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System Introduction

- i) ET-8085 is a microprocessor training and development kit designed around 8085 processor.
- ii) It is the most popular and very versatile processor.
- iii) It is easy to understand its architecture and assembly language programming.
- iv) ET-8085 kit communicates with outside world, 28-keys keyboard & 6-seven segment displays.
- v) System can also interact with user through its CRT terminal or PC/XT/AT computer I/F.
- vi) The monitor of ET-8085 is very powerful and provides various software commands like INSERT, DELETE, BLOCK MOVE, RELOCATE, STRING, FILL, MEMORY etc.
- vii) All address data and necessary control lines are brought through on 50pin PFI connector & these lines can also be used for interfacing ET-8085 to external hardware through the bus.

System / Hardware Specification

- i) CPU - 8 bit 8085 microprocessor.
- ii) XTAL frequency - 6.144 MHz.
- iii) RAM - 8k bytes with provision of expansion.
- iv) ROM - 32k bytes of EPROM with provision of expansion.
- v) MEMORY - total on board capacity of 64k bytes (through 2 additional memory sockets)
- vi) TIMER - 3 - 16-bit programmable timers / counter using 8253



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- vii) I/O LINES - 24 I/O lines using 8255 expandable to 46 I/O lines using one 8155
- viii) KEYBOARD - 28 keys keyboard : 10 keys for command, 16 keys for hexa-decimal data entry.
- ix) LED display - 6 seven segment display : 4 for address field and 2 for data field.
- x) Bus - All data, address & control signals compatible available at FR1 connector.
- xi) Interface - RS 232C through SFD/SOD lines with auto band rate
- xii) Power Supply requirement - 45V, 1.5A for kit (optional)
- xiii) operating temperature - 0 to 50°C

System Specification (software)

FT-8085 provides various software commands to achieve the following

- a) keyboard mode
- b) Serial mode.



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Introduction to hardware.

- a) GENERAL :- The system has got 8085 as the CPU. The clock frequency for the system is 3.07 MHz & is generated from a crystal of 6.144 MHz.
- 8085 has got 8 data lines and 16 address lines. The lower 8 address lines & 8 bit data lines are multiplexed. Since the lower 8 address bits appear on the bus during the first clock cycle of M1, 8 bit data appears on the bus during the first, 2nd and 3rd clock cycle, it becomes necessary to latch the lower 8 address bits during the 1st clock cycle so that the 16 bit address remains available in subsequent cycles. This is achieved using a latch 74-LS-373.
- b) Memory :- provides 64K bytes of RAM using 6116/6264 chip and 4K/8K bytes of EPROM for monitor using 2764. There are 2 memory spaces provided on 8085 for expansion. These spaces can be defined any address slot from 4000-FFF depending upon the address slot size of memory chip to be used. The memory space MEM2 can be used to define 6264/62256 whereas MEM3 can be defined to have 2764/128/256 EPROM.
- c) I/O DEVICES
- 8085 uses 8279, 8255, 8255 and 8155 peripheral chips.



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→ 8279 (keyboard and display controller)

8279 is a general purpose programmable keyboard and display I/O interface device designed for use with 8085 μ p. It provides a scanned interface to 28 contact keys matrix and 6 seven seg. displays. 8279 has got 16x8 display ram which gets refreshed automatically when a key is pressed, its corresponding code is entered in the FIFO queue of 8279 and can now be read by the μ p.

→ 8255 (Programmable peripheral Interface)

This acts as a general purpose I/O device to interface with peripheral device to the system. It is not necessary to have an external logic to interface with peripheral devices since the function config. of 8255 is programmed by the system software. It has got 3 I/P / O/P ports of 8 lines each (Port A, B, C). Port C can be divided into 2 parts of 4 lines each namely upper and lower. Any I/P / O/P combination of A, B, C upper, lower can be defined using the appropriate for these ports are also there. 8085 provides 24 I/P / O/P ports using 8255 chips.

→ 8253 (Programmable interval timer / counter)

This chip is used for the generation of accurate time delays under software control. Various other functions like that can be implemented with this chip are programmable rate generator, event counter, binary rate multiplier, real time clock, etc. This chip has got 3 independent 16 bit counter each having a count rate of 2MHz.



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The first time counter is being used for single step operation. However this connection are also bought at connector space 23 for single step operation. CLK signal of counter 2/0 is getting a clock frequency of 1.535 MHz. counter 1 and counter 2 are free for the user. clock for the clk₁, clk₂ is to be given externally.

4) 8155 (I/O, RAM & Timer)

The 8155 is on all in one chip which provides 22 I/O lines in the form of 3 ports. The chip also has on chip 14 bit timer/counter and 256 bytes of on chip RAM. The 3 ports (A, B, C) can be configured as I/P and O/P. The details can be referred from the data sheet.

D) Display

FT-8085 provides 6 digits of seven segment display. 4 digits are for displaying the address of any location name of any register, whereas rest of the 2 digits are meant for displaying the content of memory location or of a register. All the 6 digits of the display are on a hexadecimal notation.