

## ET 386L

## Lab 7 Input Operations Port E, Port C

(To be used with separate LED array and Push buttons)

1. Connect the input/output assembly to the 68HC11 EVBU.
2. Refer to the pin diagram and schematic of the input/output assembly for connection details.
3. Create assemble, make appropriate comments and save the following program:

```

ORG    $0100    ;
** Prepare Port C **
    LDAA    #$FF    ;Port C configured for output
    STAA    $1007    ;address of data direction register C
** Main body **

WATCH LDAB    $100A    ;
    STAB    $1003    ;
    BNE     WATCH    ;

    LDAA    #$00    ;
    STAA    $1003    ;
    LDX     #$FFFF    ;

HIGH   DEX      ;
    BNE     HIGH    ;

    LDAA    #$FF    ;
    STAA    $1003    ;
    LDX     #$FFFF    ;

LOW    DEX      ;
    BNE     LOW     ;
    JMP     WATCH   ;
END

```

- When will the process or exit the “Watch” loop?
- In the “Watch” loop, substitute the BNE command with BEQ. With this new command, when will the processor exit the “Watch” loop?
- Replace the BNE in the “Watch” loop. Modify the program so that when the processor exits the “Watch” loop, all the LEDs will blink 3 times and then return to the “Watch” loop.

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|----|--------------------|--------|--------------------------------------|
| 7. | New commands:      | BEQ:   | branch if equal to zero              |
| 8. | Important address: | \$1004 | address of Port B (for output)       |
|    |                    | \$100A | address of Port E (for input)        |
|    |                    | \$1007 | address of data direction register C |
|    |                    | \$1003 | address of Port C(for output)        |