

# Thanks for purchasing the Dorktronic Mini Vic-20 32KB RAM Expansion!

Here is some info to help you use your board.

## THIS EXPANSION CARD FEATURES

- 32KB RAM in four(4) 8K banks (BLK1, BLK2, BLK3, BLK5 shared with RAM1-3)
- Accessible DIP switches while cartridge is inserted.
- Easily switch between 3K, 8K, 16K, 24K and 32K modes.
- READ-ONLY switch disables writes to RAM for use with copy-protected cartridge images.
- Right-angle mounted RESET button. Easy to find and press.
- Doesn't stick out from your VIC! Fits snugly inside the cartridge port.
- Angled grips for easy install and removal.
- Can be mounted inside a cartridge case (although switches will be inside too).

## SELECTING THE RAM BANKS WITH THE DIP SWITCHES

**Switch 1:** READ-ONLY -- The UP position is for Read/Write mode. DOWN is for Read-Only mode.

**Switch 2:** ENABLE CARD -- The UP position enables the RAM expansion. DOWN disables the RAM expansion, leaving your VIC in unexpanded mode.

**Switch 3:** BLK1(\$2000-\$3FFF) -- The UP position **disables** BLK1. DOWN **enables**.

**Switch 4:** BLK2(\$4000-\$5FFF) -- The UP position **disables** BLK2. DOWN **enables**.

**Switch 5:** BLK3(\$6000-\$7FFF) -- The UP position **disables** BLK3. DOWN **enables**.

**Switch 6:** BLK5(\$A000-\$BFFF) -- The UP position **disables** BLK5. DOWN **enables**.

**Switch 7:** RAM1-3(\$0400-\$0FFF) -- The UP position **disables** RAM1-3. DOWN **enables**.

## STANDARD RAM SELECTION SETTINGS

- Switches 3,4,5,6 DOWN and 7 UP -- 32KB mode (BLK1,BLK2,BLK3,BLK5)
- Switches 3,4,5 DOWN and 6,7 UP -- 24KB mode (BLK1, BLK2, BLK3)
- Switches 3,4 DOWN and 5,6,7 UP -- 16KB mode (BLK1, BLK2)
- Switches 3 DOWN and 4,5,6,7 UP -- 8KB mode (BLK1)
- Switches 7 DOWN and 3,4,5,6 UP -- 3K mode (RAM1-3)

## RAM SHARING

With its BLK1-5 and RAM1-3 lines, the VIC-20 supports a maximum possible expansion of 35K. In order to provide the most flexibility as to where the expansion's 32K is mapped, DIP switches #6 and #7 can be set to share the last bank of RAM (BLK5 at \$A000) with the 3K bank (RAM1-3 at \$0400).

What this means is, if you have both switches enabled(DOWN), a write into the \$0400-\$0FFF range will also be accessible in the \$A000 range (\$A400-\$AFFF) and vice-versa. In most cases you won't want to have both switch 6 and switch 7 enabled, although it doesn't hurt anything if you do.

## TESTING MEMORY

When starting up your VIC-20, the computer will only report BASIC RAM free. This is a maximum of 24KB. The other 8K is in a different address range \$A000-\$BFFF.

This short BASIC program will test your 32K RAM expansion (BLK1-BLK5). When running this program it will first show the address area it is testing followed by 16 Os or Xs.

An 'O' means that page of memory is OK and writeable, while an 'X' means that area of memory is unwriteable. NOTE: It takes a few minutes to run since it is written in BASIC.

```
10 B=1:C=B+48
20 B=B+1:IF B=12 THEN END
30 C=C+1:"$";CHR$(C);"000:";
40 A=B*4096:E=A+4095
50 FOR I = A TO E STEP 256
60 FOR J = 0 TO 255
70 POKE I+J,25
80 IF PEEK(I+J) <> 25 THEN ?"X";:GOTO 110
90 NEXT J
100 ?"O";
110 NEXT I
120 IF B=7 THEN B=9:C=55+B
130 GOTO 20
```

## LOADING A CARTRIDGE IMAGE

You will need a storage device (disk, tape, uIEC) to load a cartridge image into RAM. I have a uIEC/SD (<http://store.go4retro.com/uiec-sd>). Here's how I use it to play cartridge games.

1. On a PC, download cartridge images from [zimmers](http://www.zimmers.net/anonftp/pub/cbm/vic20/carts/index.html) or elsewhere and store them on an SD card.
2. Make sure the VIC is powered off.
3. Attach the uIEC to the VIC (if necessary) and insert the SD card.
4. Set the RAM expansion to 32K mode (see above), and install the RAM into the cartridge slot.
5. Turn everything on and at the READY prompt, load a cartridge image. **LOAD "SOMEGAME",10,1**
6. When the game is loaded, it should return saying READY.
7. Press the reset button on the RAM expansion to start the game.