

Quick start for 8086 Microprocessor kit

1. Memory and I/O layout

0x00000-0x3FFFF	256kB RAM
0xE0000-0xFFFFF	128kB Monitor ROM
00	GPIO1 LED
0x100	PORT0 input port
0x180	PORT1 output port
0x200	PORT2 output port
0x280	PORT3 74HC175
0x300	UART 8250
0x400	User expansion
0x500	LCD registers LCD_command_write 0x500 LCD_command_read 0x504 LCD_data_write 0x502 LCD_data_read 0x506

2. INT 3 instruction is used for software break point.

```
0400          ORG  400H

0400 B001  START  MOV AL,1
0402 E600          OUT 0,AL
0404 CC          INT 3
```

Example program writes register AL to gpio1 LED at 0. We can enter the hex code then press IP to 400 then GO. We will see the contents of register Al on the gpio1 LED easily.

Another example shows using key GO

```
0400          ORG 400H

0400 B001  START  MOV AL,1

0402 E600  LOOP  OUT 0,AL
0404 D0C0          ROL AL,1
0406 E80200        CALL DELAY
0409 EBF7          JMP LOOP
```

```

040B B90030  DELAY  MOV CX,3000H
040E E2FE           LOOP $
0410 C3           RET

```

Can you change speed? How?

3. Function keys:

RESET	Reset CPU and start the monitor program
TEST	Test the 10ms tick interrupt and speaker. SW1 must be 10ms position.
INTR	External interrupt signal. Vector must be defined by user.
REP	Repeat function keys when press together.
REG	Set display user registers. Use with hex key for a given user registers. Key D displays flag O D I S (Overflow, Direction, Interrupt, Sign) Key E displays flag Z A P C (Zero, Aux, Parity, Carry)
IP	Set display address to 400 after reset, set to current IP after service break point.
INS	Insert one byte and shift 512 bytes down
DEL	Delete one byte and shift 512 bytes up
STEP	Single step running, CPU registers will be save to user registers
GO	Jump from monitor program to user code
OFFSET8	Compute 8-bit offset byte, used with key + and GO. Enter Start address, Destination with key +, key GO will compute offset and write the offset byte.
OFFSET16	Compute 16-bit offset word, used with key + and GO. Enter Start address, Destination with key +, key GO will compute offset and write the offset word.

4. Install or remove the LCD must be done when the kit is POWER OFF! Blue POT is for contrast adjustment.

5. Serial port RS232 is 9600 8n1. RS232 cable is female both ends, cross cable type.

6. DC input can be as low as +7.5VDC. The kit provides +9VDC, 2.2mm positive center pin.

7. While operating, the CPU and 7805 will be HOT.

8. Kit connects terminal automatically with key ENTER. Serial monitor commands help is ? Key entered.

9. To use single step command with serial monitor, the SW1 must be set to INTR position.

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