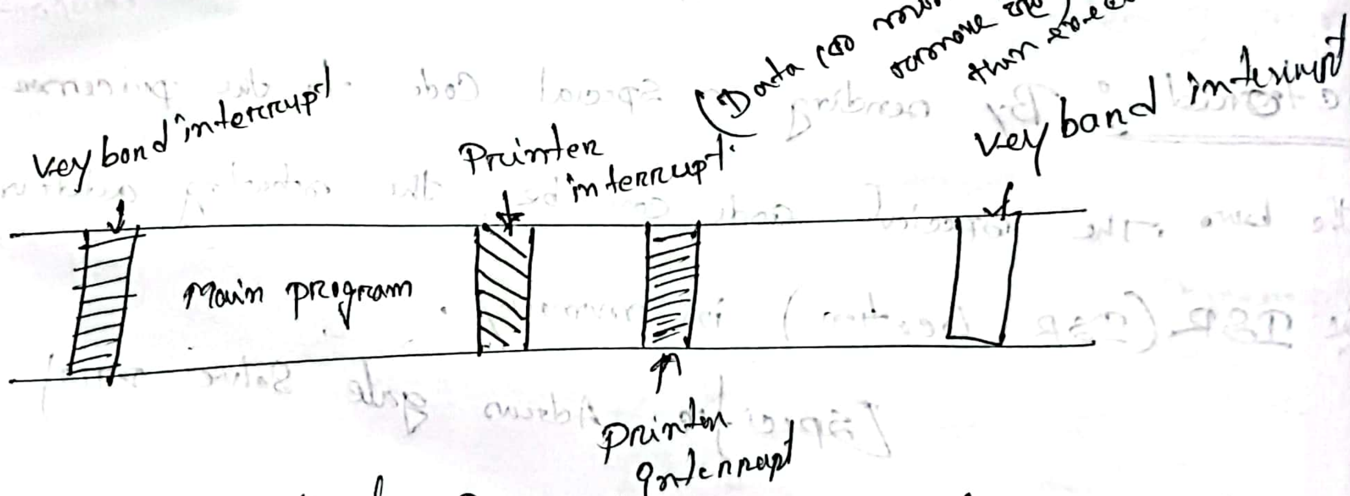
~~Interrupt Vector~~ table

Purpose of Interrupts : when useful

- Interrupts are useful when interfacing I/O devices at relatively low data transfer, such as keyboard inputs.

- Interrupts processing allows the processor to execute other software while the keyboard operator is thinking about what to type next.

  [interrupts allow করে অন্য software কে keybord chinta করার time অন্য কিছু execute করতে]



- time line that indicates interrupt usage in typical system

→ here time line shows typing on keybord, a printer removing data from memory and program executing.

8086 Interrupt vector table (IVT)

- Interrupt vector, and vector table are crucial to an understanding of hardware and software interrupts
- The IVT is located in the first 1024 bytes of memory address 000000H - 0003FFH :

Contains 256 different 4 byte interrupt vectors

* [0-255 interrupt আছে, তাদের 4 byte করে. 4×256 = 1024 bytes
[procedure আছে যে কাজে যাই গেলে কী কাজ করে]

- IVT তে 1st 2 bytes contain the offset address.
- " " Last 2 " " " segment "

কি কাজে হবে সেটাই

Table Described

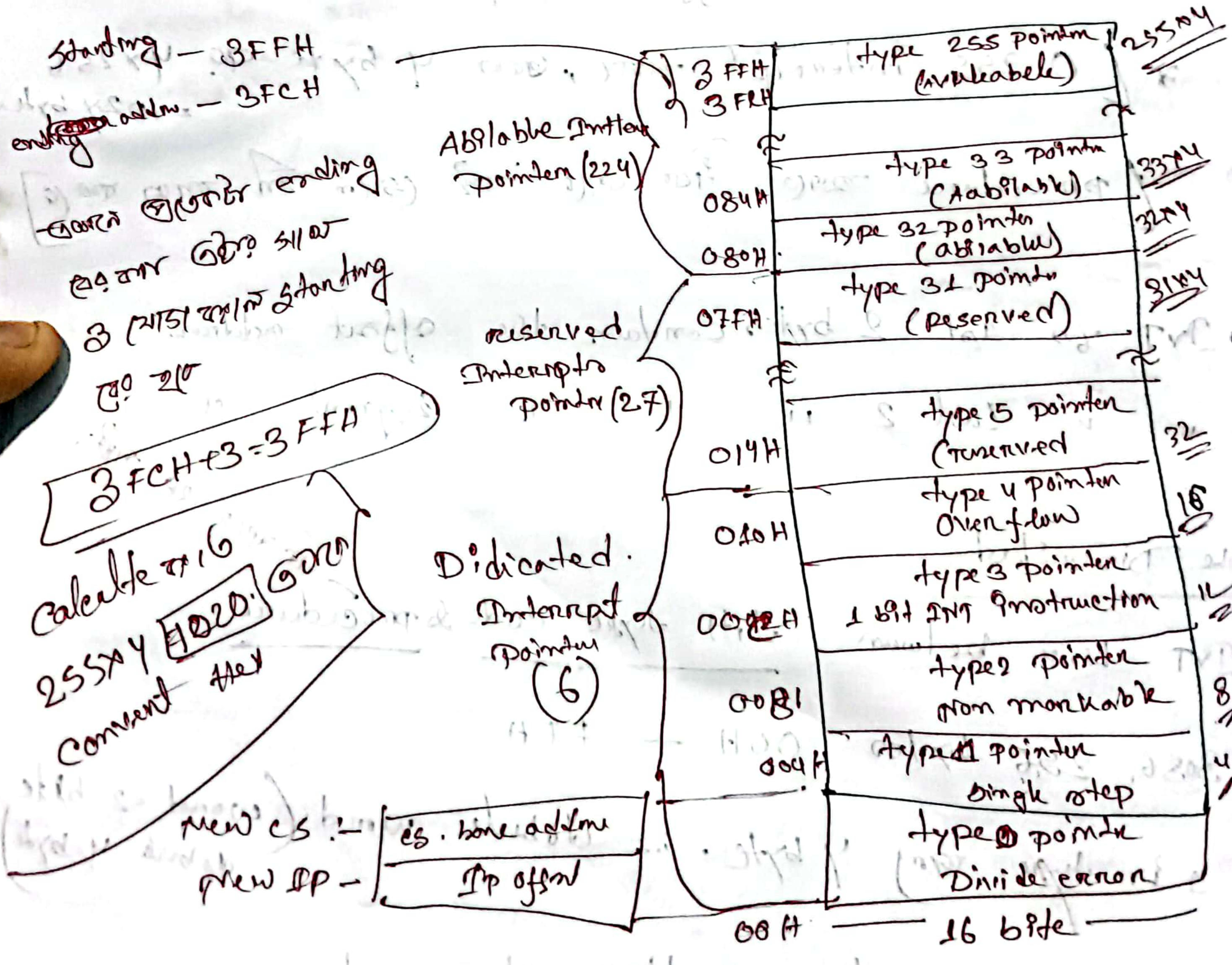
- IVT Link between Int type code & procedure
- 8086 256 bytes 00H — FFH
- 1 Int type জন্য 4 byte i.e double word (word = 2 byte, double 4 byte)
- এই double word এ address of procedure থাকে

Interrupts service এইখানে কাজ করে

- Higher addressed word pointer থাকে base address of segment, New IP থাকে

- Then New CS: New IP provides physical address when ISR start

- each type (2 New CS, 2 New IP) 4 bytes. So 256×4 = 1024 byte.



• IVT 3 groups

* Dedicated (INT 0-4) * reserved (INT 5-31)
* Available (INT 32-225)

Int(0) : (Devide error)

• ata হয় Jhokon Division অপারেশন হয়, Divisor ছোট হয় অথবা Dividend 0 হয় তখন Devide error হয়।

• This ISR address stored location 0×4 = 00000H in the IVT

INT 1 (single step) : This ISR ~~contents~~ generally display contents of all register location 1×4 = 00004H in the IVT.

in eng : This interrupt occurs whenever in Division error i.e when the result of a Division is too large to be stored. This condition (normally) occurs when Division is small as compared to the dividend or Division is zero.

Int 2 (non maskable Interrupt).

response on NMI Line

ISR address $2 \times 4 = 0008H$.

Int 3 : used to cause breakpoints in the program.
. It is useful in debugging large programs.
. It is used to display of all reg on screen
vector $3 \times 4 = 000CH$.

Int 4 (overflow)
. It occours if the overflow flag is set, MP executes the INTO (Interrupt on overflow)
. used to detect overflow error in ALU.
. ISR stored $4 \times 4 = 0010H$ in IVT

. Reserved INT (5 - 31)
. It reserved by Intel. to be used high processor 80386, Pentium. not available for user.

(c) Available interrupts (INT 32-225)

- It is user defined, Software Interrupts.
- Service various used defined conditions.

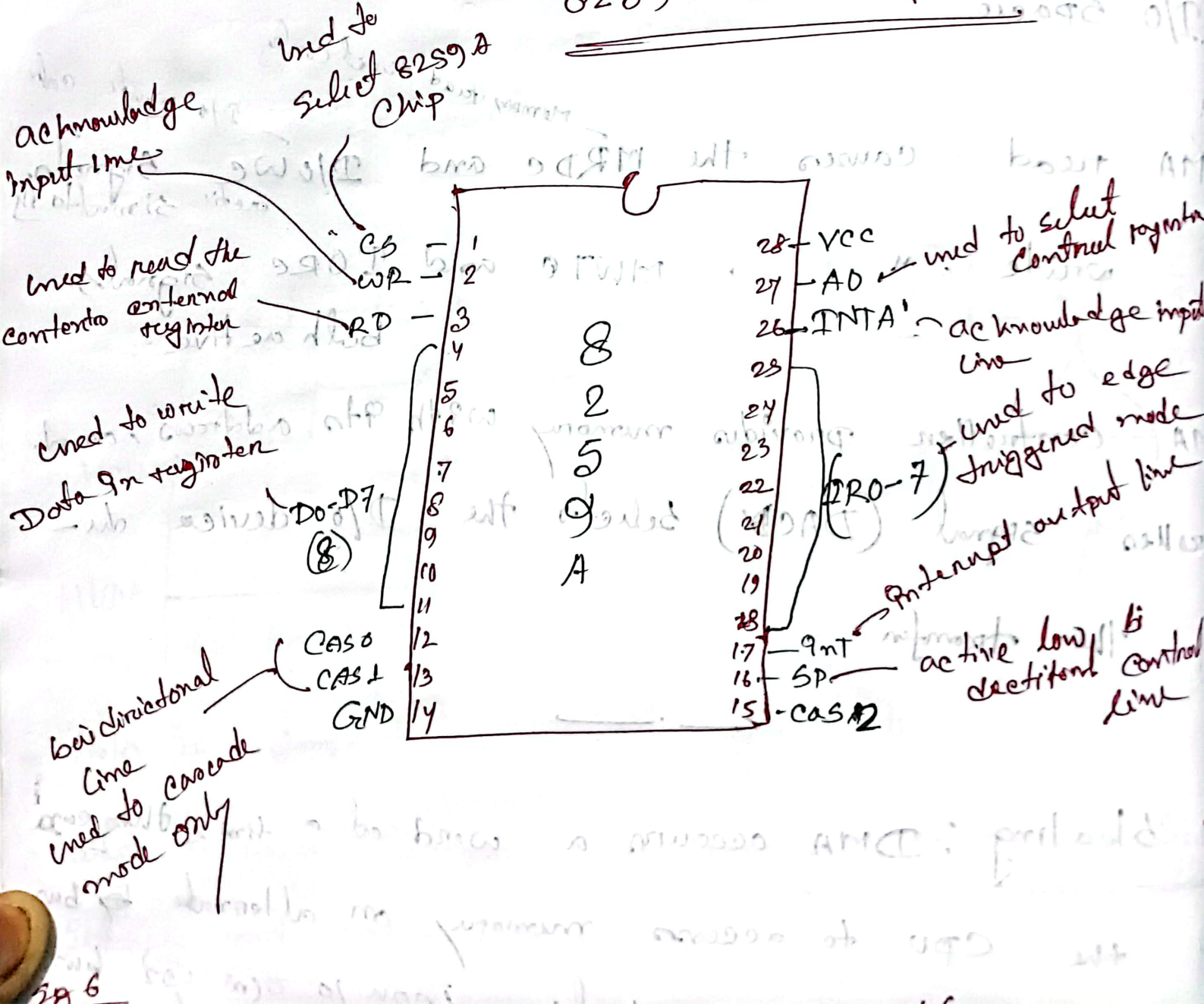
BOUND: It has 2 operands, and compares a register with two words of memory data.

IRET: The IRET instruction is a special return instruction used to return for both Software and hardware Interrupts.

- real mode & protected mode

real mode	protected mode
• old version of INT handling	• new extended version of real mode
• uses of 1MB of RAM	• uses 16 mb of RAM.
• uses Int vector table (IVT)	• uses INT description table (IDT)
• Multitasking not possible	• Multitasking possible
operation: when mp complete the executing the current instruction it determines whether an INT is active	**operation**: here INT has the same assignment as real mode, but the INT vector table is different

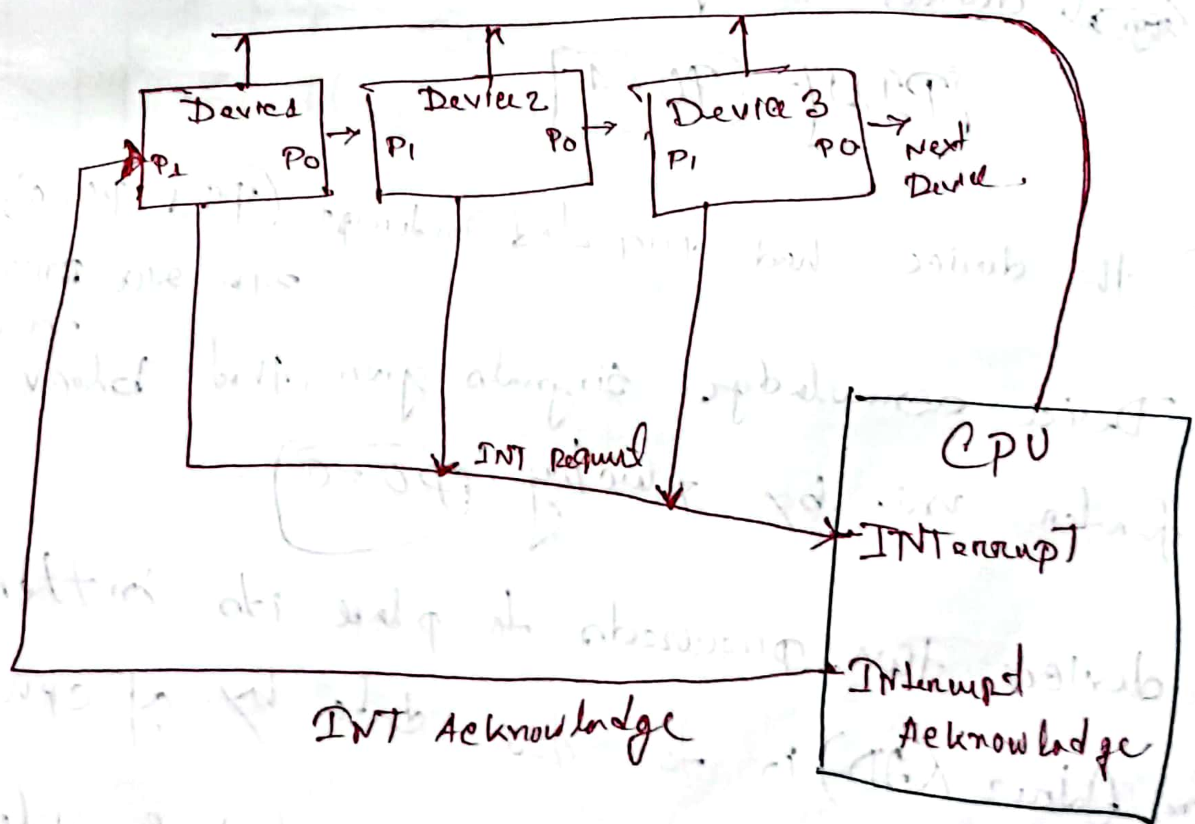
8259A Pin Diagram



DAISY Chaining

- Priority interrupt কে execute করার উপায়।
- Connecting all device that can req. INT in serial manner
- This configuration governed by the priority of devices.

[যেটার Highest আগে]



VAD এটার vector Address

INT, req.

Working

- when no int are pending its ^ High state, device return its to become low state.
- Cpu acknowledge Int req from line and enables the int acknowledge
- The signal received at the PI (priority input) of device
- If device not requested, pass it this to Next devices through its PO (priority output)

PI=1 PO=1

- If the device had requested interrupt (PI=1 : PO=0)
  আৰ আৰু বন্ধ
  হয়।
- The Device acknowledge signals given, that block its further one by placing PO=0
- The device then proceeds to place its interrupt vector Adrun (VAD) in to the data bus of cpu
- The Device puts its Int. req. singnal high state to indicate interrupt has been off.
- If PI =0 and PO =0 then any acknowledge Singal has blocked.