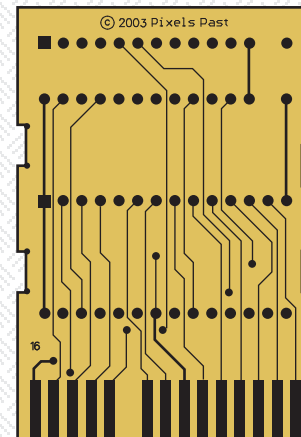
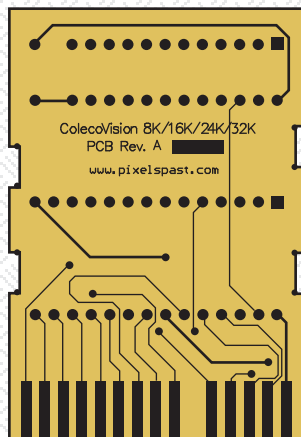


[illegible]

ATARI 2600 ACTIVISION 2K/4K PCB BACK



Pixels Past does not assume any liability arising out of the application or use of any product or circuit described herein. Pixels Past guarantees that the printed circuit boards are electrically tested and meet physical design and manufacturing requirements. Pixels Past warrants to replace any unmodified circuit board proven to be flawed. Pixels Past is not responsible for improper use or placement of components, incorrect soldering techniques, damage to systems, or other assembly or electronics issues. Pixels Past reserves the right to make changes without further notice to any products herein to improve reliability, function, or design.

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- Create 8K, 16K, 24K, and 32K games for the ColecoVision™ video game system
- Uses easily available, off-the-shelf components
- Fits into standard Colecovision cartridge cases
- Build new Colecovision games without modifying old cartridge circuits

Pixels Past's ColecoVision PCB (Printed Circuit Board) provides homebrew game authors with an easy method of creating their own videogame cartridges. The PCB, which fits into standard ColecoVision cartridge cases and works on any ColecoVision or compatible system, supports any 8KB, 16KB, 24KB, or 32KB ColecoVision game binary. These boards have been designed with the hobbyist in mind - they are simple to assemble and have extremely high-reliability.

The ColecoVision PCB is easily assembled by anyone with basic soldering skills, and most of the required components are included with your purchase from AtariAge. The ColecoVision PCB is designed for game developers who do not want to go through the hassle of modifying old cartridge circuit boards. These are brand new boards designed by Pixels Past (<http://www.pixelspast.com>), not recycled boards from old games.

If you'd prefer not to solder the boards yourself, AtariAge (<http://www.atariage.com>) provides homebrew services to build and assemble game cartridges. They can also design and produce full-color manuals and labels.

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# COLLECTO

PIXELS PAST ATARIAGE 81K/16K/24K/32K PCB ASSEMBLY

BILL OF MATERIALS:

The following parts are required to create a functional ColecoVision game cartridge. All components, except for U1, should have been included with your purchase from AtariAge. Components can also be found at most local electronics stores and large on-line distributors such as Digi-Key (www.digikey.com) or Jameco (www.jameco.com).

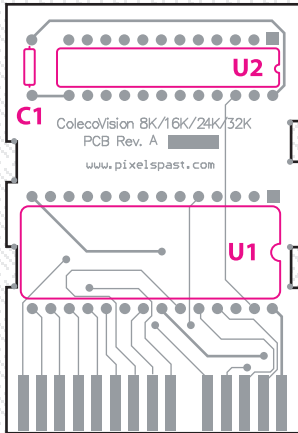
DESIGNATOR

	PART NUMBER	DIGI-KEY	DESCRIPTION
U1	2764(A), 27128(A), or 27256(A)	N/A	EPROM (with game binary*) CMOS OK, 100nS - 250nS
U2	20V8 Complex Programmable Logic Device (PLD)	ATF20V8B- 10PC-ND	Must be programmed with Pixel Past ROM size configuration code, specify 8, 16, 24, or 32K when ordering from AtariAge
C1	0.1μF ceramic	399-1880-1-ND	Bypass capacitor (104), axial leads
PCB	Colecovision PCB	N/A	Pixels Past cartridge PCB

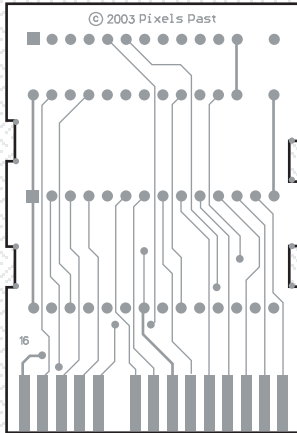
\* Part type depends on binary size

PARTS PLACEMENT:

COLECOVISION 8K/16/24K/32K PCB FRONT



COLECOVISION 8K/16/24K/32K PCB BACK



ASSEMBLY INSTRUCTIONS:

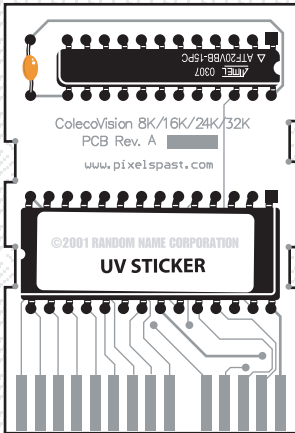
Assembly of the ColecoVision PCB is simple, but requires basic soldering skills. The order of parts placement and soldering of the devices onto the PCB is extremely critical.

Pin 1 of the ICs (Integrated Circuits, in this case U1 and U2) is denoted by a square pad on the circuit board. Please refer to the separate Basic Assembly Techniques pamphlet (available from AtariAge.com) if you need an introduction to soldering and assembly techniques.

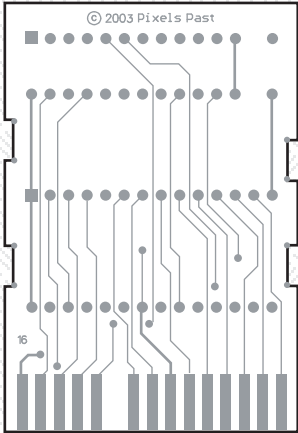
1. Insert and solder C1 to the front of the board. C1 should be a small-footprint axial leaded device in order to fit properly onto the circuit board and into the cartridge housing.
2. Insert and solder U2 to the front side of the board.
3. Insert U1 onto the front side of the board and solder it into place. It is recommended that you place a UV-resistant sticker over the EPROM window to prevent accidental erasure of the code stored in the device.

THE COMPLETED, ASSEMBLED CIRCUIT BOARD SHOULD RESEMBLE THE IMAGES BELOW:

COLECOVISION 8K/16/24K/32K PCB FRONT



COLECOVISION 8K/16/24K/32K PCB BACK



THEORY OF OPERATION:

The ColecoVision system was designed to support up to a 32KB game binary using custom ROM (Read-Only Memory) devices. In order to support currently available memory devices, such as the commonly used EPROM (Erasable Programmable Read-Only Memory, which are erasable with UV light and reprogrammable), a programmable logic device (PLD) is used to handle the necessary chip select routines. Using a single PLD as opposed to discrete logic components reduces overall cost and simplifies the design. The desired game size must be specified when ordering the ColecoVision PCB from AtariAge.

The memory map for program code of the ColecoVision is divided into four 8K blocks. Four active-low chip select lines are used to determine which 8K block of ROM will be enabled at that particular point in time, allowing up to a total of 32K to be accessed. Only one chip select may be asserted at any given time.

If CS1 (also known as /8000) is asserted, the first 8K memory section of ROM is enabled with an address space of 8000-9FFF. If CS2 (also known as /A000) is asserted, the second 8K memory section of ROM is enabled with an address space of A000-BFFF. If CS3 (also known as /C000) is asserted, the third 8K memory section of ROM is enabled with an address space of C000-DFFF. If CS4 (also known as /E000) is asserted, the fourth 8K memory section of ROM is enabled with an address space of E000-FFFF.

Due to the fact that no 24KB EPROM devices exist, in order to produce a 24KB ColecoVision cartridge, the game binary must be programmed into a 32KB EPROM, leaving 8KB of unused memory space.

C1 serves as a bypass/decoupling capacitor to help reduce electrical noise on the power supply line coming from the ColecoVision system. The circuit will function without C1, but voltage spikes could cause irregularities in cartridge operation, so it is highly recommended to install it.