

SAVE THIS!

Horowitz & Hill is not a great textbook, but we've forced you to suffer through it because it *is* a great reference book that will be useful for you in the future. Hang onto it!

Check out the appendices. There is also a useful 21-page index (with an updated 33-page index available on the course website) and a nice 4-page annotated bibliography. Use them.

Things that we haven't covered in class you will need someday:

- Filters (Chapter 6)
- Power supplies (Chapter 9)
- Microcontrollers (Chapter 15)

And some still useful stuff from the old second edition (pdf available on the course website) that got left out of the 3rd:

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| 1. Construction Techniques: | Chapter 12 |
| 2. Radiofrequency and high speed circuits: | Chapter 13 |
| 3. Low-Power Circuit techniques: | Chapter 14 |
| 4. Transducers and Signal Processing: | Chapter 15 |

The “X-chapters” volume has come out. It doesn't have quite the promised material, but a lot of good information on all kinds of components, and good sections on power amplifiers and control. The selection is pretty random, but it might have just what you need.

The book cannot stay up-to-date, of course, but we've tried to show you how to use data sheets to find properties of new devices. Many manufacturer's websites have “part finders”, where you can enter ranges for critical parameters, and it will give you a list of parts that meet these criteria. In the end, you always have to look at the data sheets to make sure it's what you want. See Appendix N. Also see Appendix M in H&H. The IC manufacturers put out "Application Notes" — usually available from their websites — that show suggested applications for their latest devices in considerable detail. These are usually very good and are written by expert engineers to be instructive about the details of the application. Look to see if there's one for the IC you think you want to use. You can also look through the lists of titles of these for something that might apply to what you're trying to do — one for a related chip or a more general topic can also be useful.

I've collected some application notes and other short articles and put them in the “miscellaneous electronics tips” folder on the Ph 623 website. Hopefully the file names are sufficiently descriptive to see which ones are of interest. Note that there are several articles on aspects of “grounding.” Some of you ran into problems with this just on your breadboards, but every time you work on a larger system you'll spend a lot of your time on grounding issues (our current rocket instrument has ~10 different grounds). It's not [entirely] black magic, so read some of these when the time comes.

If you want to do your own simulations, a good free download is LTspice XVII, Analog Devices' version of SPICE, with schematic capture interface. This is pretty much analog-only. It is compatible with component libraries from other manufacturers. The Windows UI is similar to Multisim. The Mac version takes some getting used to (Google for tutorials.) There is a writeup on LTspice by Kael Hansen on the website. Also see Appendix J in H&H. KiCad is quite good for PC board layout. It also has a simulator, but you have to build your own library. Probably easier to use LTspice for the modeling and redraw the circuit for KiCad.

Physics 623 comes with 5 years of free consulting. If you run into an electronics problem in your research, you're welcome to come ask. I may not be able to help you, but we can have fun talking about it.