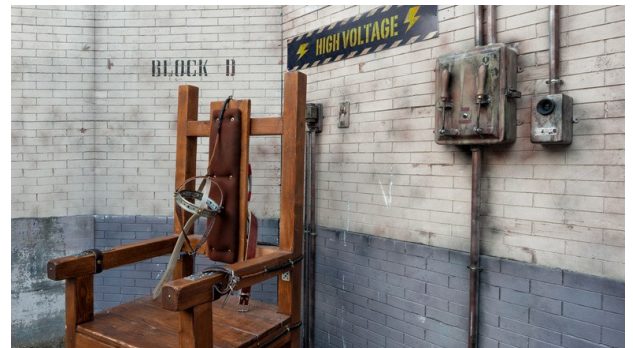
Microvolt

Monthly newsletter of the Utah Amateur Radio Club

May 2026



Our Electric World



What is electricity? It's the feeling of your first kiss. Or the excitement of bringing home a new HF rig. All kidding aside, **electricity** is the layman's term for **electrical energy**, the quantitative property required to perform work by electrical means. From enabling us to see and hear, to powering our radios, the use of electricity has become so ubiquitous (everywhere present) that we often take it for granted. We use it to power appliances, vehicles, phones, and yes, radios. What else do we know about the electric world in which we live?

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Cover – Our electric world

Yes, we use electricity in just about every facet of our lives today, much of it invisible, or at least unnoticeable. No, [Benjamin Franklin](#) didn't discover electricity, but neither did Tesla, Westinghouse, Edison, or even Einstein. Honestly, nobody knows who "discovered" electricity, since lightning has been around for at least as long as Moses. If we were to credit somebody with the "discovery" of the nature of electricity, it would likely be [Thales of Miletus](#), who identified electricity from rubbing fur on amber (a fossilized tree sap) around 600 BC. Indeed, the Greek word *elektron* means *amber*.

To most of us who are not theoretical physicists, we identify two types of electricity, *static* and *current*. Static electricity is the accumulation of charged particles on the surfaces of non-conductors, such as glass, balloons, carpeting, and cat fur. It's called *static* because the charged particles don't travel in an electrical path until they come in contact with a conductor. Current electricity is a stream of charged particles that flows in a conductive material, and the type we generally rely on, to produce useful work.

Electricity produces or results in useful work by providing the energy that a device can transform into a different energy type, such as mechanical, radiant (light), sound, thermal (heat), and electromagnetic. Electromagnetic energy is not actually a separate form of energy from radiant energy, but is listed here because of its relevance to radio. Electricity can be converted to other forms of energy through the following devices, for example:

- Light : incandescent bulb or LED
- Heat : electric heater
- Mechanical : electric motor
- Chemical : electrolysis
- Sound : speaker

By similar or reversible processes, these same energy forms can also be converted to electricity through the following devices, for example:

- Light : solar panel
- Heat : thermocouple
- Mechanical : electric generator
- Chemical : battery
- Sound : microphone

[Lightning](#) is a special case of electrical manifestation due to its often spectacularly violent nature. It starts



as static electric charges. Then, when a sufficient quantity of the charges accumulate, whose 1) resulting electric field gradient exceeds that of another electric field of lower potential and 2) the difference (in field strength per distance) is sufficient to overcome the dielectric between them, the accumulation discharges in an attempt to equalize the separated electrical gradients. In other words, FLASH, BOOM! For a short time, the static becomes current, yet the current is neither AC (alternating current) nor DC (direct current), but a *transient*.

Besides lightning, electricity can be manifest in some unusual ways. For example

- the [electric eel](#) can produce up to 1 ampere at up to 600 volts, which it can discharge for around two milliseconds, therefore at around 500 Hz
- the [piezoelectric effect](#), which is the basis for the working of a crystal oscillator
- a good number of seafaring sailors have reported luminous plasma discharge on their ship masts, also known as [St. Elmo's Fire](#)
- electricity in [quackery](#) has been, and still is, in use by fraudulent, self-proclaimed healers.

Not sure whether you caught that reference on the cover page, but yes, we use electric current to see and hear. The entire human brain is an unprecedented electrical engineering marvel, a self-healing computer capable of consciousness, constantly adapting to use cases and environment by self-modifying code. All our senses communicate by electrical impulses through neurons between the points of stimulus (eyes, finger tips, ears, etc.) and either to the backplane (spinal cord) or all the way to the mainframe (gray matter), using electrical gap technology. And its software? AI, of course. Well, just I.

Microvolt editorial staff