

İTÜ



Department of Computer Engineering

BLG 351E Microcomputer Laboratory Experiment Report

Experiment No :

Experiment Date :

Group Number : -

Group Members :

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1 INTRODUCTION

In this experiment, we were expected to implement the program that drives 16x2 dot matrix LCD on the experiment board. Our program was going to use a predefined char array as an input and display the string using LCD.

2 EXPERIMENT

In this experiment, we were expected to write "ITU - Comp . Eng. MC Lab. 2016 " on LCD. For this purpose, first we have initialized registers to assign true connections of LCD.

By doing this, we saw that LCD backlit has no problems.

Then we have tried to implement right code to make the given string written on LCD. Actually, we have failed. But we have completed the initialization process defined at the experiment booklet.

Here are our code:

```
Setup    bis.b  #0FFh,&P1DIR
         bis.b  #0FFh,&P2DIR

inLCD    call  #Delay      ;1
         mov   #030h,&P1OUT;2
         call  #TriEN
         call  #Delay
         mov   #030h,&P1OUT;3
         call  #TriEN
         call  #Delaym
         ;4
         mov   #030h,&P1OUT
         call  #TriEN
         call  #Delaym
         ;5
         mov   #020h,&P1OUT
         call  #TriEN
         call  #Delaym
         ;6
         mov   #020h,&P1OUT
         mov   #080h,&P1OUT
         call  #TriEN
         call  #Delaym
         ;7
         mov   #000h,&P1OUT
         mov   #080h,&P1OUT
         call  #TriEN
         call  #Delaym
         ;8
         mov   #000h,&P1OUT
         mov   #010h,&P1OUT
         call  #TriEN
         call  #Delay
         ;9
         mov   #000h,&P1OUT
         mov   #060h,&P1OUT
```

```

    call #TriEN
    call #Delaym
;11
    mov #000h,&P1OUT
    mov #0C0h,&P1OUT
    call #TriEN
    call #Delaym
    mov.b #040h,&P1OUT
    call #TriEN
    mov.b #010h,&P1OUT
    call #TriEN
sCMD  bic.b #080h,&P2OUT
      mov #000h,&P1OUT
      call #TriEN
      bic.b #080h,&P2OUT
      mov #007h,&P1OUT
      call #TriEN
sDATA bis.b #080h,&P2OUT
      mov #'a',&P1OUT
      call #TriEN
      bis.b #080h,&P2OUT
      mov #007h,&P1OUT
      call #TriEN
TriEN bis.b #040h,&P2OUT
      call #Delaym
      bic.b #040h,&P2OUT
      ret
Delay  mov.w #19100d, R14 ;more than 100ms delay
Lb2    dec.w  R14
      jnz    Lb2
      ret

Delaym mov.w #20d, R14 ;more than 100us delay
Lb2m   dec.w  R14
      jnz    Lb2m
      ret

string .data
      .byte "ITU",0Dh,"COMPUTER SC.",00h

```

What we have done in this part is given in the chart below:

Character Mode Liquid Crystal Display Module Initialization by Instruction (8-bit data interface)

Notes:

RS = 0 to select the Instruction register.

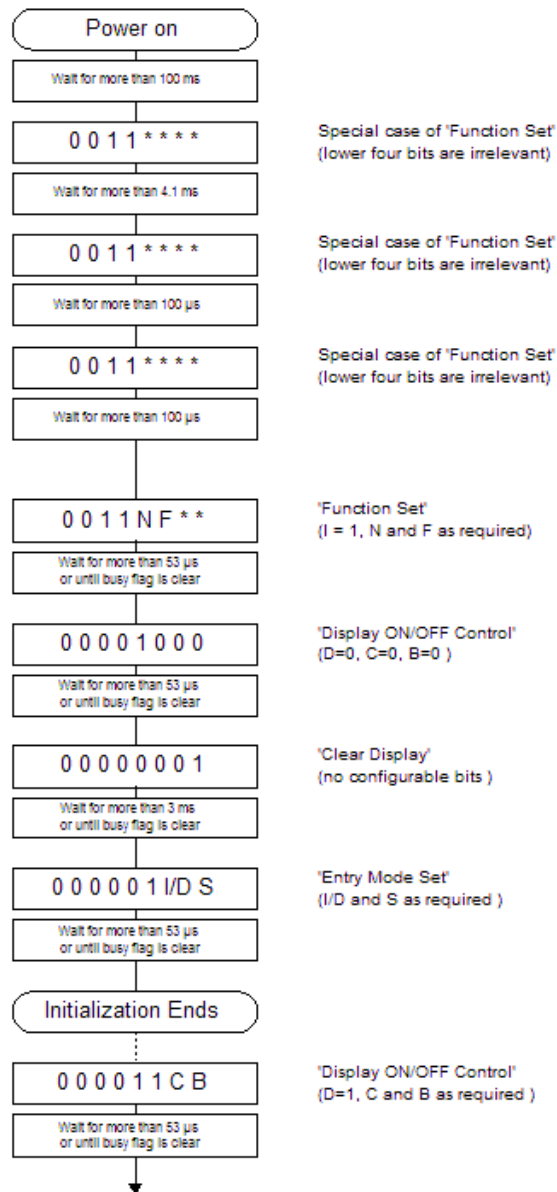
R/W = 0 so that data is written to the LCD module.

The second 100 μ s time delay is not documented, this figure is speculation, it may be possible to check the busy flag here.

N and F must be set in the first non-special Function Set instruction and cannot be changed subsequently

All time delays specified after the Function Set are based on worst case instruction execution time (clock may be as low as 190 kHz).

The first Display ON/OFF Control instruction should probably be performed as specified (some programmers set D, C, and B here).



3 CONCLUSION

To sum up, we have failed completing this experiment for some reasons. The most significant reason we think that missing informations. This is a common fact we got used to in ITU CE, a route is shown to students and students are expected to find the righteous way on by their own. But this time, in this experiment, we thought that even we are not told “there can be a route”.

Asking “How can we use this ‘string’ in code” is replied by “You ought to know that already”. We said “Hmm.”

We think most of the other students in Monday section have failed. This represents a statistical data that there is something wrong. We think problem is not only us.

Anyway, there were some other technical problems about MSP’s and kits, but we could quickly overcome.