

Practical Electronics

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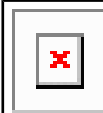
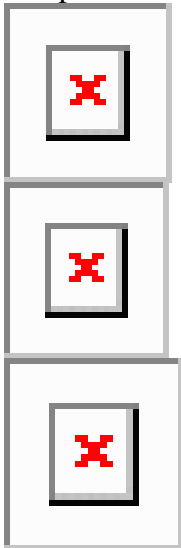
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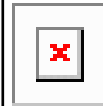
Practical Electronics

A Guide to Understanding and Creating Electronic Circuits.

The aim of this book is to teach you simple analogue and digital electronics at a practical level. For the in-depth theory of electronics, please read the [Electronics Textbook](#). By the end of this book, you should be able to combine circuit elements to create more complex circuits, and have an understanding of how it works. To begin, you need just basic knowledge of high-school mathematics and physics, common tools and and piece of enthusiasm.



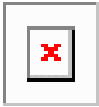
This textbook is still under development. If you would like to be part of this project, add your name to the list on the [Collaboration Page](#)!



In order to keep this Wikibook neat and to ensure high quality of communication, please read the [Manual of Style](#) for this book. Please refer to this before submitting diagrams or pictures, and also heed the rules on units and conventions. This text is written in collaboration with [\[1\]](#).

Sections

Chapters and subchapters (icons show the completion)



Beginning

How to begin? What I do need to have and know?

What you need to have

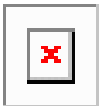
- 1. Tools
- 2. Material

Basic Theory



Printed Circuit Boards


-  Layout
- Manufacture
- Soldering
- Desoldering
- Breadboard
-  perfboard



Simple components

Introduction to linear, passive components and some circuit examples.

Simplest Circuits

-  1. Parallel and Serial circuits
- 2. Kirchhoff laws
- 3. Short connection

Basic Components

Resistors



Capacitors



Inductors



Inputs



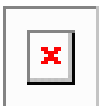
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Outputs



?

Sources



Semiconductor components

Nonlinear semiconductor components

Diodes



Bipolar Transistors

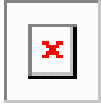


Unipolar Transistors



MOSFETs

and examples of circuits, of course.



Alternating current

Properties and circuits concerning the current varying in time

- **Alternating current**



- **Amplifiers**



1. Types of Amplifiers
2. Class
3. Feedback
4. Examples of circuits
5. Integrated_Amplifiers

- **Generators**

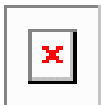


1. Astable multivibrator
2. 555 Timer

- **Oscillators**



1. LC oscillator
2. RC oscillator
3. Crystal_oscillator
4. HF Oscillators



Integrated circuits

Work with obscure and mighty IC's

- Introduction to Integrated Circuits

- **Logic**



- Boolean Algebra
- Boolean Identities
- Flip-flops
- Astables
- Binary Numbers
- BCD
- Adders

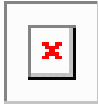
- **Logic Families**

- Diode Logic (DL)
- Resistor-Transistor Logic (RTL)
- Diode-Transistor Logic (DTL)
- Transistor-Transistor Logic (TTL)
- Emitter-Coupled Logic (ECL)
- Integrated Injection Logic (I²L)
- CMOS

- **AD and DA Converters**



- **Memory Devices**
- CompactFlash



Appendices

Useful info that didn't pass elsewhere

- **Finding component information**
 - Resistors – colour code
 - Capacitors – number code
 - Datasheets
- **Overlays, Grids and Guides**
 - Standards
 - Device pinouts
- **Operating amplifiers**
 - Tables
 - Units and Quantities
 - Prefixes
 - SWG Wire Sizes - merge
 - Preferred Values - merge
 - Greek Alphabet - merge
 - 74 Series ICs - merge
 - 4000 Series - merge
 - 7400 Series - merge
 - Other ICs - merge
 - Manufacturer's Prefixes - merge
- **Common Problems**
- **Test Equipment**
 - Multimeters
 - Oscilloscopes
 - Crowbar Circuit
 - Circuits to Make Yourself
 - Glossary

Further reading[edit]

- **Electronics**: An in-depth study of *how* electronic systems work.
- **Semiconductors**: Explains the physics behind semiconductor devices.
- **Television Manufacture and Repair**: detailed description and instructions on cathode ray tube manufacturing
- **Electric Vehicle Conversion**: description and instructions for converting common internal combustion engine (ICE) driven vehicle to battery electric propulsion.

Practical Electronics

- **Robotics:** practical tips for building robots

