Capstone Design Course

Lecture-4: EVBU Board

By

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CME-11E9-EVBU Board
CME-11E9-EVBU Board
### Memory Map

<table>
<thead>
<tr>
<th>Address</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7FFF</td>
<td>Data Memory</td>
</tr>
<tr>
<td></td>
<td>RAM in U5</td>
</tr>
<tr>
<td>1040</td>
<td>68HC11 Internal Registers</td>
</tr>
<tr>
<td>103F</td>
<td>See 68HC11 Technical Data Manual</td>
</tr>
<tr>
<td>1000</td>
<td>Data Memory</td>
</tr>
<tr>
<td>0FFF</td>
<td>RAM in U5</td>
</tr>
<tr>
<td>0200</td>
<td>68HC11 Internal RAM in U1 - (42-FF reserved by Buffalo Monitor)</td>
</tr>
<tr>
<td>01FF</td>
<td></td>
</tr>
<tr>
<td>0000</td>
<td></td>
</tr>
</tbody>
</table>
Memory Map (contd.)

RESET Vector Address

Memory Socket U7 (8K device) if ROMON disabled
Mode Select Jumpers

<table>
<thead>
<tr>
<th>MODA</th>
<th>MODB</th>
<th>Mode of Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ON</td>
<td>ON</td>
<td>Special Bootstrap / Programming</td>
</tr>
<tr>
<td>OFF</td>
<td>ON</td>
<td>Special Test</td>
</tr>
<tr>
<td>ON</td>
<td>OFF</td>
<td>Normal Single Chip</td>
</tr>
<tr>
<td>OFF</td>
<td>OFF</td>
<td>Normal Expanded (default)</td>
</tr>
</tbody>
</table>
Programming Jumpers

- Programming the external EEPROM memory is performed by installing MODA and MODB jumpers and the WRITE_EN jumper.
- After programming, remove the WRITE_EN jumper before applying RESET or removing power from the board.
Buffalo Monitor Commands

ASM [<address>]
BF <addr1> <addr2> <data>
BR [-] [<address>]...
BULK
BULKALL
CALL [<address>]
G [<address>]
HELP
LOAD T
MD [<addr1> [<addr2>]]
MM [<address>]
MOVE <addr1> <addr2> [,dest>]
P
RM[p,y,x,a,b,c,s,]
T [<n>]
VERIFY T

- Address and data values should be given in Hex notation, for example: asm 2bf0
Installing AXIDE Software

Other Materials of ECE4600

- AXIDE Software for the CME-11E9-EVBU Board
- Projects of ECE4600
- Programs
- 68HC11 Registers
- Interrupt Vectors
- Programming the External EEPROM
- Configuring the Board back to the Buffalo Monitor Mode
Creating a Source File

- Use any text editor, such as the Notepad or DOS Editor, to create a source file.
- Don’t use more than 8 Characters for file name.
Building Program (Assembling Program)

- If the file shown in the following window is not the right file, then select the appropriate source file by clicking on the **Browse** button.

![Assemble Code dialog box](image)

**Assembly source code file:**

```
C:\Mahmud\ECECourses\ECE4600\TestProg.txt
```

**NOTE:** This assembler **DOES NOT** support long path names.

**Listing Options**

- Output Cross Reference Table
- Output Symbol Table
- Enable Cycle Counting

![Assemble Code dialog box](image)
.lst and .S19 Files

- If there are no syntax errors then AXIDE will display a program listing with assembled code. Otherwise, some errors will be indicated.

- The assembler will also create a .S19 file (S-record file) if there are no errors.
Display After Pressing the RESET Button of the 68HC11 Board
Uploading .S19 File to the 68HC11 Board

1. Type **Load T** and press **Enter** key.
Uploading .S19 File (contd.)

2. Click on **Upload** button and select the .S19 file, and then click on the **OK** button.
3. You will see the following display on the screen after the upload operation is completed.
Running the Program

4. Since our code starts from location $1040$, we run the program by typing G 1040.
Buffalo Monitor Commands

MD (Memory Display)

BUFFALO 3.4 (ext) - Bit User Fast Friendly Aid to Logical Operation
>md 1040

```
1040 CE 10 00 1F 00 01 05 1D 00 10 20 F7 1C 00 10 20
1050 F2 BF FF 7F 9F 6F 3F FF FF AF EE DF EF FF FF F7 o?
1060 FF FF 7F FF FF DF 7F F7 F6 FF 3F D7 FF 7D F6 FD ?
1070 9F FF 5D FC FF 7F FF FB F9 DE FF FF 7F FF EE ]
1080 08 12 08 02 C2 20 00 81 16 40 81 04 10 08 96 40 0 0
1090 C1 00 00 80 10 53 12 08 01 00 00 29 42 10 11 0A S )B
10A0 18 0B 00 00 00 14 5A 00 14 08 10 04 10 12 01 40 Z 0
10B0 28 14 40 07 01 8F 00 06 02 06 C0 10 06 08 92 40 ( 0 0
10C0 04 D4 12 0C 05 00 50 10 15 04 C4 59 00 02 01 0A P Y
>```

Buffalo Monitor Commands (contd.)

ASM (Memory Disassemble)

BUFFALO 3.4 (ext) - Bit User Fast Friendly Aid to Logical Operation

>asm 1040

1040 LDX #$1000

1043 BRCL $00,X $01 $104C

1047 BCLR $00,X $10

104A BRA $1043
RM (Register Modify)

BUFFALO 3.4 (ext) - Bit User Fast Friendly Aid to Logical Operation

>rm
P-2000 Y-FFFF X-FFFF A-34 B-FF C-DO S-0041
P-2000 3400

>rm a
P-3400 Y-FFFF X-FFFF A-34 B-FF C-DO S-0041
A-34 5a

>rm x
P-3400 Y-FFFF X-FFFF A-5A B-FF C-DO S-0041
X-FFFF 4000

>rm
P-3400 Y-FFFF X-4000 A-5A B-FF C-DO S-0041
P-3400