

Atari 2600 Development System/Cart Reader by Peter Rittwage

Subject: Announcement: Atari 2600 development system you can build yourself!
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Dear fellow collectors/tinkerers...

I am in the final phase of completing a home built Atari 2600 development system. The unit consists of two parts: 1) the base unit which plugs into a standard PC parallel port, and 2) an SRAM cartridge which resides in a standard 2600 cart shell. The cartridge is backed up by a lithium cell battery so that once the cart is programmed, it will hold it's code for up to 10 years (theoretically). The cart supports up to 8k, which can consist of either one 8k game, or 2x4k games (hardware switchable). This design won't currently support 4x2k games, only 2x2k.

The unit is based in part on a design posted by Randy Smith in the summer of 1994, but I have rewritten the software and made slight changes to the hardware to assist in dealing with various bank switch methods used by psychotic 2600 programmers. I have been unable to locate Randy to thank him for his help last year, so if you're out there, e-mail me!

Features! -----

The unit can dump cartridges into files on your PC in several formats:

- A) My own .VCS format, with a header including fields for cart name, manufacturer, copyright date, label variation, bank switch method, and dump date.
- B) "Atari Action Pack" .BIN format (for use with the Activision emulator)
- C) Raw binary files with no header.
- D) 16 column hex dump files.

The unit can also transfer files from your PC to the SRAM cart (up to 8k). This lets you assemble and dump your own code to the unit for quick turnaround tinkering. It will also read/write the .VCS format, the "Action Pack" format, raw binary, and hex dumps. (Yes, you can play some of the action pack games on a real 2600-- sort of... They don't all work for some reason, but I am working on why. Probably bank switching problems)

You can also modify the games before they are sent to the SRAM cart to modify number of lives, etc. similar to the way the "Game Genie" works. Functions are being added to aid in finding key addresses.

Anyway, to make a long story short. I will be setting up a web page to detail all of this, including schematics, support software, example code, etc. Please understand I am not a 2600 programmer (read: torture), so the example code is crude, but I have developed a basic 6502/6507 assembler just to mess around with it. The entire development cycle takes about 1 minute total.

This design could probably easily be altered to work with ColecoVision carts, since they are similar in nature to the 2600 carts, but I will leave that to other fellow hardware hackers out there as my wife is probably tired of my obsession with these things. Plus I believe the ADAM already provides this functionality to the Coleco if you're creative.

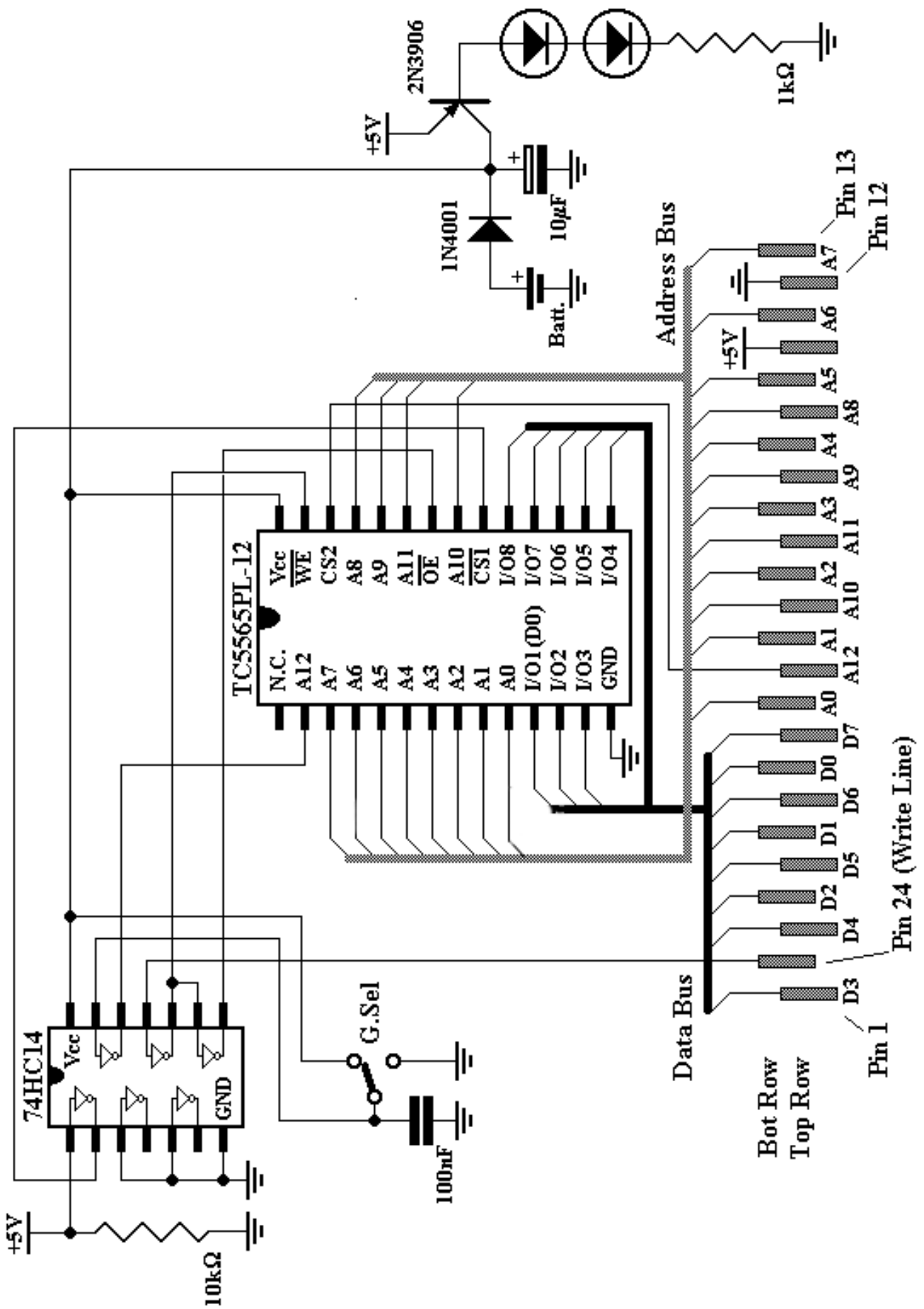
So, I'm done with my ramblings for now. E-Mail me if you're interested in helping along with expanding the compatibility with more 8k carts. As soon as I draw up the schematics I will post them. Total cost is about \$10 for the base unit, and \$10 per SRAM cart at the most... plus about 8 hours of soldering!

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Software: cart.exe (Atari 2600 Development System/Cart Reader/ROM Manipulation Software)
Version 3.0 (3/2/96) (C) 1995, 1996 by Peter Rittwage, All Rights Reserved.

SRAM CART - 8k*8 CHIP (Maximilian Luppe)



74374

8-bit 3-state D flip-flop.

+-----+				+-----+									
/OE	1	+++	20	VCC	/OE	CLK	D	Q	0	:	logic low level		
Q1	2		19	Q8	+-----+						1	:	logic high level
D1	3		18	D8	1	X	X	Z	X	:	don't care, either 0 or 1		
D2	4		17	D7	0	/	0	0	Z	:	high impedance		
Q2	5	74	16	Q7	0	/	1	1	/	:	rising clock input		
Q3	6	374	15	Q6	0	!/	X	-	!/	:	not a rising edge		
D3	7		14	D6	+-----+						-	:	no change
D4	8		13	D5									
Q4	9		12	Q5									
GND	10		11	CLK									
+-----+													

The last one is 74157:

74157

4-of-8 noninverting decoder/demultiplexer.

+-----+					
S	1	+++	16	VCC	
1A0	2		15	/EN	
1A1	3		14	4A0	S = 0: xY <- xA0
1Y	4	74	13	4A1	S = 1: xY <- xA1
2A0	5	157	12	4Y	
2A1	6		11	3A0	
2Y	7		10	3A1	
GND	8		9	3Y	
+-----+					

The first '374 stores the lower address (A0-A5 -> DP0-DP5), the A12 address line (DP6) and a SEL line (DP7). This SEL line will select the two nibbles of the data to be read from the cart (0 -> D0-D3 / 1 -> D4-D7) through the Status Register from Parallel Port.

The second '374 stores the upper address (A6-A11 -> DP0-DP5), the WRITE control (DP6) of the Cart and the OE control (DP7) of the third '374.

The third '374 stores the data to be written to the Cart.

The '374s are controlled by the AUTO, STROBE and INIT lines of the Parallel Port. The sequences to write and read the cart are:

-WRITE:

- Send data to Parallel Port Data Register (378h or 3BCh)
- Clock (0 -> 1 -> 0) the INIT line
- Send lower address to Parallel Port Data Register, A12(0)* and SEL(X)
- Clock (0 -> 1 -> 0) the AUTO line
- Send upper address to Parallel Port Data Register, WRITE(1) and OE(0)
- Clock (0 -> 1 -> 0) the STROBE line
- Send upper address to Parallel Port Data Register, WRITE(0) and OE(1)
- Clock (0 -> 1 -> 0) the STROBE line

-READ:

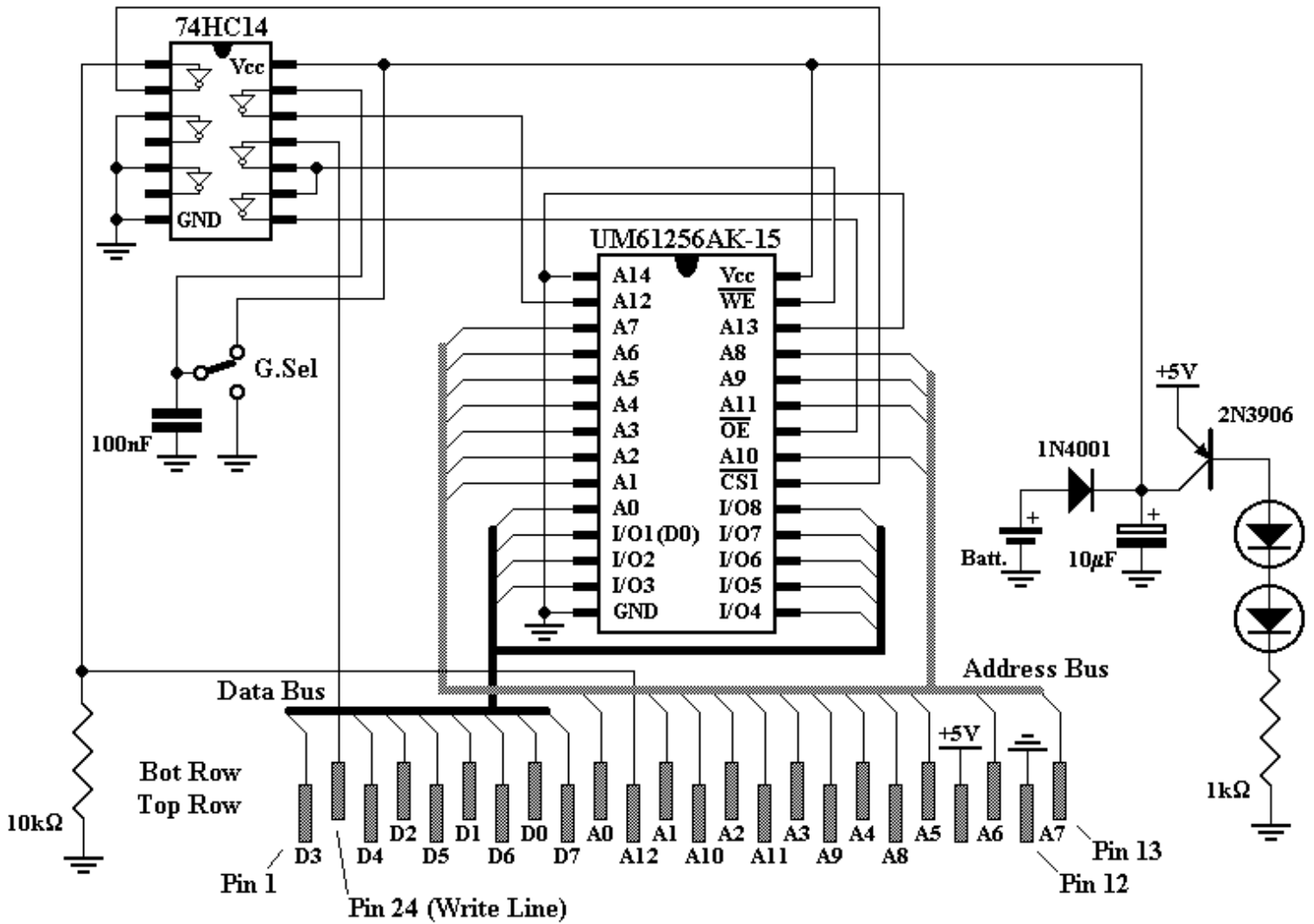
- Send lower address to Parallel Port Data Register, A12(0)* and SEL(0)
- Clock (0 -> 1 -> 0) the AUTO line
- Send upper address to Parallel Port Data Register, WRITE(0) and OE(1)
- Clock (0 -> 1 -> 0) the STROBE line
- Read Parallel Port Status Register (379H or 3BDh) (lower data)
- Send lower address to Parallel Port Data Register, A12(0)* and SEL(1)
- Clock (0 -> 1 -> 0) the AUTO line
- Read Parallel Port Status Register (379H or 3BDh) (upper data)

*The A12 line enables download two games to the cart. The game will be selected by the G.Sel switch in the 4KCART.PCX file.

Any 8kx8 SRAM can be used, like 5564 and 6264.

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SRAM CART - 32k*8 CHIP (Maximilian Luppe)



17 de Agosto de 2001. Córdoba, Argentina.

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(no se responsabiliza por el uso de esta información o los posibles daños que cause su empleo)