

EE 361 LAB 1
MC68HC11 Introduction

References: Software and Hardware Engineering: Motorola M68HC11 chapter 5, MC68HC11 Programming Reference Guide

Pre-Lab: Read Chapter 5: Buffalo Monitor and Debugger

1 Using the Buffalo Monitor, assemble the following program to be at \$C000. After it is in and you have checked that it is OK, run the program. (Note: Use <Ctrl-A> to get out of the ASM mode.)

Program	Comment	Enter in ASM	What's in Memory	
		ASM C000	Location:	Contents
LDAA ':'	Load ASCII code for :	LDAA #3A	c000:	86 3a
JSR OUTA	Print it on terminal	JSR FFB8	c002:	bd ff b8
JSR INCHAR	Get a new character	JSR FFCD	c005:	bd ff cd
LDAB #5	Initialize loop counter	LDAB #5	c008:	c6 05
LOOP JSR OUTA	Print the character	JSR FFB8	c00a:	bd ff b8
DECB	Decrement loop counter	DECB	c00d:	5a
BNE LOOP	If counter <> 0, repeat	BNE C00A	c00e:	26 fa
SWI	Return to the monitor	SWI	c010:	3f
		<Ctrl-A>		

- 1.1 What does this program do?
- 1.2 Change the ":" prompt to a "\$".
- 1.3 Change the loop counter so it prints exactly 15 of them.

2 Using elements of this program and other monitor utility routines, write, assemble and demonstrate a program which conforms to the following design:

```
Input character from the keyboard
Add 1 to the character
Print +1=
Print the character to which 1 was added
End program
```

Example. If you had entered the character A, the program display should show A+1=B. Demonstrate the program to your lab instructor.

- 3 Memo Report
 1. Define the following terms: a) Breakpoint b) Branch address, c) Buffalo Monitor
 2. What Buffalo Monitor command do you use to display memory?
 3. How do you use the Buffalo Monitor to set a breakpoint?
 4. Explain in detail what each line of code does in the program in 2. Give the hexadecimal code for each instruction in the program.
- 4 Grading: Program demo 5 points, memo report 20 points.