



Mikroračunarski sistemi

20ER6004



8255A

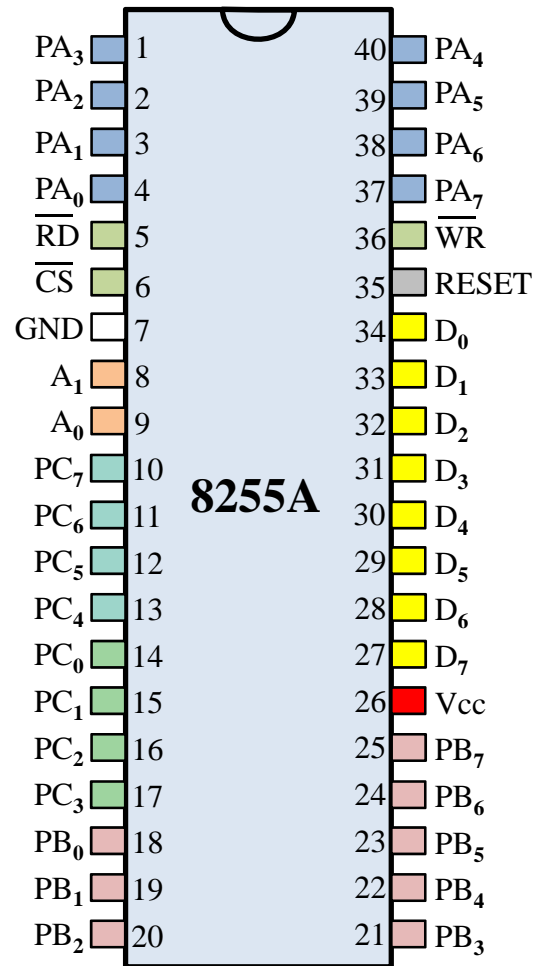


8255A

programabilni perifernjski interfejs

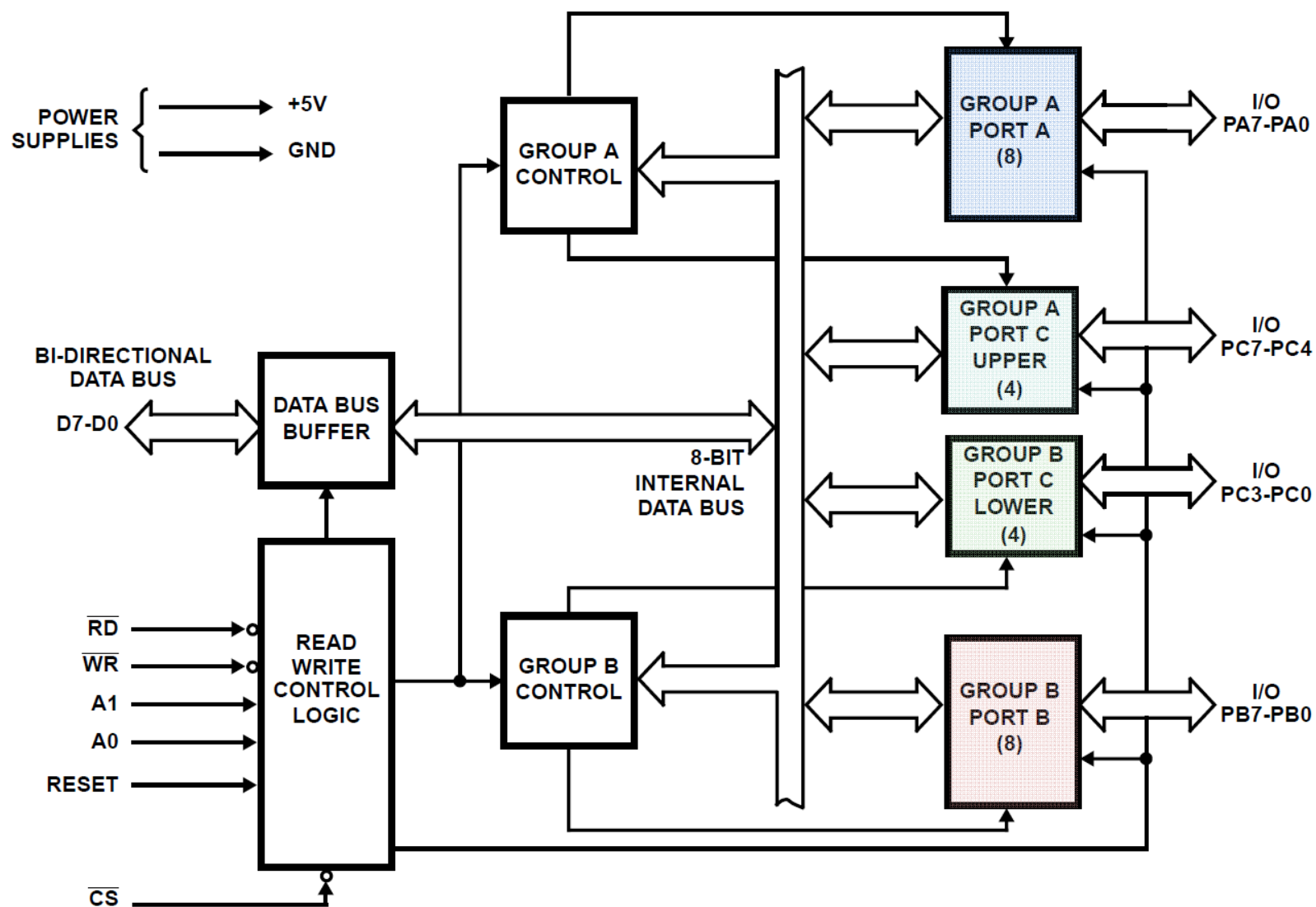
- 24 programabilna U/I pina
- Tri moda rada
- Direktni set/reset

8255A



- Vcc – napajanje (+5V)
- GND – uzemljenje
- D₀-D₇ – magistrala podataka
- RESET – briše kontrolni registar i vraća sve portove na „input“ mod
- CS – (*chip select*) omogućuje magistralu podataka i komunikaciju sa CPU
- RD – (*read*) čitanje statusa ili podataka sa portova
- WR – (*write*) učitavanje kontrolne reči i podataka u 8255A
- A₀-A₁ – (zajedno sa RD i WR) adresira jedan od 3 porta ili kontrolni registar
- PA₀-PA₇ – port A (8-bitni)
- PB₀-PB₇ – port B (8-bitni)
- PC₀-PC₇ – port C (8-bitni)

Logička šema



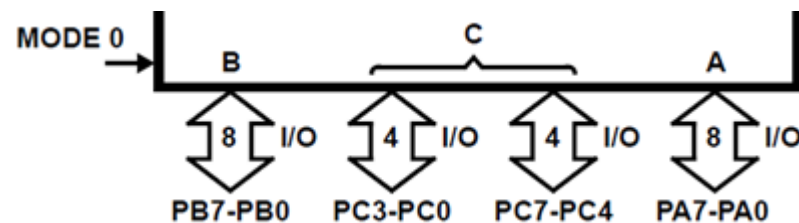


Osnovni modovi rada

- **Mod 0** – Osnovni ulaz/izlaz
- **Mod 1** – Strobovani ulaz/izlaz
- **Mod 2** – Bidirekciona magistrala

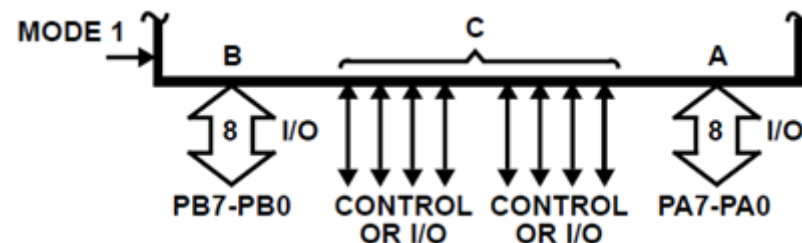
Mod 0

- Dva 8-bitna i dva 4-bitna porta
- Svaki port može biti ulazni ili izlazni
- Izlazi su „lečovani“
- Ulazi nisu lečovani
- 16 mogućih (različitih) konfiguracija



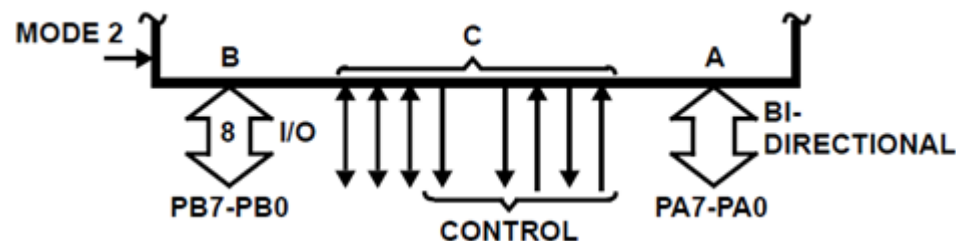
Mod 1

- Omogućuje U/I transfer uz „hand shake“ signale
- 2 grupe portova (A i B)
- Svaka grupa sadrži 8-bitni port i 4-bitni
- 8-bitni portovi podataka mogu biti ulazni ili izlazni, i u oba slučaja su podaci „lečovani“
- 4-bitni portovi se koriste za upravljanje i status 8-bitnih portova

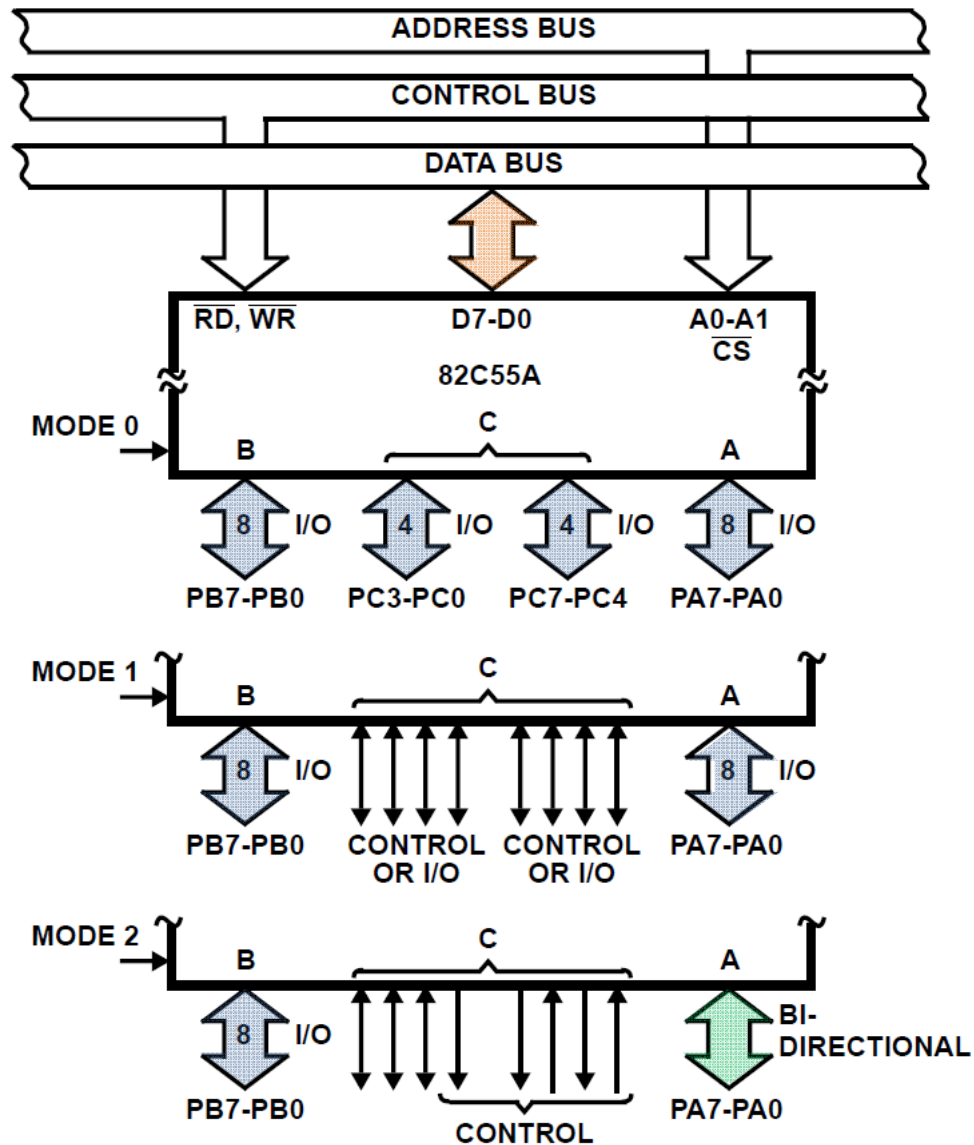


Mode 2

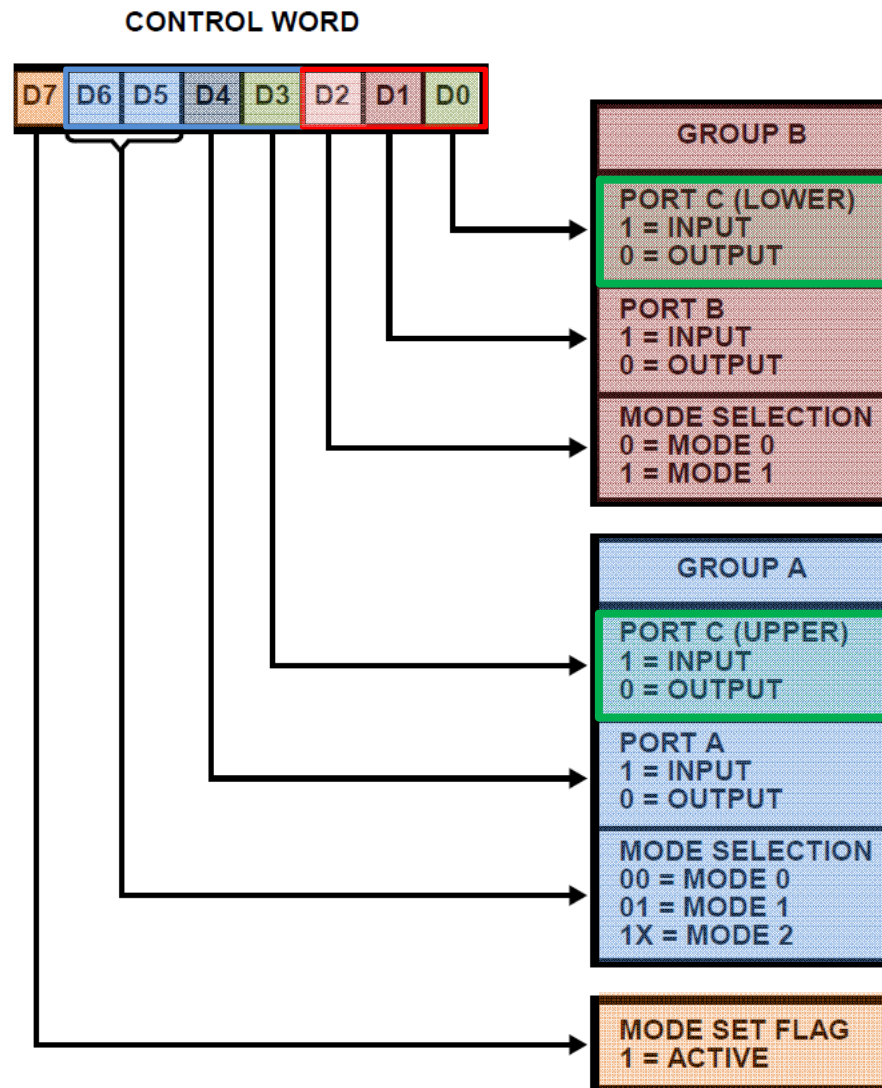
- Omogućuje komunikaciju sa periferijom preko jedne 8-bitne bidirekcionne magistrale
- „Hand shake“ signali upravljaju tokom
- Koristi se samo za grupu A
- Jedan 8-bitni bidirekcionni port (A) i 5-bitni upravljački port (C), koji upravlja i daje status bidirekcionne magistrale
- I ulazi i izlazi su lečovani



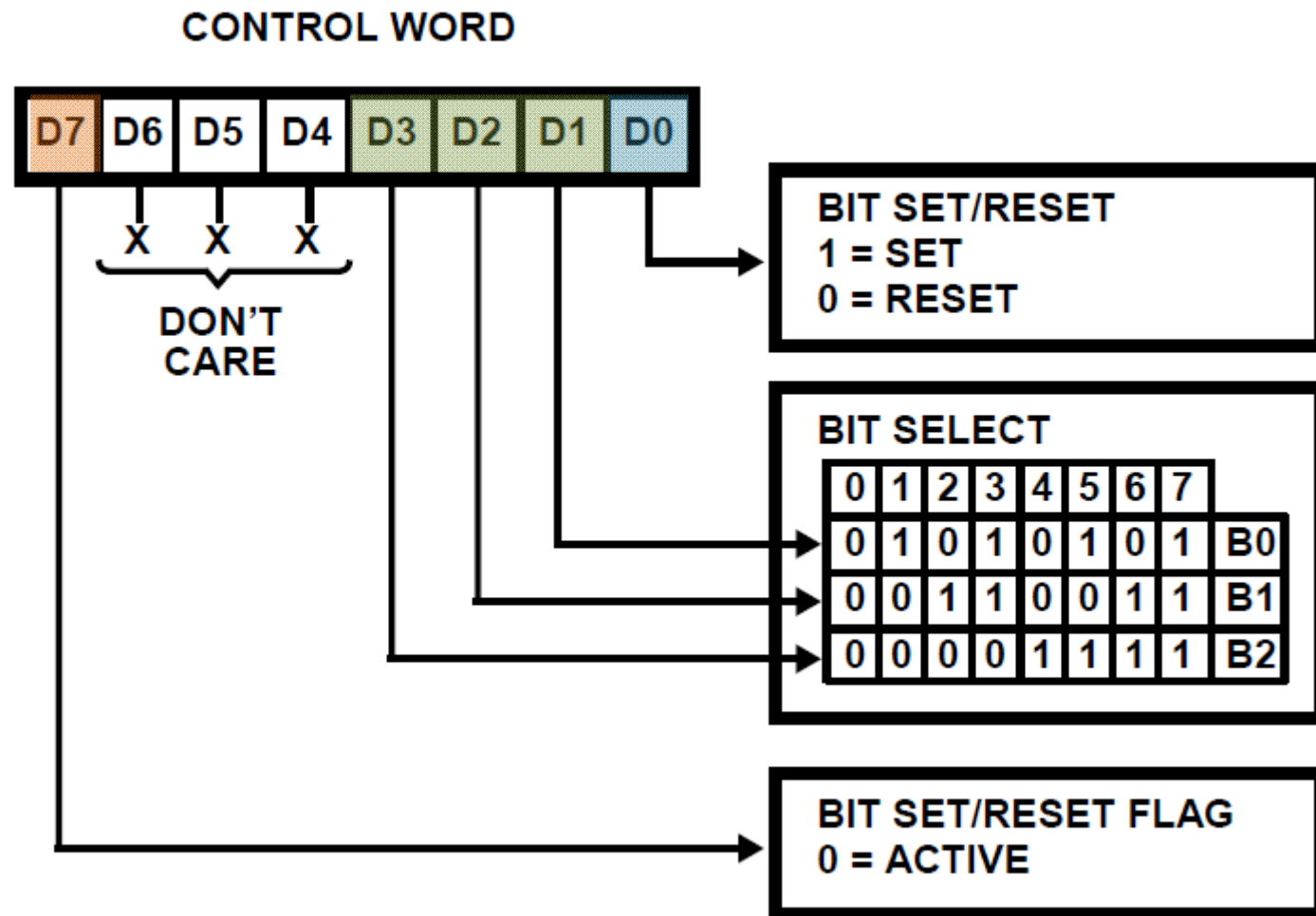
Osnovni modovi i interfejs



Definisanje moda rada



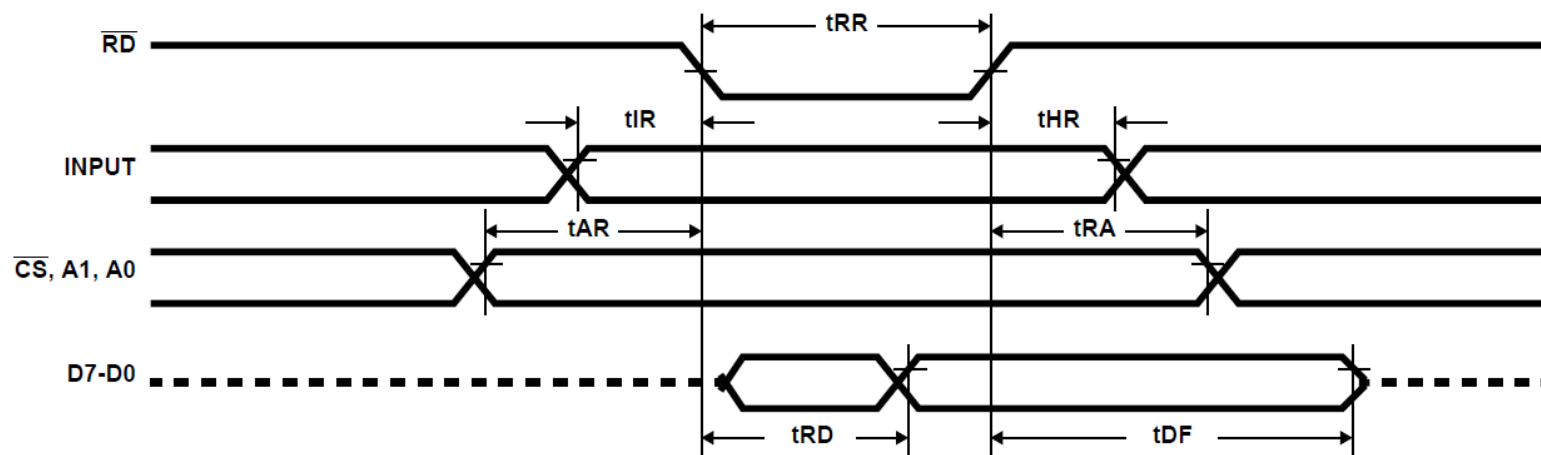
Bit Set/Reset format



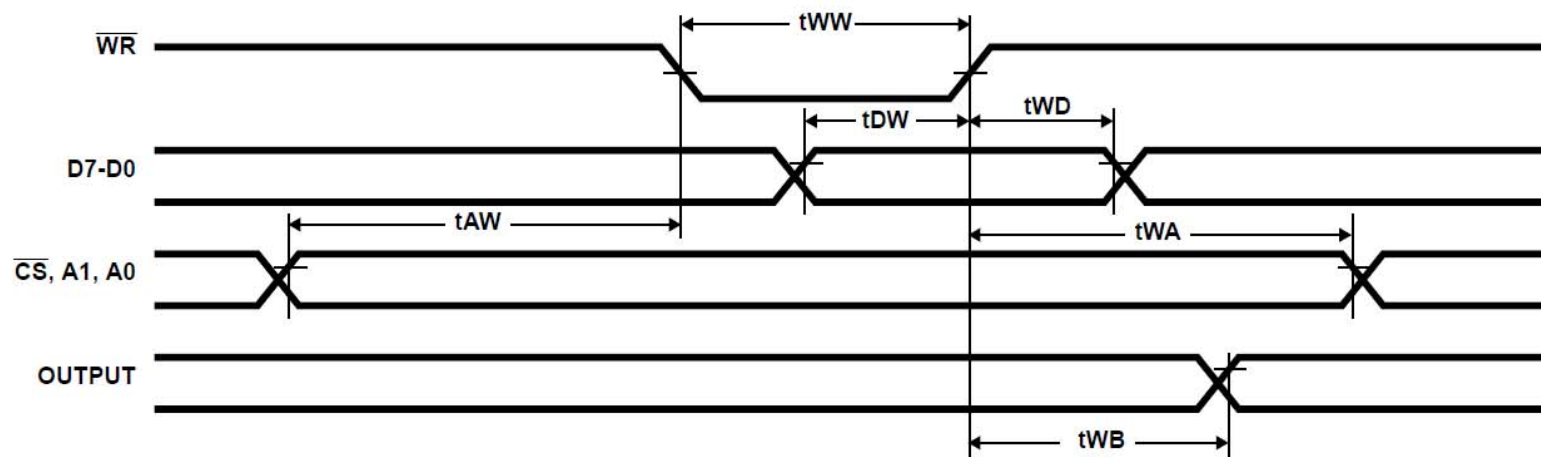
Mod 0

vremenski dijagrami

Mode 0 (Basic Input)

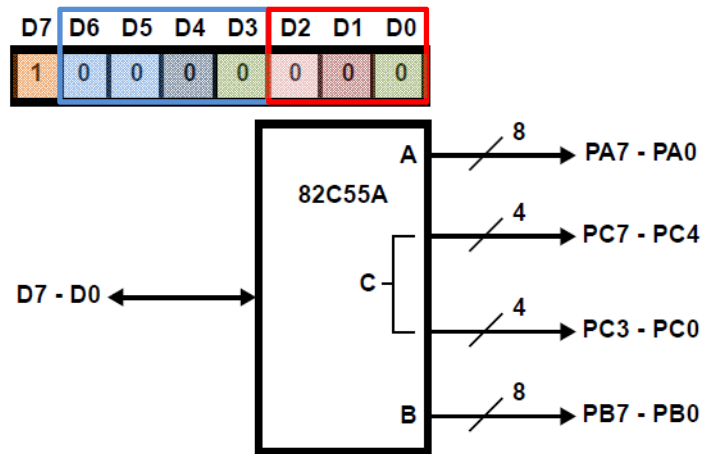


Mode 0 (Basic Output)

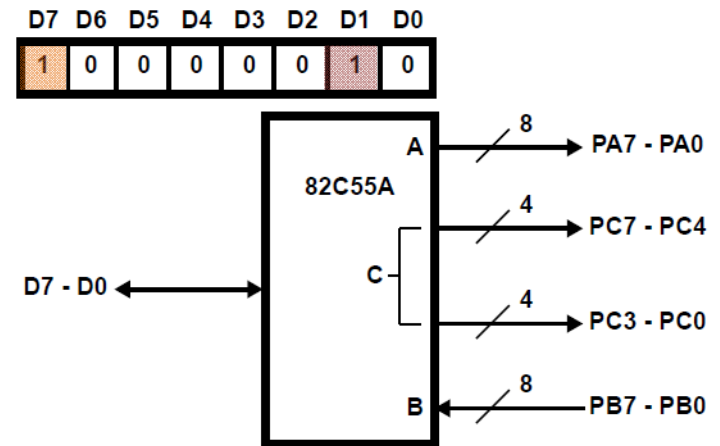


Mode 0 – Primer 1

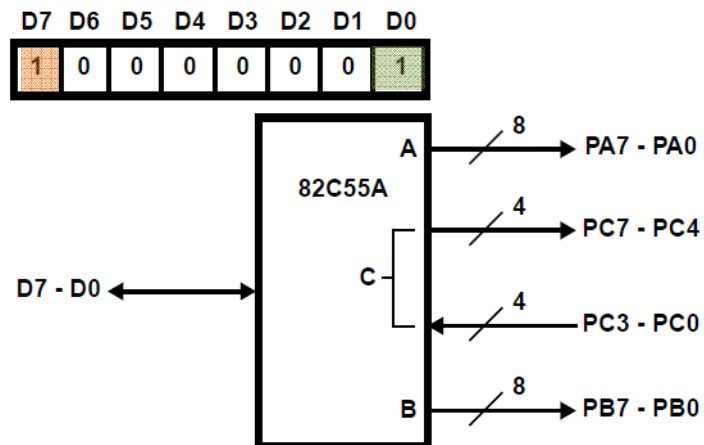
CONTROL WORD #0



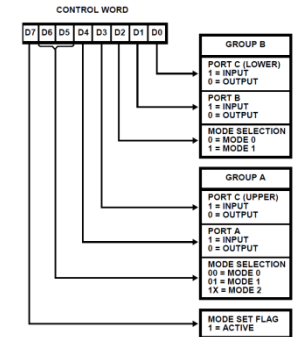
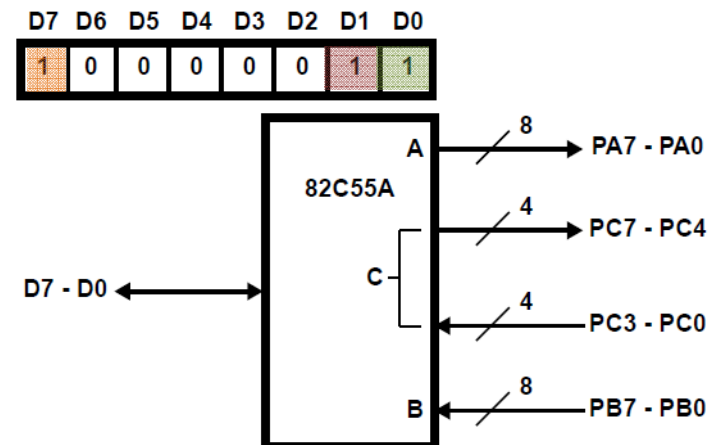
CONTROL WORD #2



CONTROL WORD #1

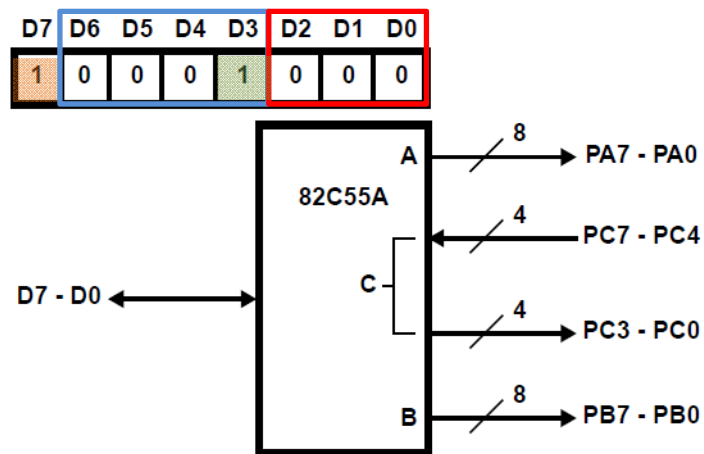


CONTROL WORD #3

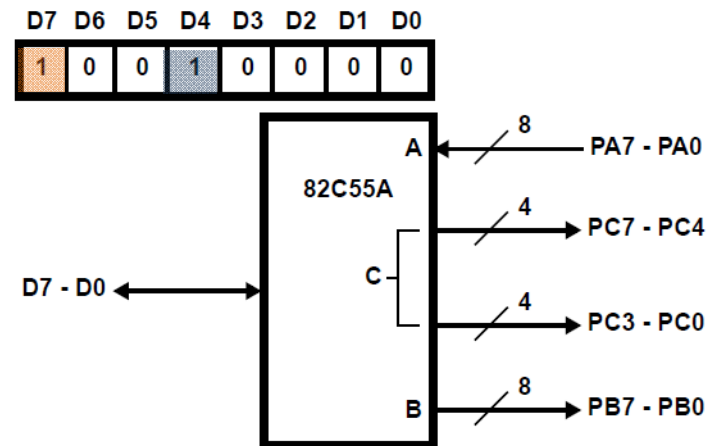


Mode 0 – Primer 2

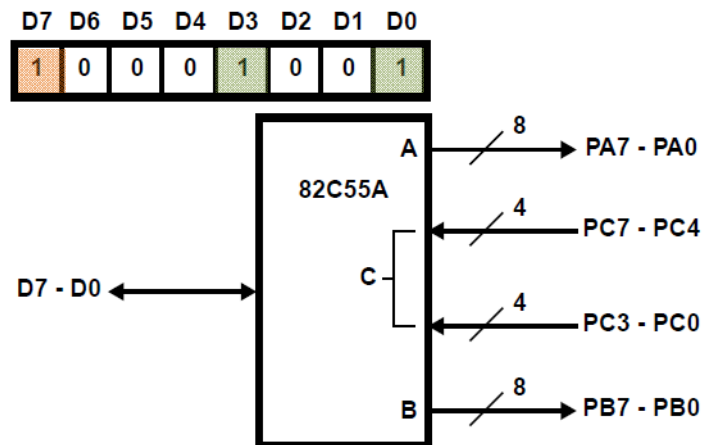
CONTROL WORD #4



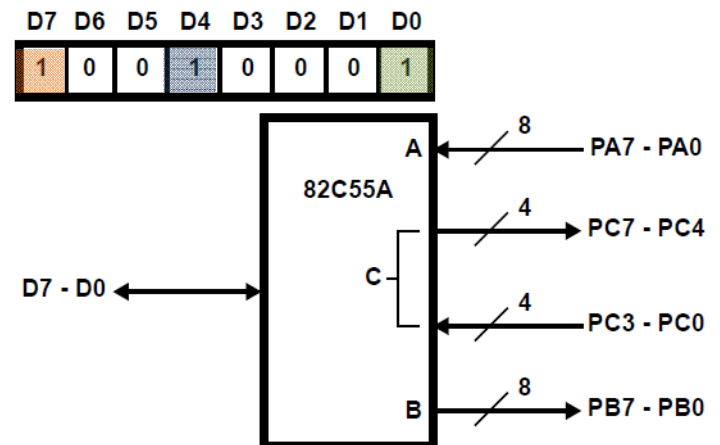
CONTROL WORD #8



CONTROL WORD #5

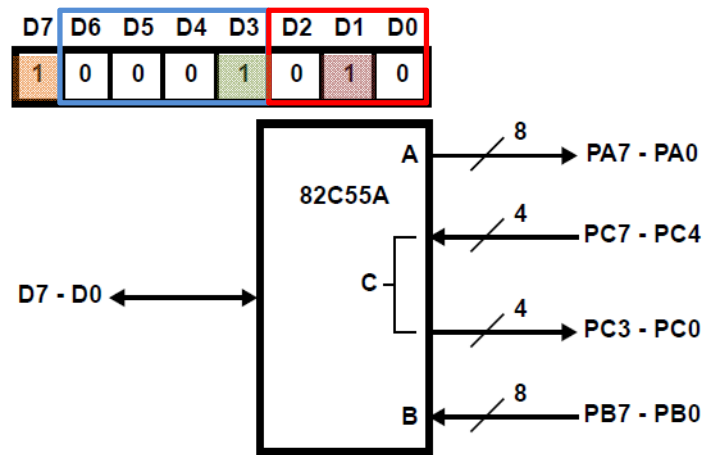


CONTROL WORD #9

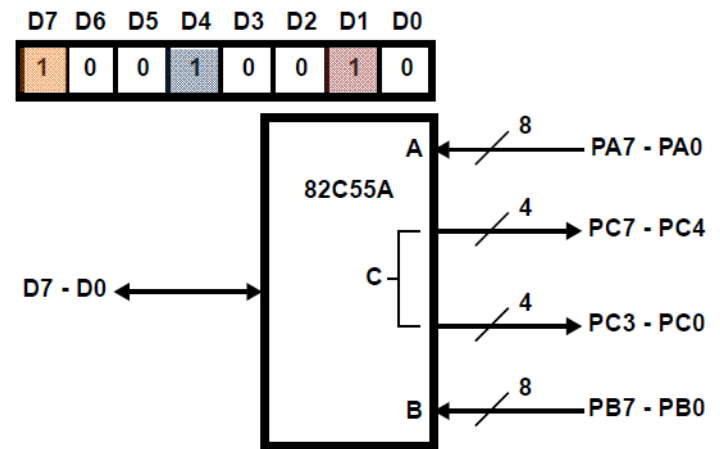


Mode 0 – Primer 3

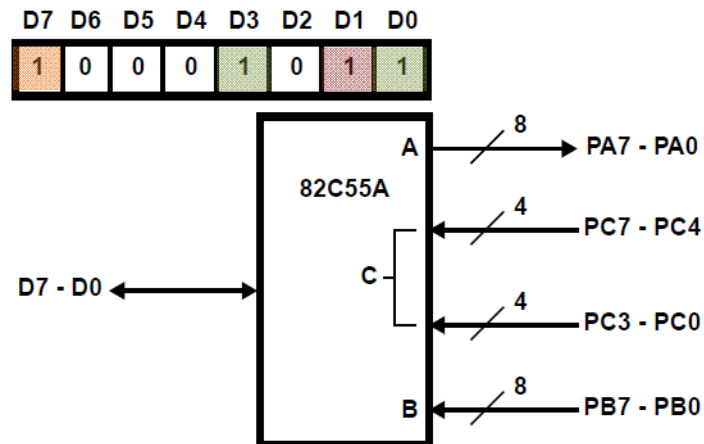
CONTROL WORD #6



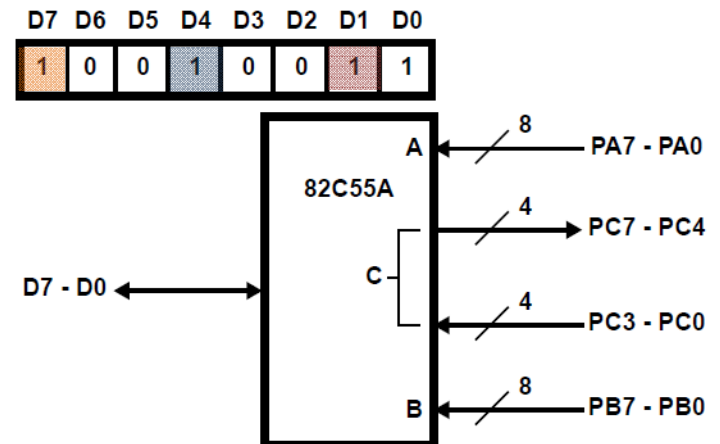
CONTROL WORD #10



CONTROL WORD #7

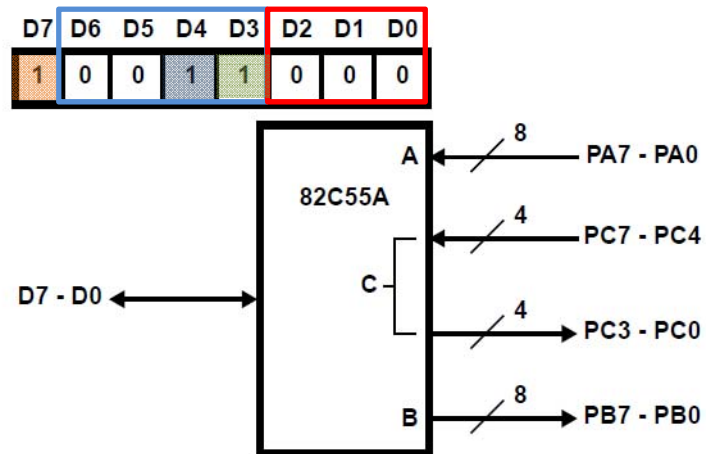


CONTROL WORD #11

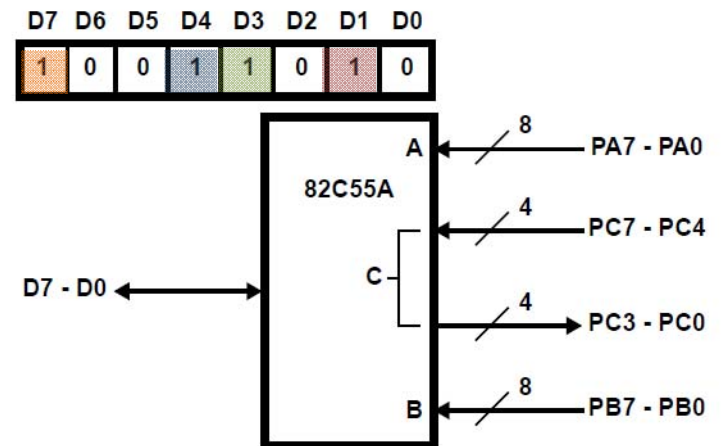


Mode 0 – Primer 4

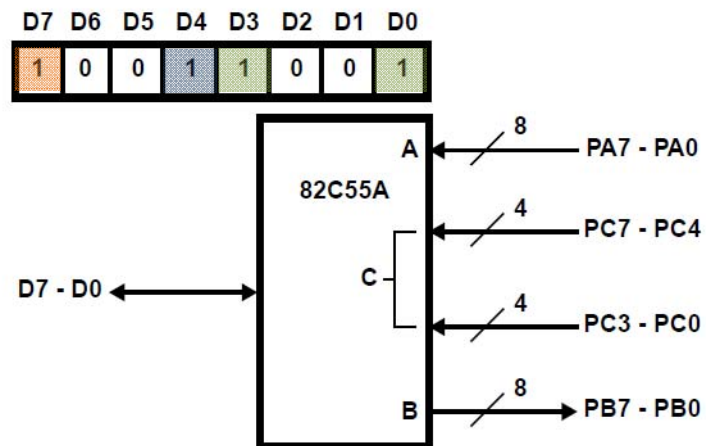
CONTROL WORD #12



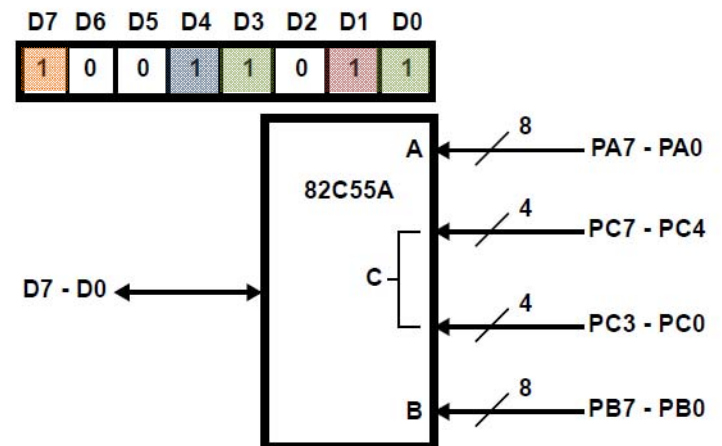
CONTROL WORD #14



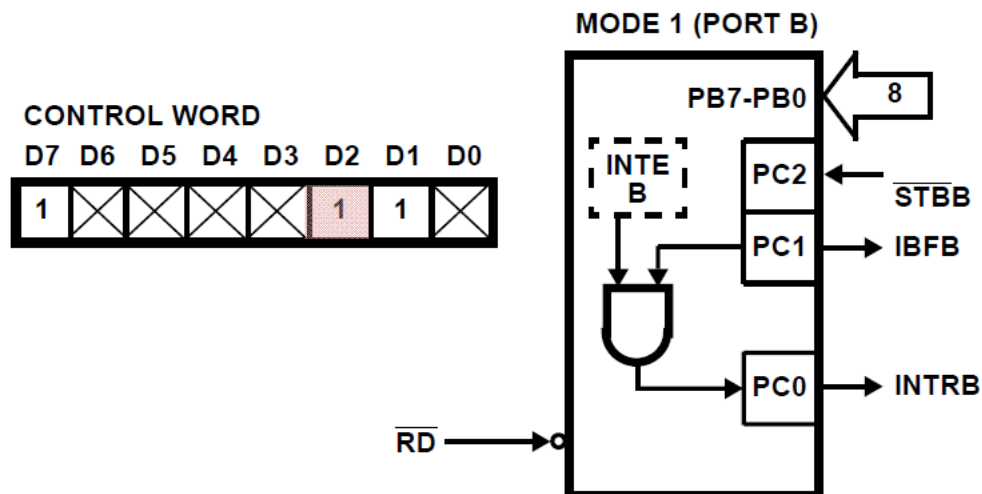
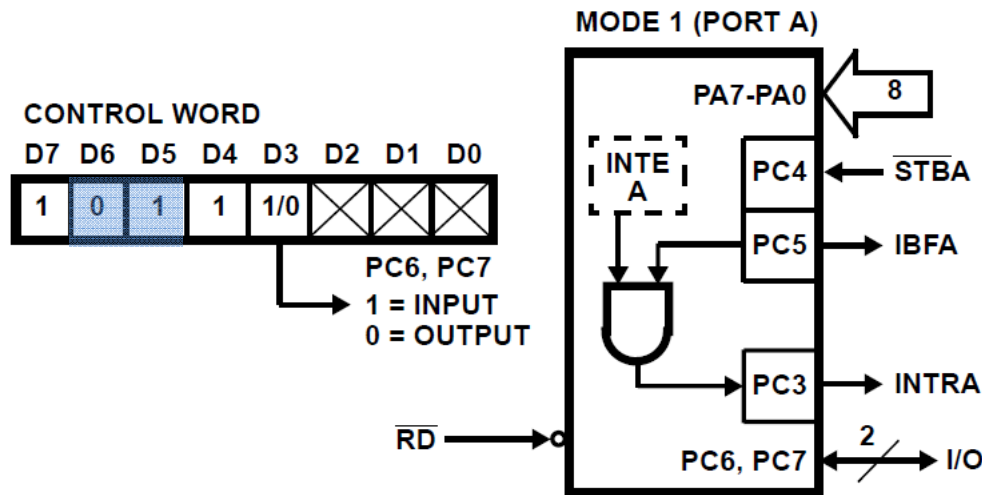
CONTROL WORD #13



CONTROL WORD #15



Mod 1 – ulaz



STB (Strobe Input) – niska vrednost učitava podatke u ulazni leč

IBF (Input Buffer Full) – visok nivo ukazuje da su podaci učitani u leč, tj. ovo je ACK za STB

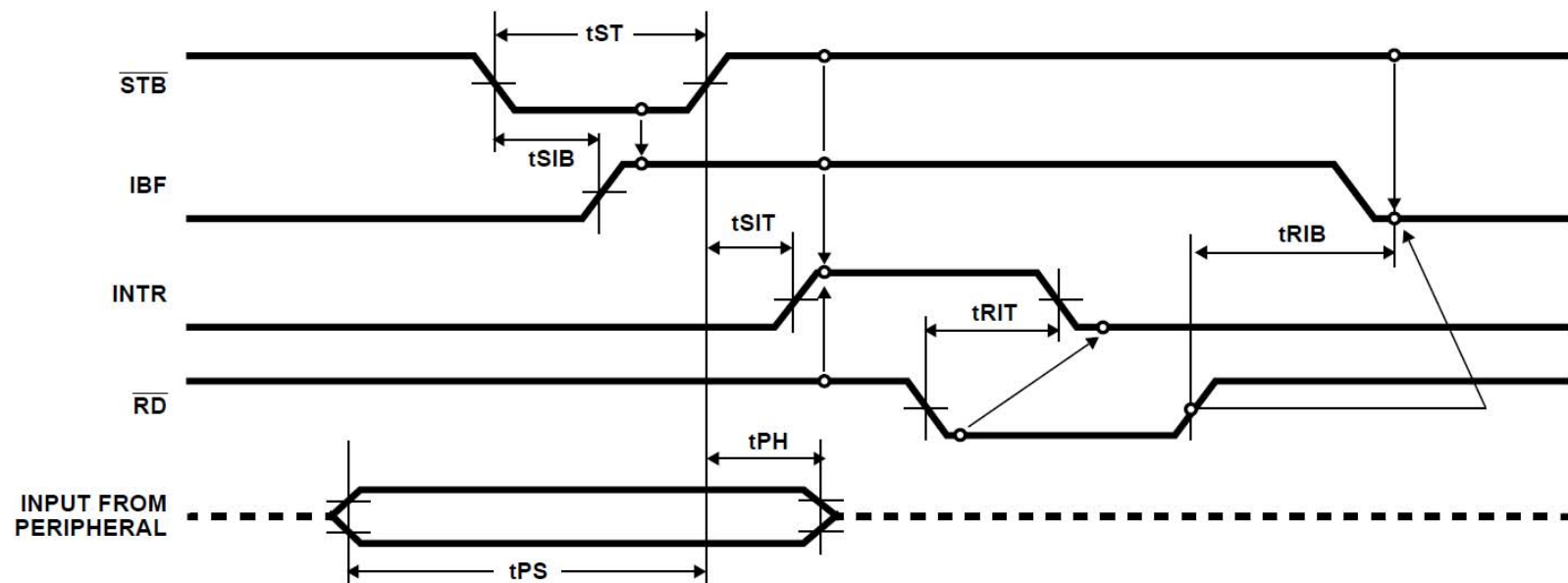
INTR (Interrupt Request) – visok nivo generiše interapt za CPU.

Generiše se kada su STB, IBF i INTE na visokom nivou, a resetuje se na padajuću ivicu RD.

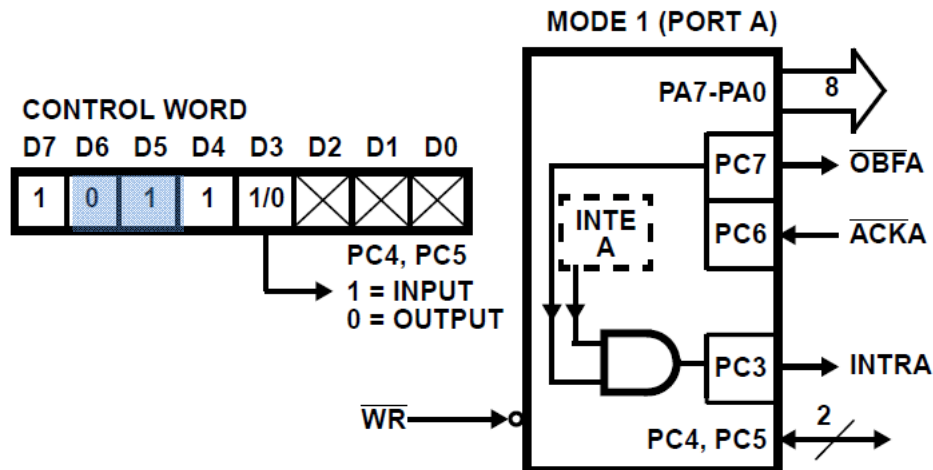
INTE (Interrupt Enabled) – kontroliše se setovanjem/resetovanje m bitova PC4 za A i PC2 za B.

Mod 1

vremenski dijagram za ulaz



Mod 1 – izlaz

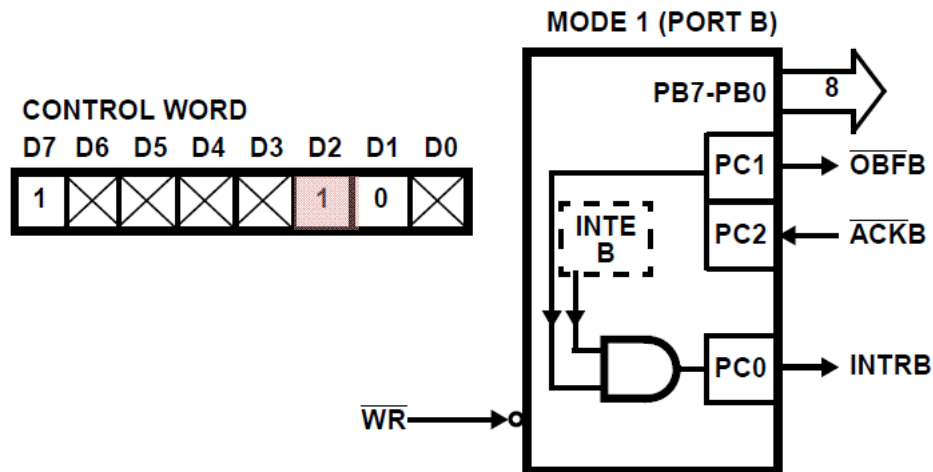


OBF (*Output Buffer Full*) – kada postane 0, ukazuje da je CPU upisao podatak.

Postavlja se na rastuću ivicu \overline{WR} , a resetuje kada \overline{ACK} postane aktivno (0).

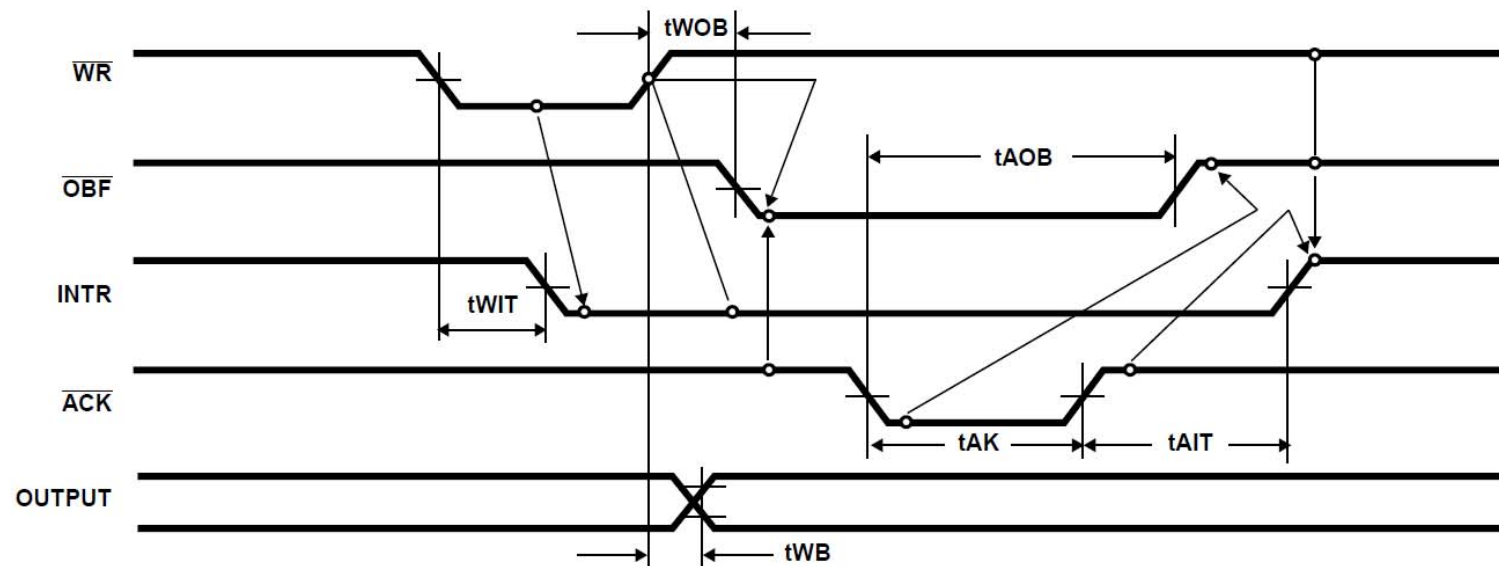
ACK (*Acknowledge Input*) – nizak nivo ukazuje da je periferija spremna da pročita podatak.

INTR (*Interrupt Request*) – visok nivo generiše interapt za CPU, kada je izlazni uređaj prihvatio poslati podatak. Generiše se kada su \overline{ACK} , OBF i INTE na visokom nivou, a resetuje se na padajuću ivicu \overline{WR} .

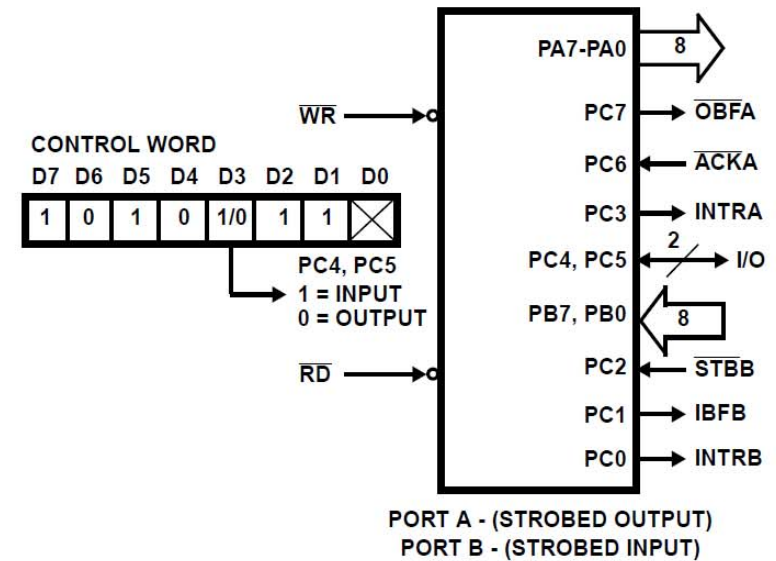
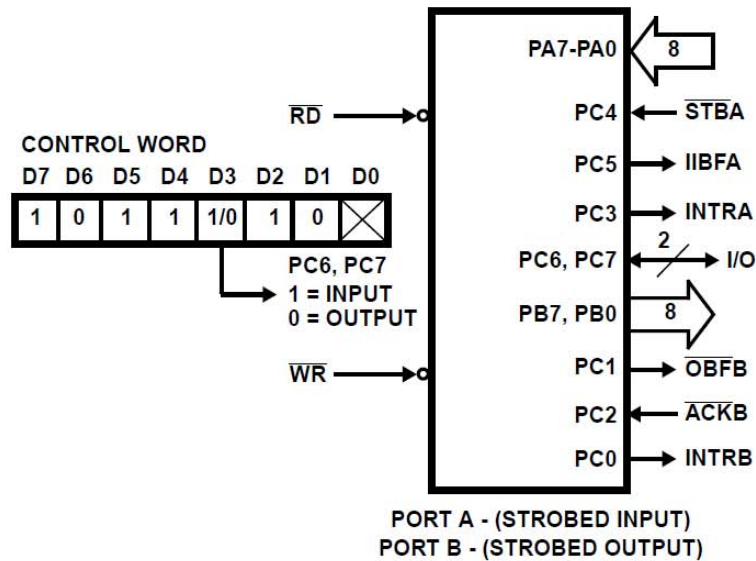


Mod 1

vremenski dijagram za izlaz

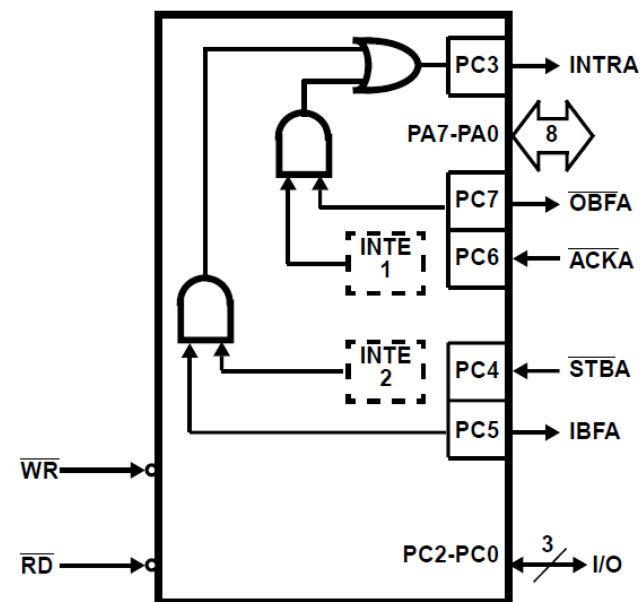
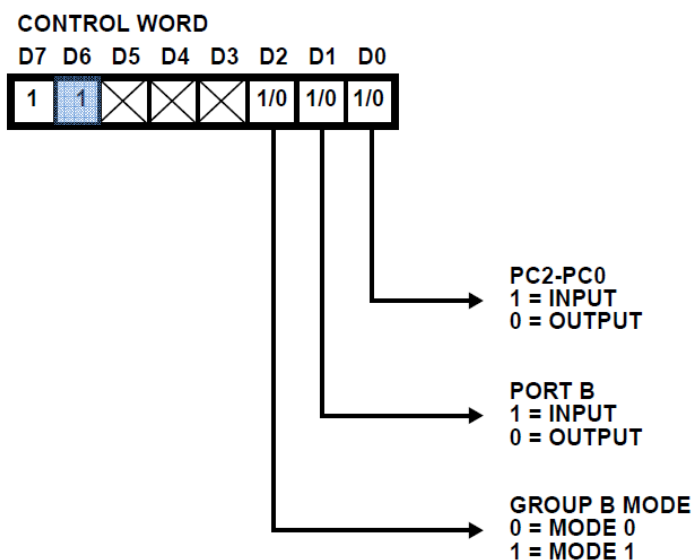


Kombinacije konfiguracija za Mod 1



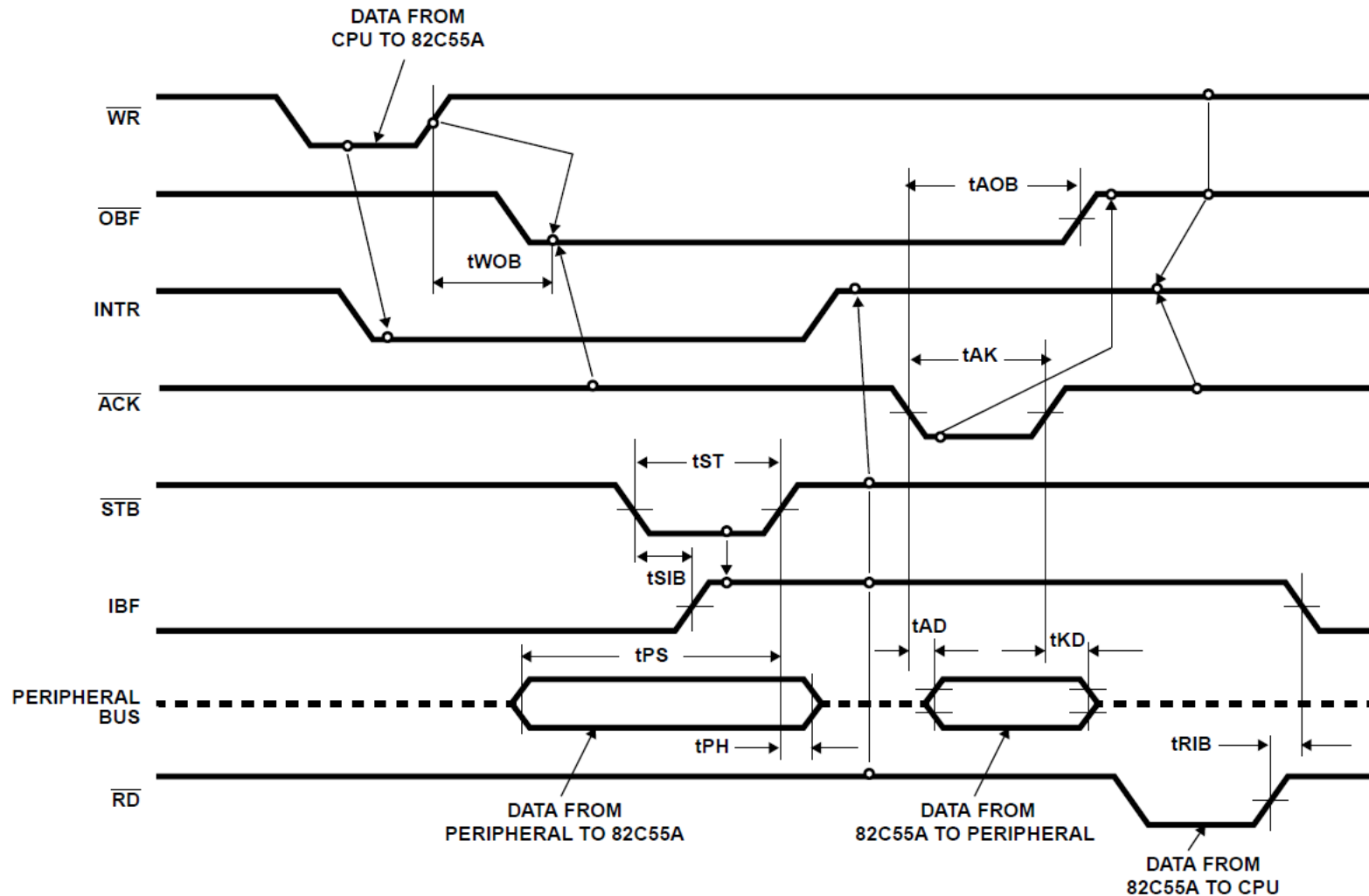
Mod 2

konfiguracija i rad



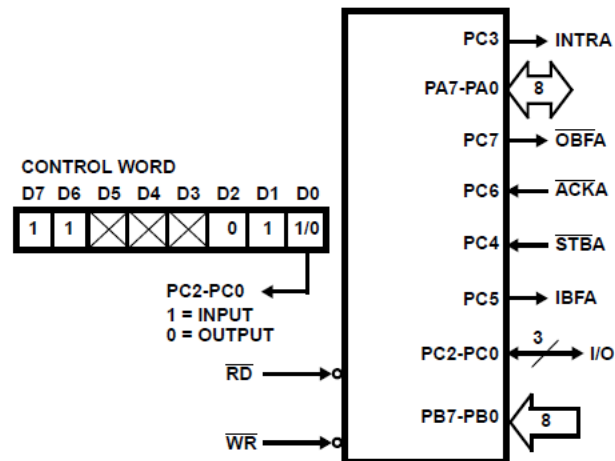
Mod 2

vremenski dijagram

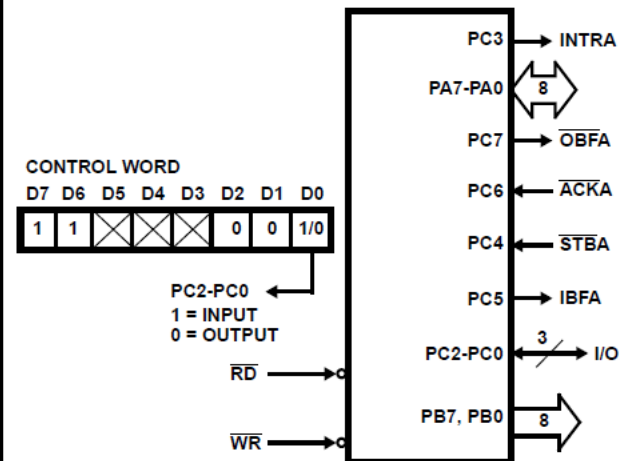


Moguće kombinacije

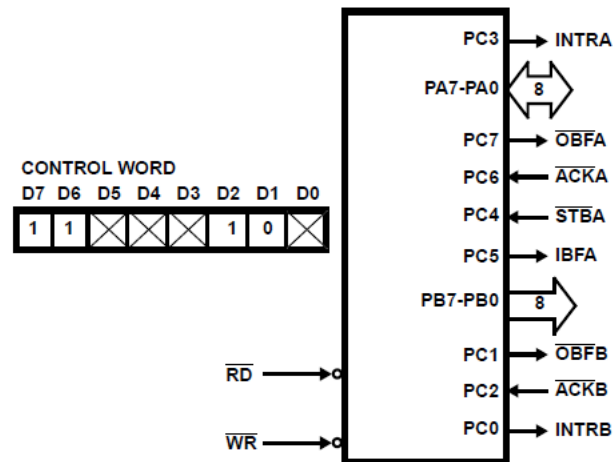
MODE 2 AND MODE 0 (INPUT)



MODE 2 AND MODE 0 (OUTPUT)



MODE 2 AND MODE 1 (OUTPUT)



MODE 2 AND MODE 1 (INPUT)

