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10 INCHES

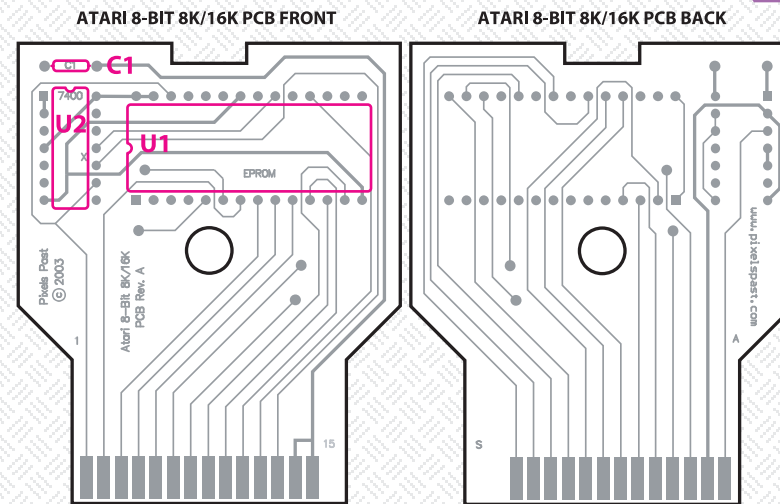
BILL OF MATERIALS:

The following parts are required to create a functional Atari 8-bit game cartridge. All components are available for 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) or 27128(A)	N/A	EPROM (with game binary) CMOS OK, any speed
U2	74LS00	296-1626-5-ND	Quad 2-input NAND logic gate, 14-pin DIP (*see note)
C1	0.1µF Ceramic	399-1880-1-ND	Bypass capacitor (104), axial leads
PCB	Atari 8-bit 8K/16K PCB		Pixels Past cartridge PCB

* Not needed for use in Atari 8-bit 8K games

PARTS PLACEMENT:



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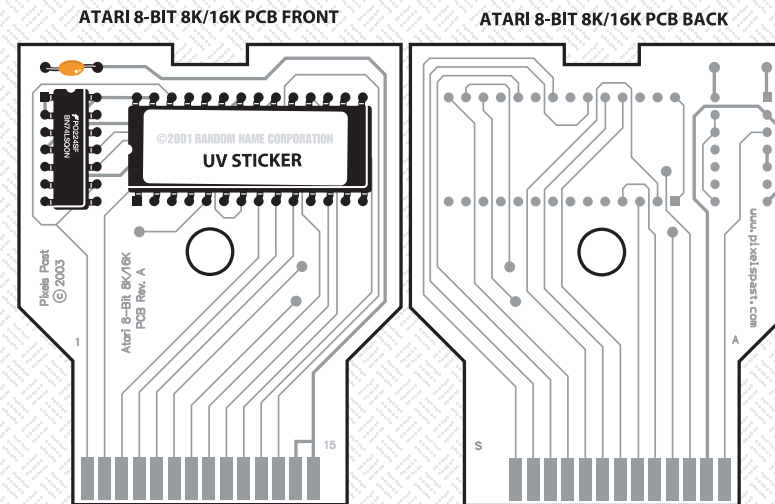
ASSEMBLY INSTRUCTIONS:

Assembly of the Atari 8-bit 8K/16K PCB is simple, but requires basic soldering skills. The order of parts placement and soldering of the devices onto the PCB is 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 for more information.

1. Insert and solder U1 to the front side of the board. 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.
2. If a 16K game is desired, simply insert and solder U2 to the front side of the board. If an 8K game is desired, U2 is not used. Instead, insert and solder a jumper wire between pins 10 and 11 of U2 (denoted by an "X" on the PCB).
3. Insert and solder C1 into place. C1 should be a small-footprint axial leaded device in order to fit properly onto the circuit board and into the cartridge housing.

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



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THEORY OF OPERATION:

The Atari 8-bit home computer systems were designed to support up to a 16KB ROM cartridge without special circuitry. The logical mapping of the cartridge is divided into two 8KB sections. The system knows the size of the cartridge (either 8K or 16K) based on the high or low voltage level of two pins on the cartridge (RD4, pin A and RD5, pin 14). Two active-low chip-select lines (/S4, pin 1 and /S5, pin 12) from the Atari 8-bit are used to enable the first 8K or second 8K section of a special ROM (Read-Only Memory) device.

For a 16K game, a series of NAND logic gates inside of U2 are used to "merge" the /S4 and /S5 chip-select lines into a Chip Enable (/CE) line usable by the EPROM memory device (Erasable Programmable Read-Only Memory, which are erasable with UV light and reprogrammable) which holds the game program binary. One gate inside U2 is used to set RD4 to a logic high to notify the Atari 8-bit system that the cartridge is 16KB in size.

If only an 8K game is desired, the functions of U2 are not needed and are bypassed by connecting pins 10 and 11 together. Without U2, the value of RD4 is set to a logic low to notify the Atari 8-bit system that the cartridge is only 8KB in size.

C1 serves as a bypass/decoupling capacitor to help reduce electrical noise on the power supply line coming from the Atari 8-bit computer system. The circuit will function without C1, but voltage spikes could cause irregularities in cartridge operation, so it is highly recommended that it be installed.

NOTES:
