EXPERIMENT NO: 9

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Title: Assembly Language Programming:

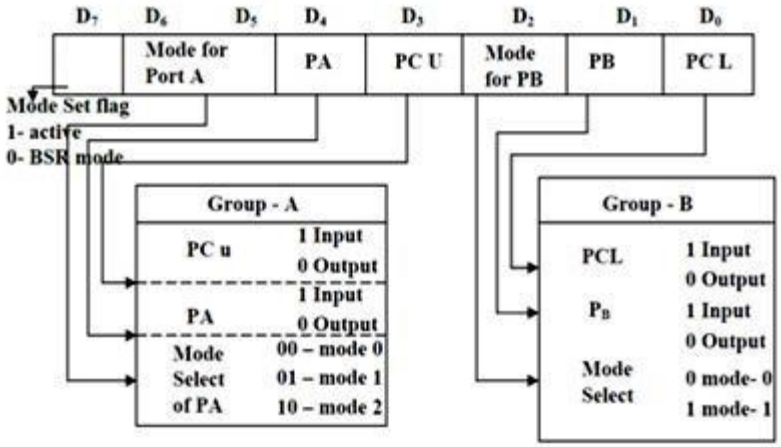
Interfacing 8255 with 8086 on KIT

EXPERIMENT NO:9
Assembly Language Programming

Objective: To enable any one of the ports on 8255 as Output port Software Used: Emu8086
Hardware Used: Dyna 8086 KIT
Problem Statement: To initialize 8255 by enabling Port A as output port to display 07H. Assume Port Address as 61H.

Theory:

/*Show the control word structure of 8255 and derive the control word value based on the inputs given.*/



Thus one may have either three 8-bit I/O ports or two 8-bit and two 4-bit ports from 8255. All of these ports can function independently either as input or as output ports. This can be achieved by programming the bits of an internal register of 8255 called as control word register (CWR).

- **D_0, D_1, D_3, D_4** are assigned for port C lower, port B, port C upper and port A respectively. When these bits are **1**, the corresponding port acts as an input port. For e.g., if $D_0 = D_4 = 1$, then lower port C and port A act as input ports. If these bits are **0**, then the corresponding port acts as an output port. For e.g., if $D_1 = D_3 = 0$, then port B and upper port C act as output ports.
- **D_2** is used for mode selection of Group B (port B and lower port C). When $D_2 = 0$, mode 0 is selected and when $D_2 = 1$, mode 1 is selected.
- **D_5 & D_6** are used for mode selection of Group A (port A and upper port C). The selection is done as follows:

D_6	D_5	Mode
0	0	0
0	1	1
1	X	2

- As it is I/O mode, **D_7** = 1.

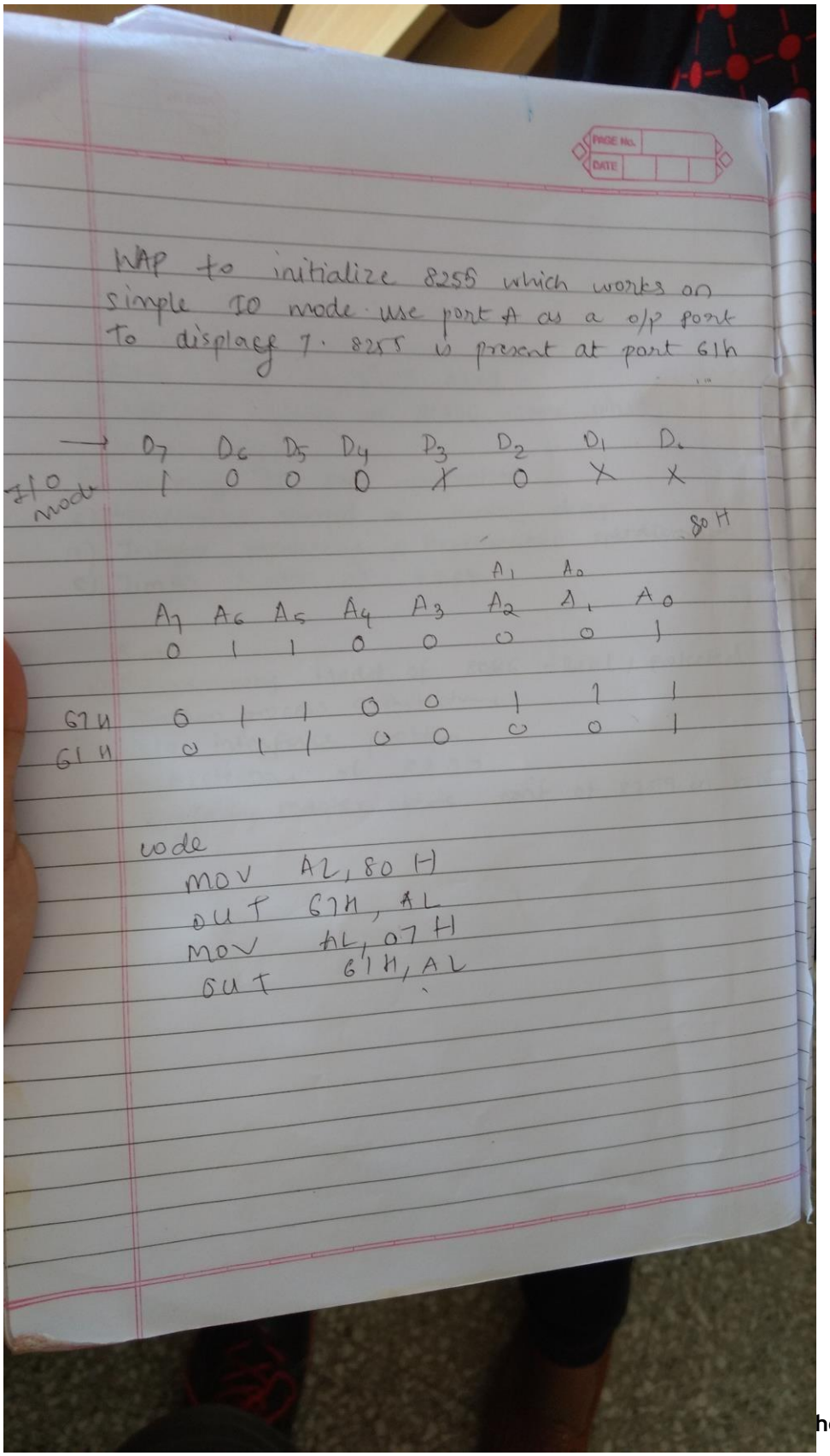
For example, if port B and upper port C have to be initialized as input ports and lower port C

and port A as output ports (all in mode 0):

1. Since it is an I/O mode, $D_7 = 1$.
2. Mode selection bits, D2, D5, D6 are all 0 for mode 0 operation.
3. Port B and upper port C should operate as Input ports, hence, $D_1 = D_3 = 1$.
4. Port A and lower port C should operate as Output ports, hence, $D_4 = D_0 = 0$.

Hence, for the desired operation, the control word register will have to be loaded with **"10001010" = 8A (hex)**.

Screenshots:-



WAP to initialize 8255 which works on simple IO mode use port A as a o/p port To display 7. 8255 is present at port 61h

→	D_7	D_6	D_5	D_4	D_3	D_2	D_1	D_0
I/O mode	1	0	0	0	X	0	X	X

80 H

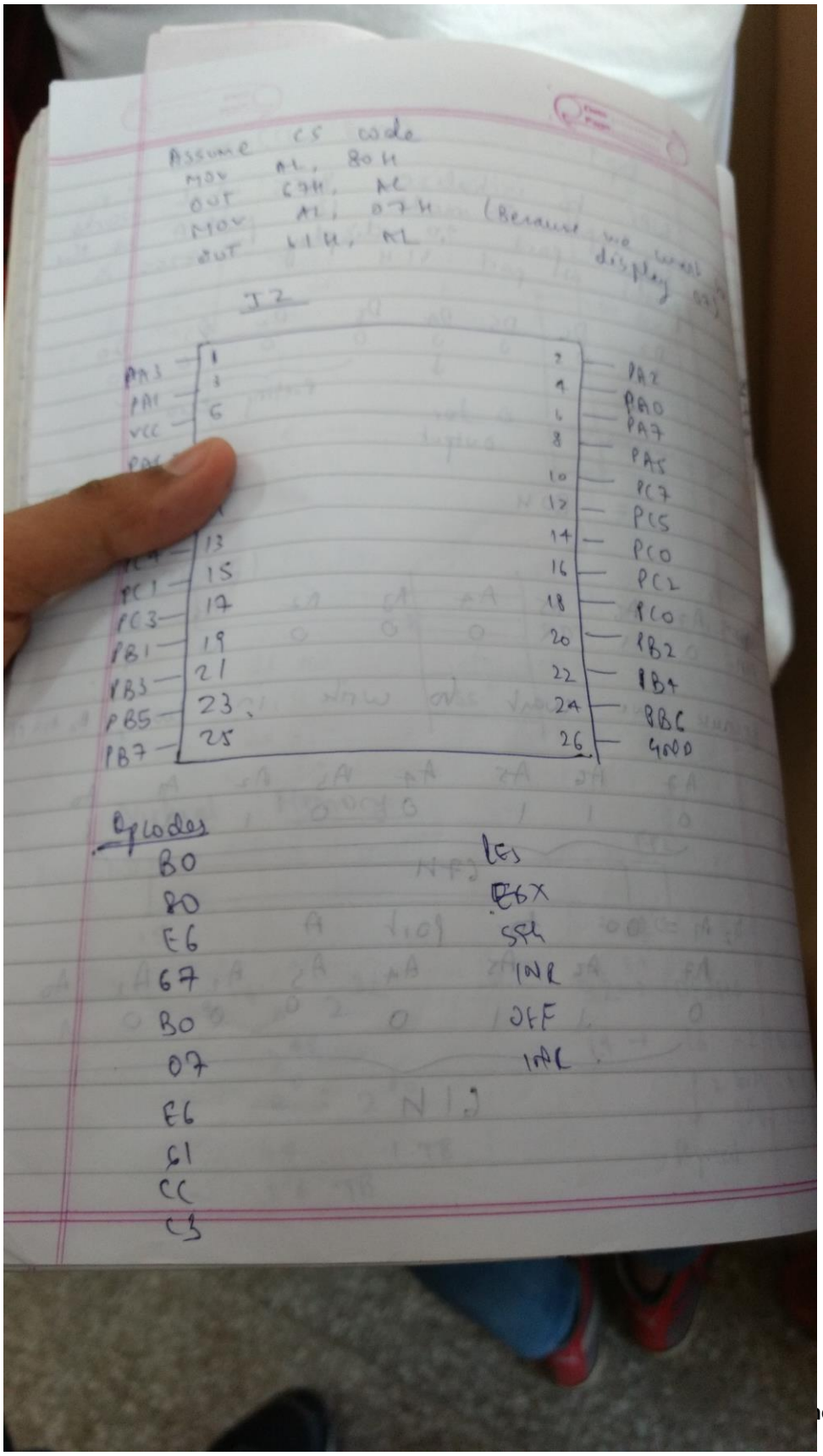
	A_7	A_6	A_5	A_4	A_3	A_2	A_1	A_0
	0	1	1	0	0	0	0	1
67H	0	1	1	0	0	1	1	1
61H	0	1	1	0	0	0	0	1

A_1 A_0

code

```
MOV  AL, 80 H
OUT  67H, AL
MOV  AL, 07 H
OUT  61H, AL
```

hese


Assume CS code
MOV AL, 80H
OUT 67H, AL
MOV AL, 07H (Because we want display OFF)
OUT 61H, AL
J2
PA3 1
PA1 3
VCC 5
13
PC1 15
PC3 17
PB1 19
PB3 21
PB5 23
PB7 25
2 PA2
4 PA0
6 PA7
8 PA5
10 PC7
12 PC5
14 PC0
16 PC2
18 PC0
20 PB2
22 PB4
24 PBC
26 GND
Opcodes
B0
80
E6
67
B0
07
E6
61
CC
C3
MOV
EBX
SUB
INR
OFF
INR

ese

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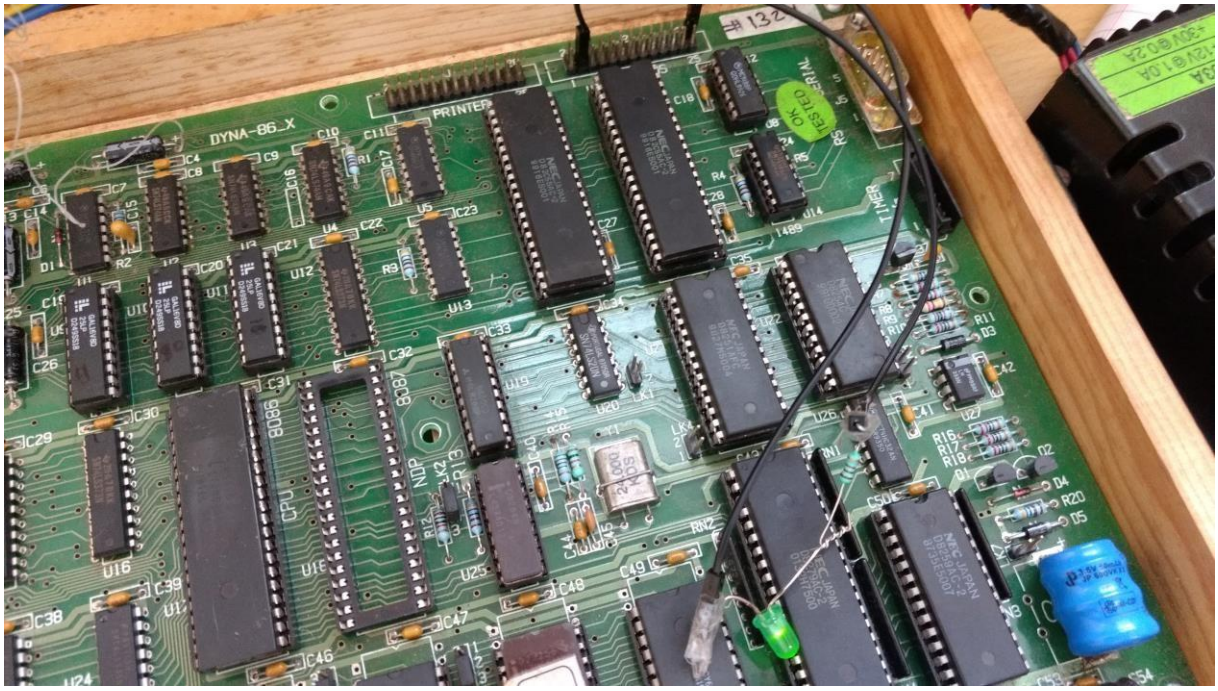
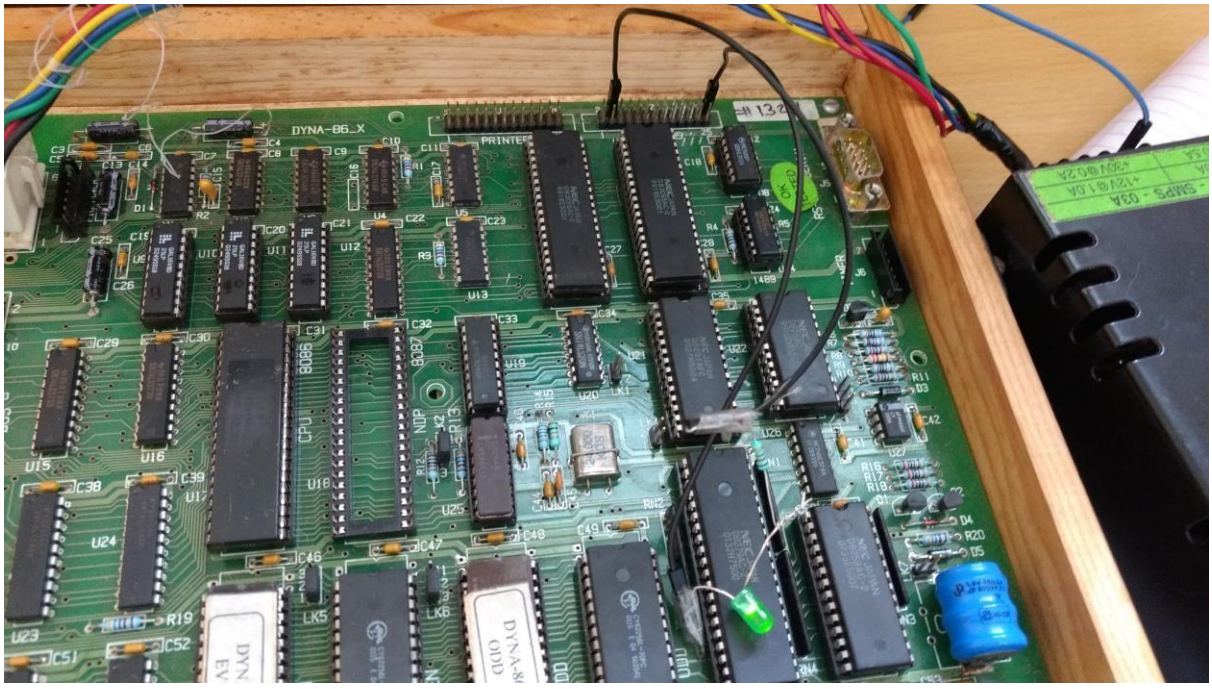
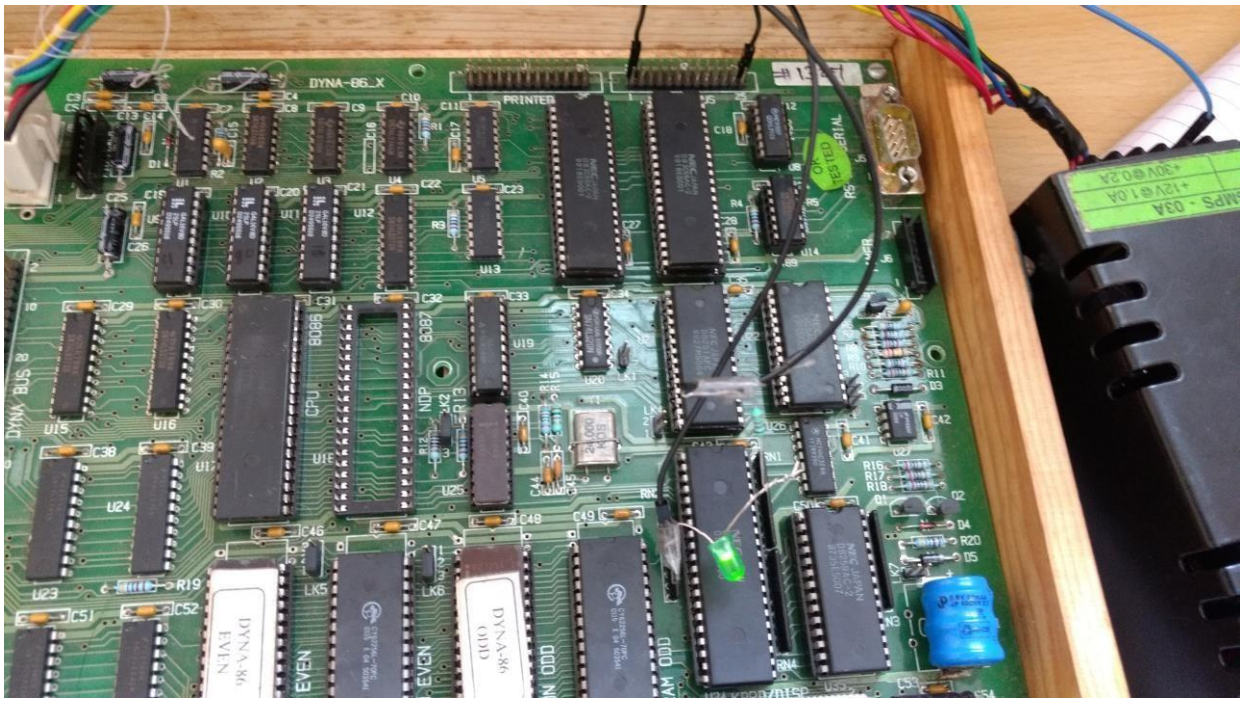




Class:T.E Comps(SemV) **Subject: Microprocessor** **Lecturer:Ditty Varghese**



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Conclusion:

The 8255A is a general purpose programmable I/O device designed to transfer the data from I/O to interrupt I/O under certain conditions as required. It can be used with almost any microprocessor.

It consists of three 8-bit bidirectional I/O ports (24I/O lines) which can be configured as per the requirement. Through the use of a kit we are able to perform operations that would have been difficult to solve otherwise.