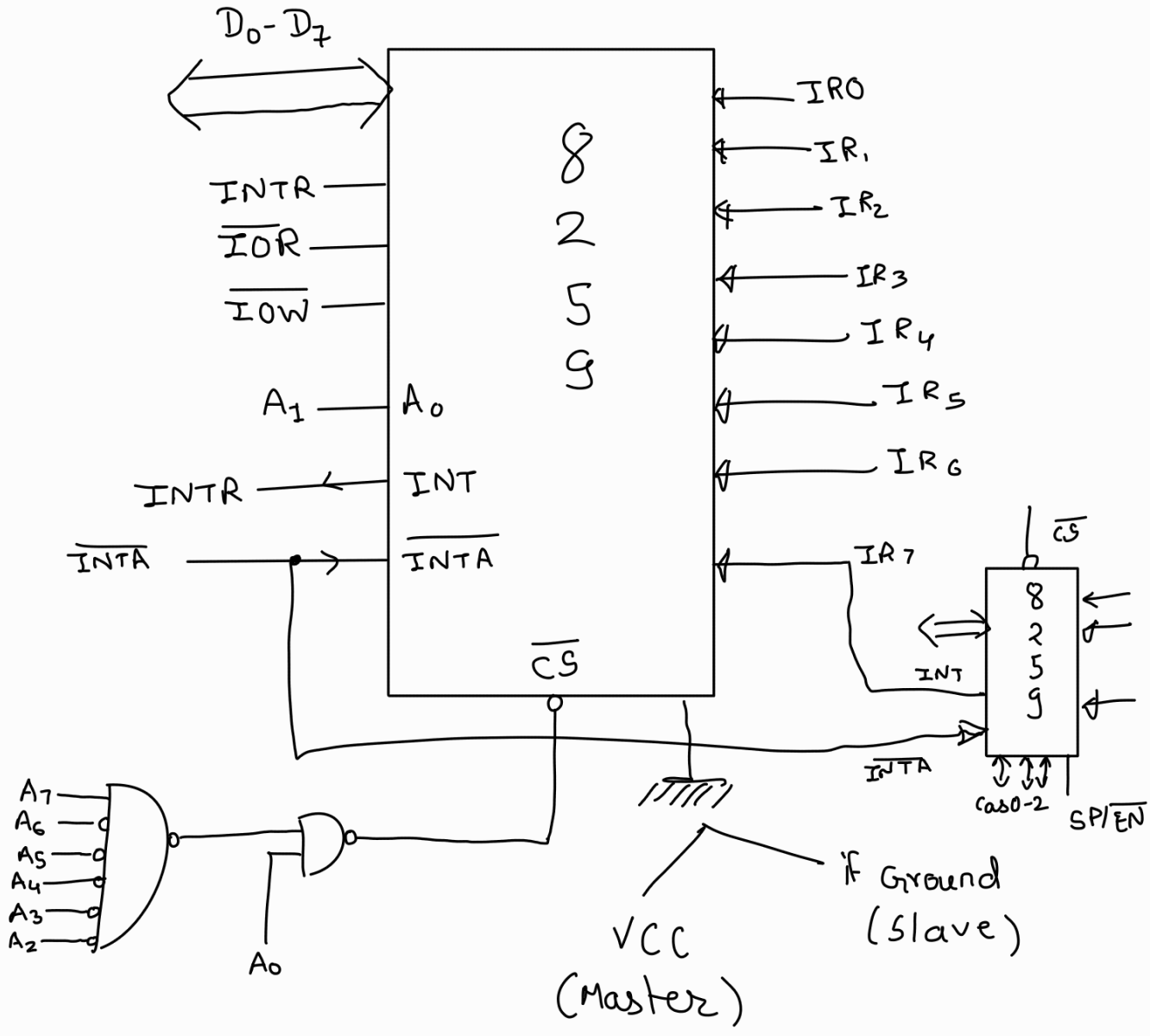
8259



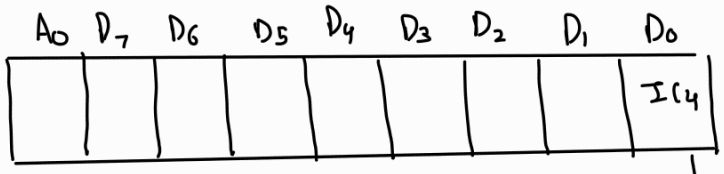
Multiple type of CW

- Initialization Command Words [ICWs]
  - 4 subtypes
- Operational Command Words [OCW]

ICWs:

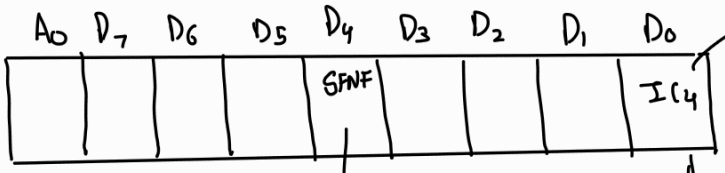
ICW 1 and 2 is necessary. All are necessary but

ICW 1 → programmed by A_0 line = 0



→ 0 – Not needed
→ 1 – ICW4 is needed and thus programmed

ICW4



always 1 in each case

→ 1 (for 8086/88)
→ 0 MCS-80/85 Mode

→ Cascading → connecting another 8259 to the master's IR7 line

1 → Specially Fully Nesting Mode

0

SNGL –

ADI → Not related to 8086

D_3 LTIM → 1 → All IR levels are edge triggered
0 → All IR levels are rising edge triggered

D5-D7 → Related to 8085

ICW2

$T_3 - T_7$ → relevant bits for 8086.

C0

1100 0

1100 0000

1 1100 0000

E 0

```
MOV  AL, 1F   ← ICW 1
OUT  80, AL
                ← ICW 2
MOV  AL, C0
OUT  82, AL
MOV  AL, 01   ← ICW 4
OUT  82, AL
```

Here we need the ICW's to have A0, hence we are making A1 to 1 as A1 of 86 is connected to 8259's A0.

Suppose D_1 in ICW1 is 0,
8259 is in cascaded mode.

If all slaves are connect to all slaves then all bits will be 1.

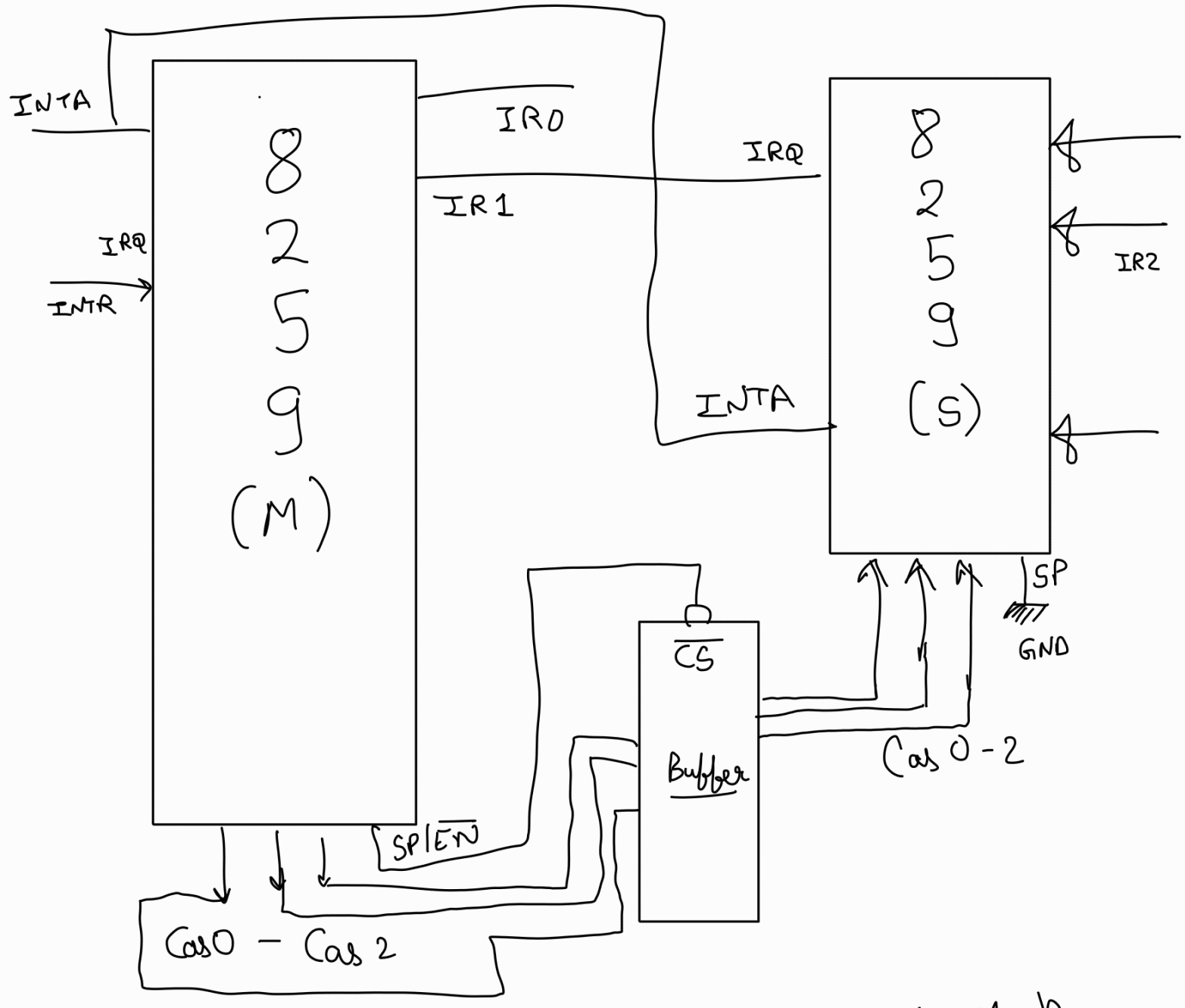
when this is the case

Slave Device 8259:

↳ $D_2 - D_0$ represents pin on which slave 8259 is connected.

if IR 0 — slave

	D_2	D_1	D_0
	0	0	0
IR6	1	1	0



IMR - Interrupt Mask Register.

fully nested Mode:

Cas lines are i/p lines for slaves, o/p lines for master

M/S Slave = 0 Master = 1

End of interrupt:

Fully Nested Mode assumes

AEOI – Automatic end of interrupt.

OCW1 → Masking Interrupts.

↳ issued by A0 = 1

↳ Programs the interrupt mask

8259 → IMP (END of Interrupt)

OCW2

↳ Specifically meant for END of Interrupt.

[001]- Non Specific Mode:

Resets bit of the highest precedence bit.

before IRET is issued we need to Issue the OCW2 command to protect fully nested mode.

[011] - Specific Mode :

011 - Lowest three bits decide which priority bit to reset.

[101] - Rotate on Non-Specific EOI command.

Next interrup which comes will be assigned the least priority.

[100] - Rotate on AEOI.

· Assumes

[111] Rotate on Specific EOI.

OCW3

```
MOV  AL, 13
OUT  AL, 80
IN   AL, 80
```

Read IMR port, for OCW1.

```
IN , AL, 82
```

WAP to read IRR :

OCW3

```
MOV  AL, 0A
OUT  80, AL
IN   AL, 80
```

0 0 0 0 1 0 1 0

0 A

If Polled Mode used, there's no need to connect IRQ pin to INTR pin.