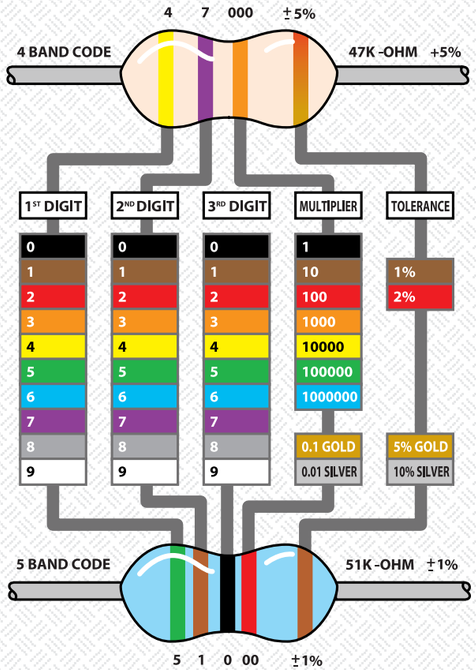
RESISTORS:

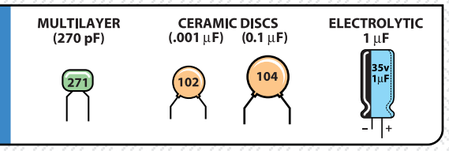
The electrical value of resistors is indicated by a standard color code. Any resistor with a black multiplier band falls between 10 and 99 ohms in value, brown designates a value between 100 and 999 ohms, red indicates a value from 1000 to 9999 ohms (also expressed as 1.0K to 9.9K), etc. Resistors are not polarized, meaning they can be inserted in either orientation and they act electrically identical.



CAPACITORS:

Unlike resistors, capacitors do not use a color code for value identification. Most monolithic and ceramic capacitors are marked with a three number code (also known as an "IEC code"). The first two digits indicate a numerical value, while the last digit indicates a multiplier. Small-value capacitors are characterized in pF (or pico-Farads, 10^{-9}), while larger values are labeled in µF (or micro-Farads, 10^{-6}). Electrolytic capacitors are always marked in µF - these devices are polarized and must be oriented correctly during installation. There may be additional markings on the capacitor (sometimes just a single character), which is usually to denote the voltage rating or manufacturer of the capacitor.

VALUE	CODE
10 pF	100
100 pF	101
1000 pF	102
.001 µF	102
.01 µF	103
.1 µF	104



ADDITIONAL RESOURCES:

There are a number of excellent books and magazines to help you learn about electronics:

Radio Shack offers an "Engineer's Notebook" series of books that provide an introduction to formulas, tables, basic circuits, schematic symbols, integrated circuits, and optoelectronics (light emitting diodes and light sensors).

The two most popular hobbyist magazines, Nuts & Volts (www.nutsvolts.com) and Circuit Cellar (www.circellar.com) are produced monthly and contain a good amount of information and do-it-yourself projects.

"The Art of Electronics" (Cambridge University Press, 1989) by Horowitz and Hill is essential reading for basic electronics theory and covers just about every aspect. It is often used as a course textbook in university programs.

DS-REV 1.0

SMT BASICS

ASSEMBLY TECHNIQUES

PIXELS PAST ATARIAGE

Building a cartridge or other electronic kit requires basic soldering skills and electronics knowledge. This document describes what tools you'll need, how to correctly identify components, proper soldering methods, and other useful tips and resources. To avoid making needless mistakes, work for short periods when you're fresh and alert. Recreational construction projects are more informative and fun when you take your time. Enjoy, and thanks for purchasing this product!

AtariAge is the exclusive distributor of Pixels Past's PCBs and other homebrew supply products. Please contact AtariAge support (support@atariage.com) for technical assistance and customer service issues.

CONSTRUCTION AREA:

Your construction area should be a clean, smooth, and well-lit area where you can easily organize and handle small parts without losing them. An inexpensive sheet of white poster board makes an excellent construction surface, while providing protection for the underlying table or desk. If you live in a dry environment that is prone to static electricity, it is recommended that you purchase an anti-static mat from a local electronics store to prevent static discharge and protect the sensitive circuitry.

Well-diffused overhead lighting is recommended- bright white fluorescent or incandescent bulbs serve this purpose. A smaller, high-intensity desk lamp will prove especially helpful for close-up work.

Safety is an important consideration. Be sure to use a suitable stand for your soldering iron, keep the work area free of unnecessary clutter, wear protective goggles at all times, and avoid tangling the wires of your various tools.

10 INCHES TO NEXT FOLD

5 INCHES TO FOLD