

# PMB Electronics (Net-Tech Developments)

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## PRODUCT NOTE

DATE: 05-Feb-2000 FILE: buff\_p1.pdf

## BUFFALO FOR CPU\_1A1 & CPU\_1B

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### INTRODUCTION

This is a direct port of Buffalo Rev. 3.4 to operate on the CPU\_1A1 and CPU\_1B 68HC11 boards. All commands and features of Rev. 3.4 remain unchanged.

The file and revision have been changed to "P1" to reflect the changes.

Buffalo can be installed using the Win95 Loader or the Qbasic loader. A terminal program such as HyperTerminal, set to 9600 baud must be connected to the CPU board to make use of Buffalo.

### INSTALLATION

To install to the CPU\_1A1 or CPU\_1B module:

- Power down
- Connect serial link to PC
- Insert links for bootstrap mode
- Power up
- Initialise HC11
- Load and verify (run) the erase.hex file
- Wait for erase to complete led starts flashing
- Reset the HC11
- Initialise HC11
- Load the buff\_p1.hex file verify/run not essential
- Power down
- Remove links for expanded mode
- Power up to run buffalo message appears (HyperTerminal)

### HOW IT WORKS

Buffalo runs in expanded mode. The reset and interrupt vectors are located in EEPROM at the top of the memory map. Buffalo itself is located in Flash memory, starting at \$8000. The CPU registers are located at \$1000. Zero page RAM is mostly taken up by Buffalo variables and an interrupt jump table.

When power is applied, the HC11 is reset. It gets the reset vector from EEPROM at address \$FFFE-\$FFFF and starts executing code at \$FE80. This code, also located in EEPROM, configures the external Flash and RAM memory then jumps to Buffalo in Flash.

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Code under development can be loaded and tested in RAM. You can call on subroutines within Buffalo. See the listing file (buff\_p1.lst) for routines and addresses.

Buffalo does not take advantage of the additional banks of Flash memory that are available.

## MEMORY MAP

\$0000-\$00FF	RAM, zero page	mostly used by Buffalo
\$0100-\$03FF	RAM, inside cpu	
\$0400-\$0FFF	RAM, external	
\$1000-\$105F	RAM, cpu registers	
\$1060-\$7FFF	RAM, external	test your programs here
\$8000-\$CFFF	Flash, available	see note 1
\$D000-\$FDFE	Flash, buffalo	
\$FE00-\$FF7F	EEPROM, available	
\$0100-\$03FF	EEPROM, boot code	do not erase or change

### Notes:

1. If you use the Flash memory to store your own programs, erasing Flash will also erase Buffalo.

## FILES

buf_p1.asm	source file for AS11 or MiniIDE
buf_p1.lst	assembled listing
buf_p1.hex	S19 file for HC11
buff_p1.pdf	this document

For more information or assistance, contact [paul@pmb.co.nz](mailto:paul@pmb.co.nz)