**BuildElectronicCircuits** 

# **Getting Started With Electronics**

# The Simple Guide On How To Get Started Building Electronics



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1 INTRODUCTION

# **1** Introduction

Hi and welcome to my book!

In this book you will learn how to get started with electronics. The main focus will be on the practical aspect of getting you to build circuits. Building circuits is the most important skill to know in electronics.

The intended audience for this book are complete beginners who want to get started with electronics. This is no comprehensive theoretical book, but a simple and straight-forward guide for getting started.

Instead of bombarding you with electronics theory, my aim is to give you the tools you need to start building electronics. Then later, you can choose if you want to dive deeper into the theory (there are many books out there on that subject).

I really urge you to do the examples in this book on your own. You will remember everything much better by practicing what you learn. And actually building electronics will give you an experience level which is impossible to get just by reading.

## 1.1 What You'll Learn In Each Chapter

I will start you off in chapter 2 with a story of how I learned my first lessons in electronics.

In chapter 3, you will learn how to build your first circuit on a breadboard.

Then in chapter 4 you will learn to solder and you will solder your first circuit.

Chapter 5 includes an overview and description of the most common components used in electronics. This is a very useful overview to have when building circuits and I advise you to look up components here when you are unsure.

Then in chapter 6 I will give you some circuits that you are going to build on your own to practice your building-skills.

# 1.2 Stay Safe

All the circuits in this book are designed to be powered by a 9V battery and are totally safe. When you go to find circuits on your own, make sure you only deal with low power circuits (unless you know what you are doing).

#### 1 INTRODUCTION

If you want to learn more about safety, check out this article: http://penguintutor.com/electronics/electrical-safety

It can be smart to use goggles when soldering to avoid hot solder or pieces of metal shooting into your eyes.

# 2 How To Make A Light Blink

The first circuit I ever built was a circuit that flashed a light.

I was at home and probably around 14 years old at the time. I was walking between the television and my computer as I used to. I would surf the net, then I'd hear something interesting from the television which my mom and dad were watching and I would walk over to see. Then back again to my computer. This was my routine.

I had been interested in computers for a while, and I had started learning a bit of programming/scripting.

Something interesting came up on the television, so I walked over. Suddenly, the doorbell rang. My dad got up, turned the TV on mute, and went over to see who it was. I noticed something. There was a red light on the television that was blinking. It was probably because the TV was on mute, but I had never really noticed it before. My brain started getting curious. How can you make a light blink like that?

I started thinking about it more and more. I had never looked into this before, so I was totally blank on how that blinking light could actually work. The more I thought about it the more I wanted to find out.

So I asked my dad. "I don't understand it. How can you make a light blink like that?", I asked.

#### 2 HOW TO MAKE A LIGHT BLINK

Something lit up in my dad's face. "Wait here", he said.

Then he walked into the kitchen, got some pen and paper and came back. He sat down and started drawing. He drew a small circuit diagram consisting of a relay, a light bulb and a battery.



### 2.1 What Is A Relay?

I didn't understand much of course. My dad looked at me and he could see I was looking like a question mark.

"First of all, when you connect a battery to a small light bulb, the light bulb will light up", he said. "And by using a relay, you can make the light turn on and off."

#### 2 HOW TO MAKE A LIGHT BLINK

"But what is a relay?", I asked.

He explained to me that inside a relay there is an electromagnet.



"An electromagnet is really as simple as a piece of iron with some insulated wire wound around it. If you connect the two ends of the wire to a battery, the iron will become magnetic. You can actually create your own electromagnet by winding some wire around a nail."

"In a relay the electromagnet is positioned so that a switch will change position when the electromagnet is turned on."



"Let's look at the circuit again", he said.

Then he explained "You see, when the relay is powered, the switch will disconnect the power from the electromagnet and connect the power to the light bulb instead so that it will light up. But then when the relay is no longer powered, it will switch back and turn off the power from the light bulb and give power back to the electromagnet again. Then the cycle starts over again."

As soon as I understood that, I was able to understand how you make a light blink. And I was in ecstasy! I had to build this!

Luckily my dad was an engineer and had some relays laying around in addition to the necessary soldering tools. So I ran down into the basement and started building the circuit.

But, it turned out that this circuit worked much better as a way to

understand a principle than as a practical circuit. The relay switched between positions really fast so I couldn't really see the light blinking.

"Dad, the relay is switching way too fast! How can I slow it down?"

"Well, you need something that can store power for a short while to slow down the relay switching." he said.

"You mean like a rechargeable battery?", I asked.

"Well, yeah, in a sense. But in electronics we have a component called a capacitor."

(...)

### This is a preview of "Getting Started With Electronics".

#### For the full version, go to:

http://www.build-electronic-circuits.com/gswe