

Foreword

There's something special about bringing a project to life that you read about in a book or that started as an idea in your head. And sometimes the simplest things are the most satisfying.

One of my favorite childhood projects was a mischievous little device made of a single resistor connected between the tip and ring of a telephone line. I used a piece of one-sided copper circuit board with rub-off symbols to lay out the design, and then I etched the unprotected copper away using ferric chloride in my basement. You could still use the phone normally to make outgoing calls, but anyone calling the house would receive a busy signal. This was the perfect way to make sure my parents didn't receive any phone calls from my teachers during dinner!

A few years later, I modified a garage door opener to open any door of the same brand. In normal operation, the passwords on the transmitter and receiver were manually set with a series of 10 DIP switches. If the transmission signal matched what the receiver was expecting, then the garage door would open. I replaced the switches on my transmitter with a common 555 timer IC, to generate a clock signal, and a 10-stage binary counter, a type of digital logic device, to automatically try every single possible combination (that's 2^{10} or 1,024 attempts). Within a few minutes of holding down the button, the correct password would be transmitted and the garage door would open! I never used my universal "brute force" garage door opener for malicious purposes, but it reinforced my hacker mindset—solving problems with unconventional solutions, pushing the limits of technology, harming no one, and learning through constant questioning and experimentation. I also thought it was pretty cool to be able to modify an off-the-shelf device and make it do something the original designers probably never anticipated.

When I was much younger, I somehow ended up with a 6V lantern battery and a spring from an adjustable lamp. I wondered, "What would happen if I connected the spring between the battery terminals?" So of course, I tried it. The spring got hotter and hotter until I freaked out, plucked it off the terminals, and threw it into the bathroom sink. I had created a short circuit by connecting the positive and negative terminals of the battery together, causing current to flow between them. I never looked at batteries and springs the same way again.

I remember trying to build my own alarm system for my bedroom door, sort of a low-tech version of the one you'll build in Chapter 1. I hung an old AM/FM radio from a hook on the back

of my door, tuned it to static, turned the volume up to maximum, and “armed” it by connecting the sliding power switch to a wire I had attached to my wall. In theory, when the door opened, the wire would pull the switch and turn on the radio, blasting white noise at the intruder. That didn’t happen. Instead, when my dad opened the door, the radio slid off the hook and crashed onto the floor. Back to the drawing board on that one!

These stories are meant to do one thing: inspire you to explore the wonderful, wild world of electrons—and this book is the perfect launch pad! Øyvind breaks down complex electronics fundamentals in an enjoyable, fun way. His passion for electronics and his love for teaching shine on every page. Starting with the basics and building up from there, you’ll end up with the power to create bigger, better, faster, and more intelligent projects on your own. There’s no better way to learn than by *doing*. So go ahead, turn the page and begin your adventure into all that electronics has to offer!

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