

Interfacing 8255 PPI with 8085
using I/O and memory mapped

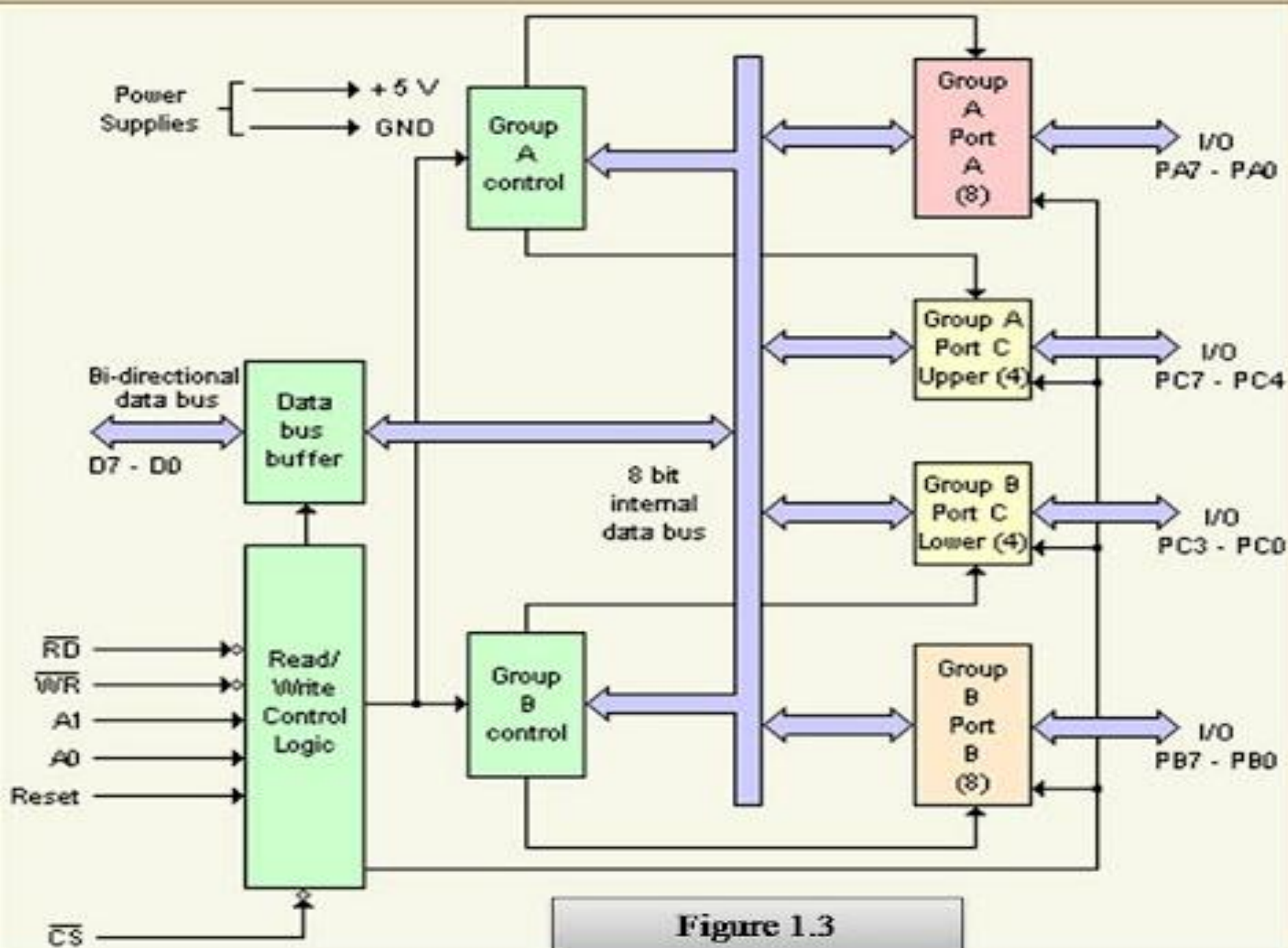
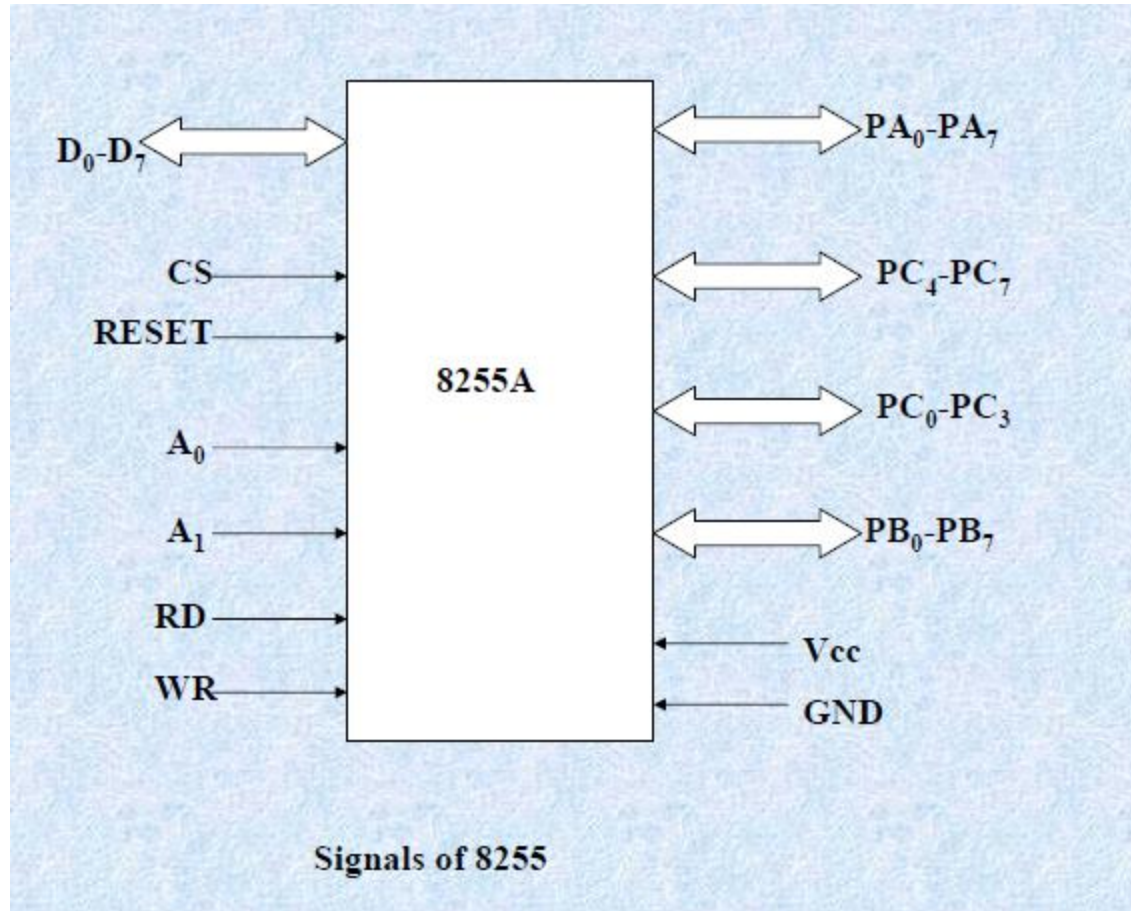


Figure 1.3

Signals of 8255



Step 1:

Lower order of 8-bit address A0-A7 is separated from AD0-AD7 using address latch/buffer (Ex: IC 74373) and ALE signal.

The separated address lines A0-A7 are connected to A0-A7 input pins of 8255 and the separated data bus D0-D7 are connected to D0-D7 pins of 8255.

Reset out of 8085 is connected to reset pin of 8255.

Step 2:

8255 does not have internal (separate) control logic generator, hence the IO/M(bar), RD(bar) and WR(bar) control signals are not connected directly to 8255. These pins are 1st given to decoder and decoded using 3:8 decoder (Ex: IC 74138).

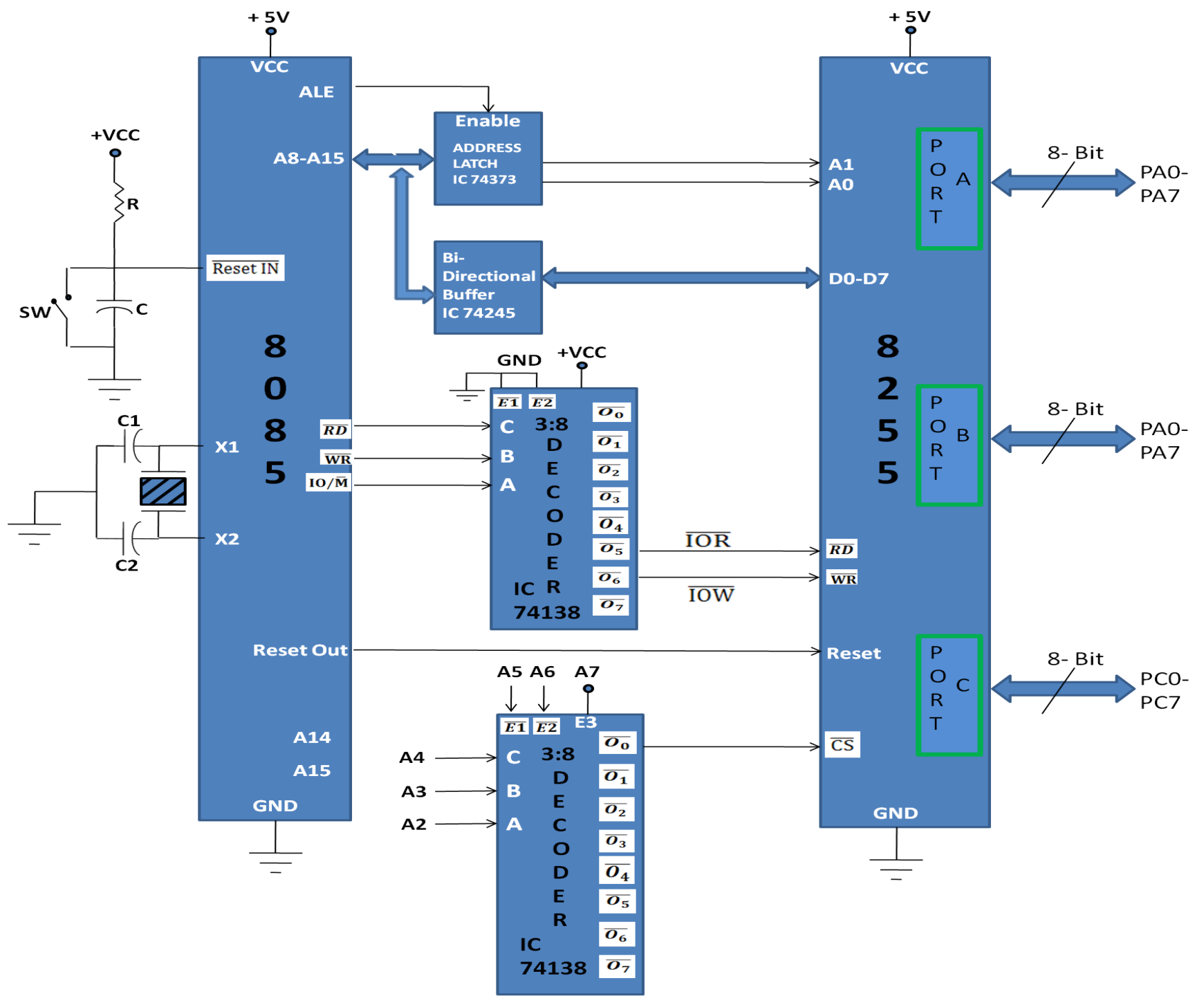
The generated control signals IOR(bar) and IOW(bar) are connected to RD(bar) and WR(bar) input of 8155.

Step 3:

An active low signal of chip select logic is obtained decoding remaining address lines of lower order addresses A2- A7.

Chip select logic and IO port address for this interfacing circuit are as:

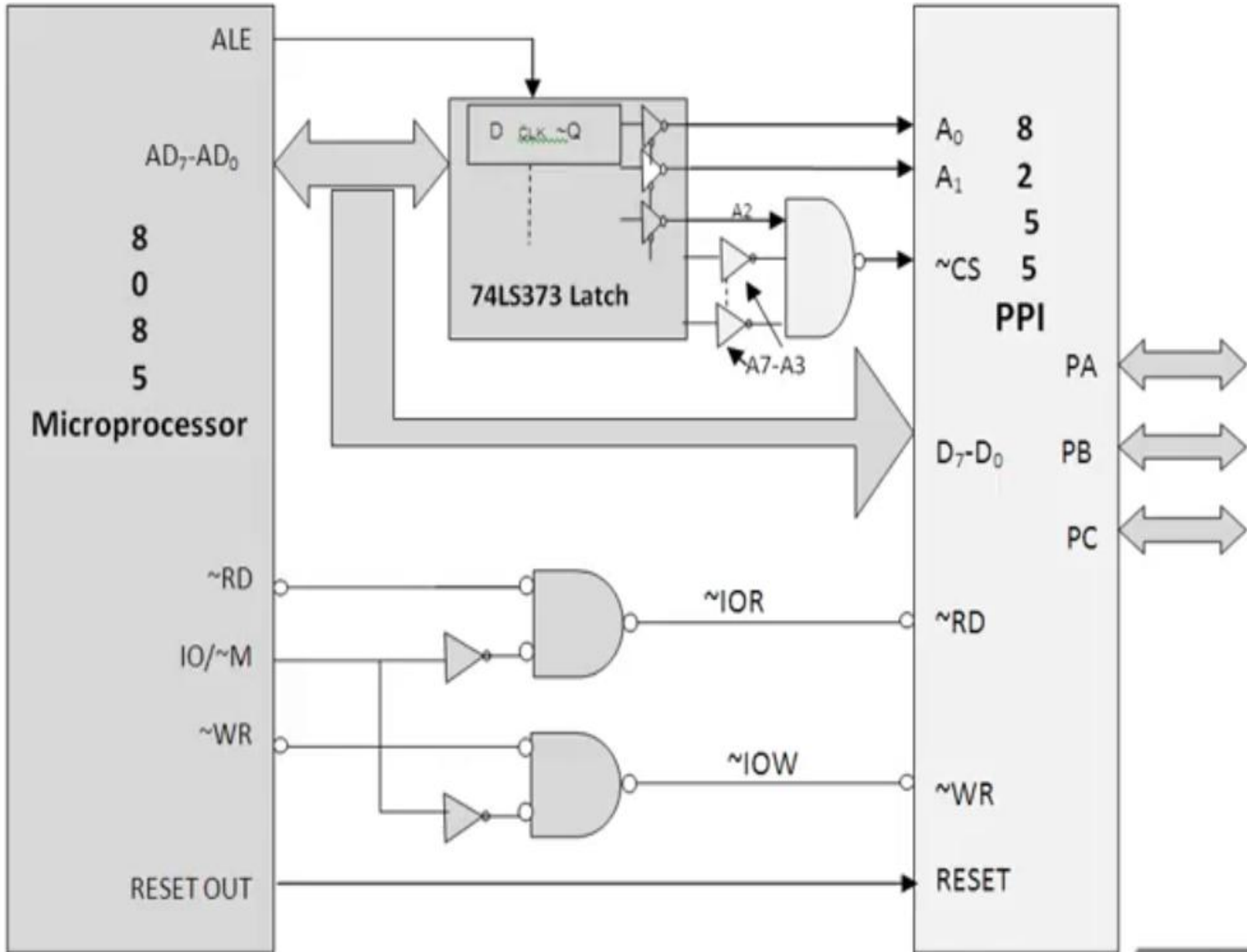
Chip select address lines	Address lines to select port	HEX address	Selected I/O						
A7	A6	A5	A4	A3	A2	A1	A0		
1	0	0	0	0	0	0	0	80H	PORT A
1	0	0	0	0	0	0	1	81H	PORT B
1	0	0	0	0	0	1	0	82H	PORT C
1	0	0	0	0	0	1	1	83H	Chip select register



Interfacing of the 8085 microprocessor with the 8255 PPI

- 1. Determine the ports (port A, port B and port C) and control word register CWR addresses either by using peripheral mapped technique or memory mapped technique.
 - a. **Peripheral or I/O mapped addressing technique:**

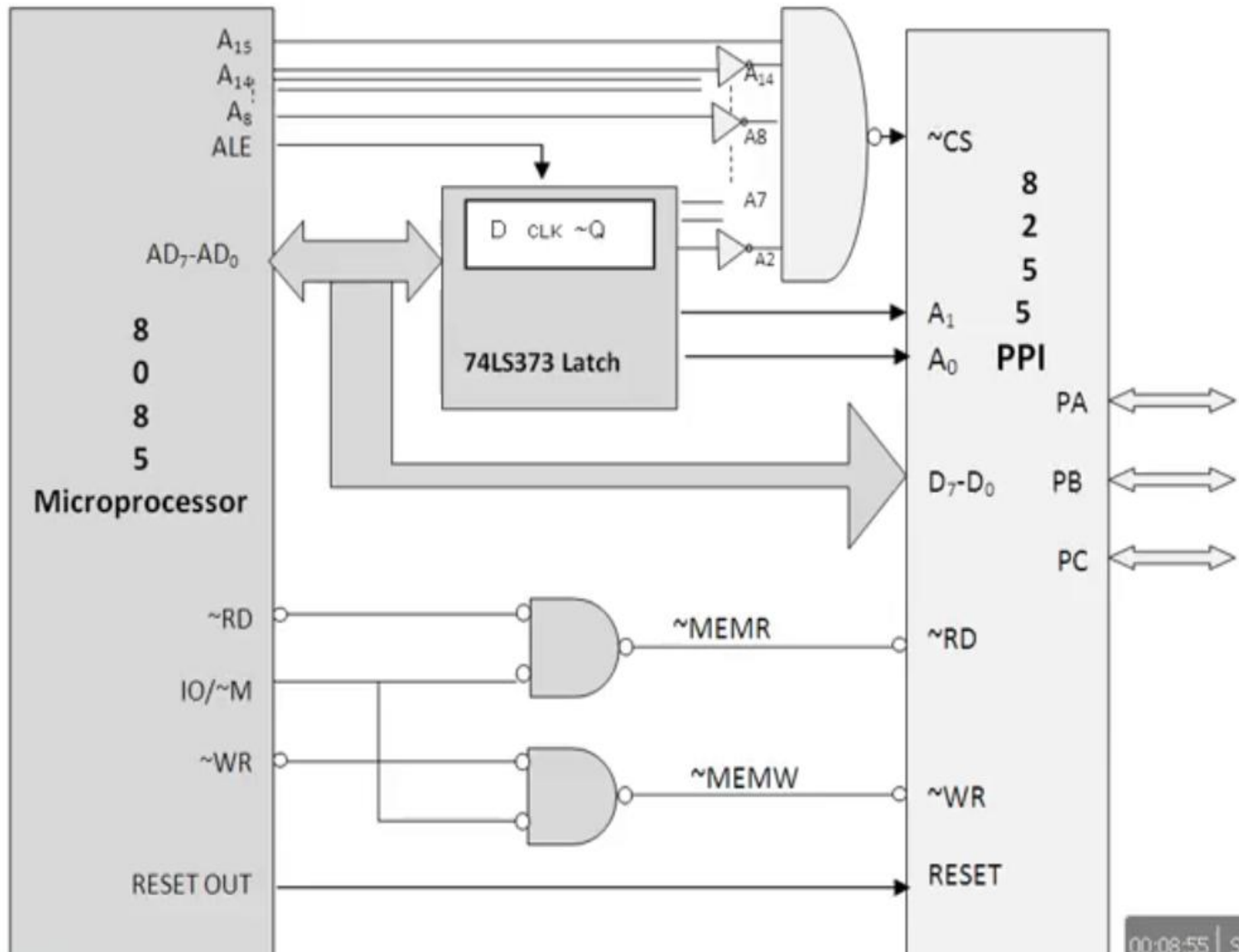
~CS (chip select)							Port/register selects		HEX address	Port/register
A ₇	A ₆	A ₅	A ₄	A ₃	A ₂		A ₁	A ₀		
0	0	0	0	0	1		0	0	04H	Port A
0	0	0	0	0	1		0	1	05H	Port B
0	0	0	0	0	1		1	0	06H	Port C
0	0	0	0	0	1		1	1	07H	CWR



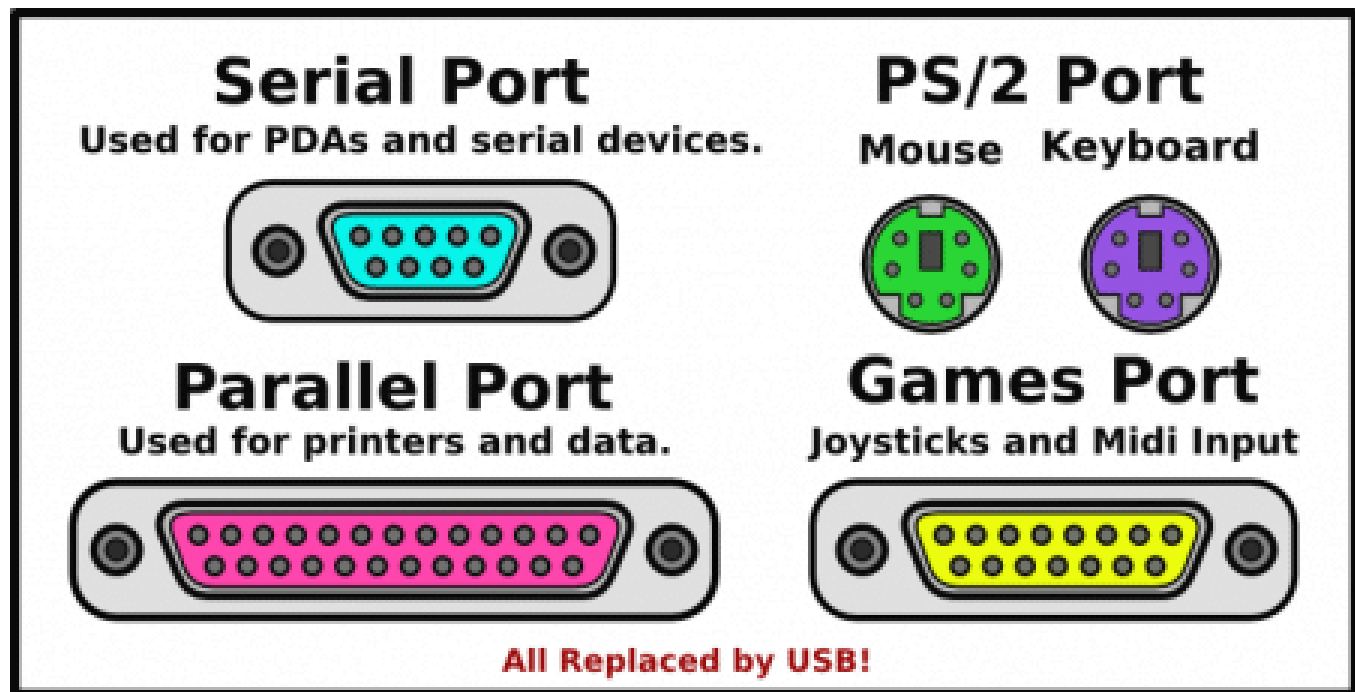
Interfacing 8255 with 8085 using memory mapped **STA LDA**

b. Memory mapped I/O addressing technique:

~CS (chip select)														Port/register selects		HEX address	Port/register
A ₁₅	A ₁₄	A ₁₃	A ₁₂	A ₁₁	A ₁₀	A ₉	A ₈	A ₇	A ₆	A ₅	A ₄	A ₃	A ₂	A ₁	A ₀		
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8000H	Port A
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	8001H	Port B
1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	8002H	Port C
1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	8003H	CWR



A **parallel interface** refers to a multiline channel, with each line capable of transmitting several bits of data simultaneously. ... In contrast, a "**serial interface**" uses a **serial port**, a single line capable of only transmitting one bit of data at a time; a computer mouse connection is a good example.



A **parallel port** is a type of [interface](#) found on [computers](#) ([personal](#) and otherwise) for connecting peripherals. The name refers to the way the data is sent; parallel ports send multiple [bits](#) of data at once,

There are many types of parallel ports, but the term has become most closely associated with the **printer port** or [Centronics port](#)

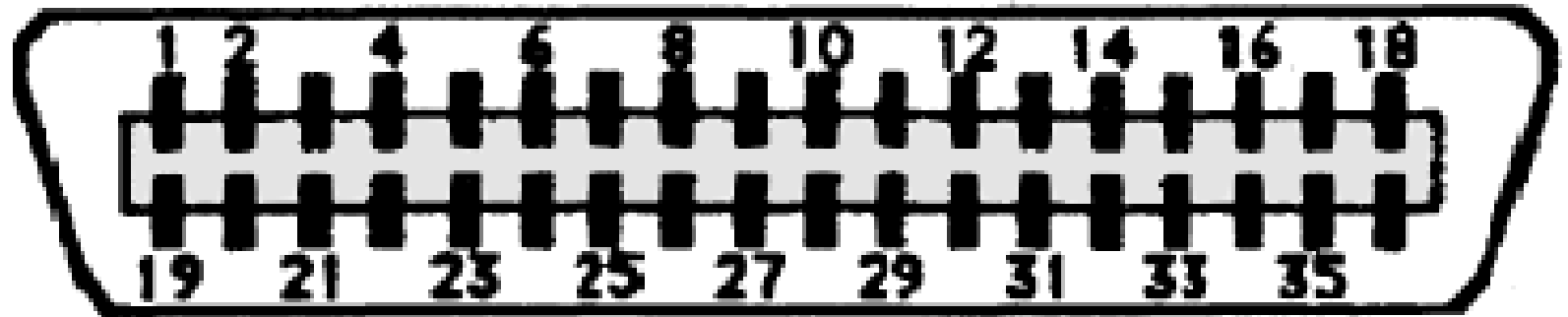
Today, the parallel port interface is virtually non-existent because of the rise of [Universal Serial Bus](#) (USB) devices, along with network printing using [Ethernet](#) and [Wi-Fi](#) connected printers.

Printer port

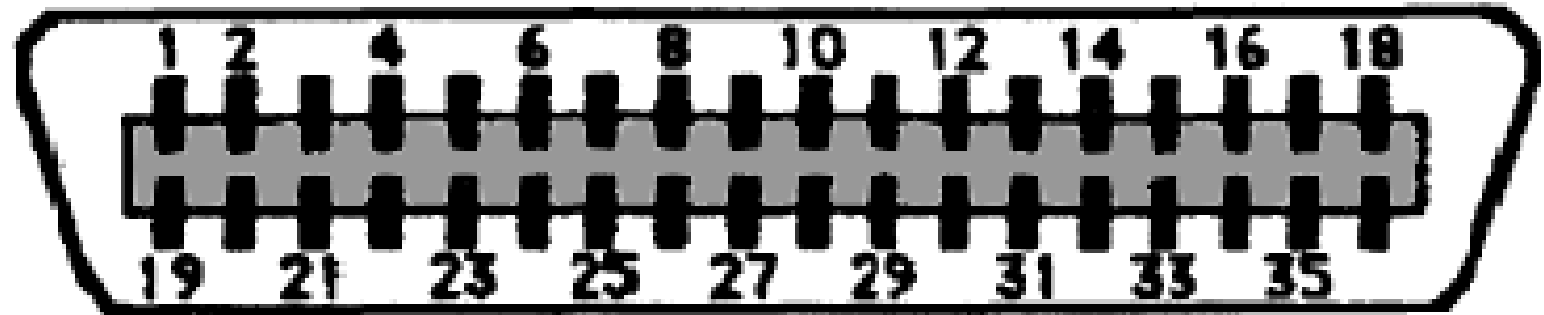


Parallel port on computer

- The Centronics [parallel interface](#) is an older and still widely-used standard [I/O](#) interface for connecting [printer](#) s and certain other devices to computers.
- a 36- [pin](#) male and female connector at the printer or other device.
- The cable plugs into a 25-pin parallel [port](#) on the computer.
- Data flows in one direction only, from the computer to the printer or other device
- In addition to eight parallel data lines, other lines are used to read status information and send control signals.
- Centronics Corporation designed the original Centronics parallel interface for dot matrix printers. In 1981, IBM used this interface as an alternative to the slower one-bit-at-a-time [serial](#) interface



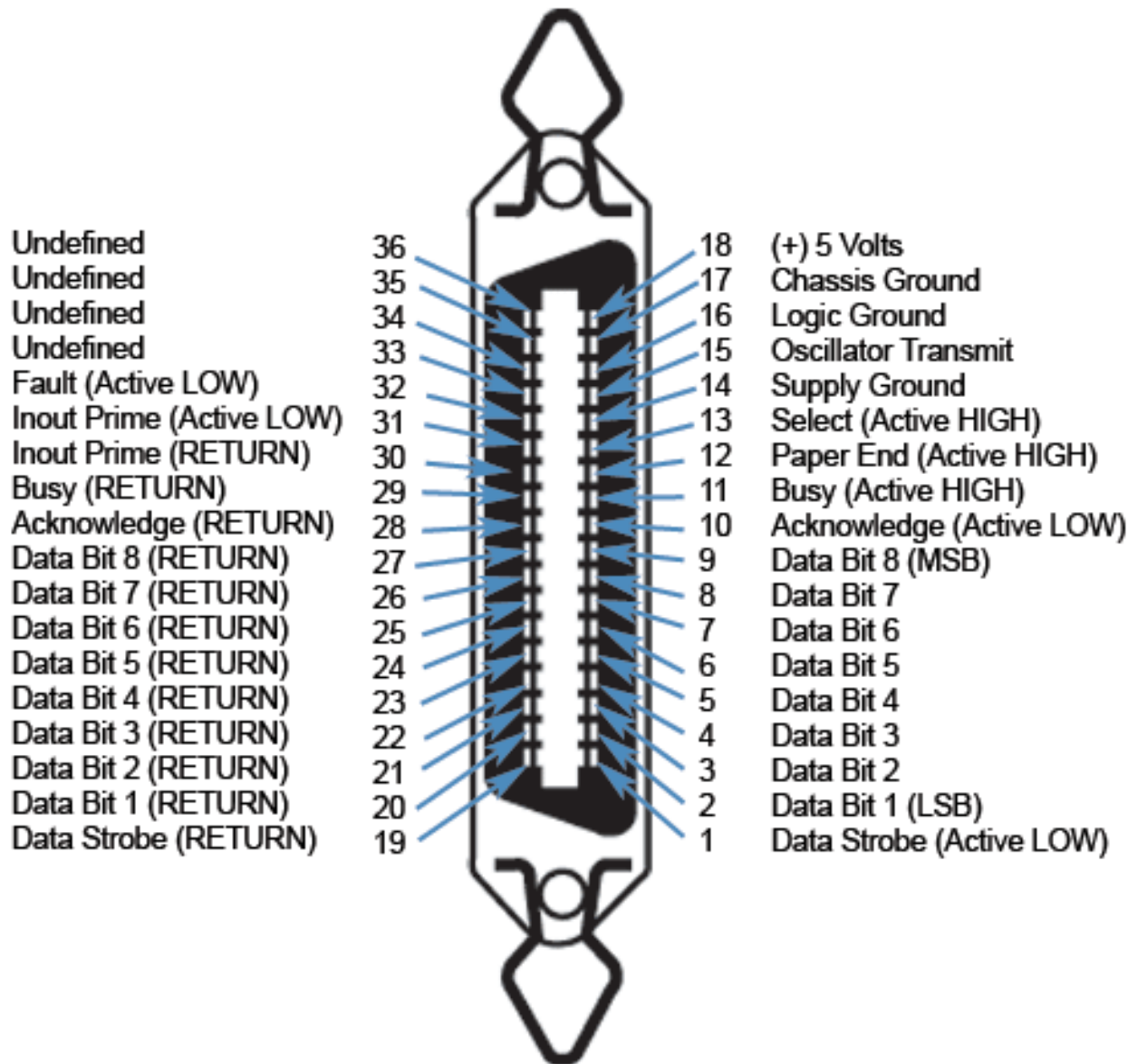
Male 36-pin Centronics Connector



Female 36-pin Centronics Connector

(Centronics parallel interface male and female)

Pin Description of Centronics parallel interface:-



Centronics parallel interface with computer and printer

PC		Printer
DB 25 socket		CP 36 socket
1	Strobe →	1
2	D0 →	2
3	D1 →	3
4	D2 →	4
5	D3 →	5
6	D4 →	6
7	D5 →	7
8	D6 →	8
9	D7 →	9
10	Acknowledge ←	10
11	Busy ←	11
12	Paper Empty ←	12
13	Select ←	13
14	Auto Linefeed →	14
15	Error ←	32
16	Init →	31
17	Select In →	36
18-25	Signal GND —	19-30
	Shield —	17
	+5 V DC (opt.) —	18

