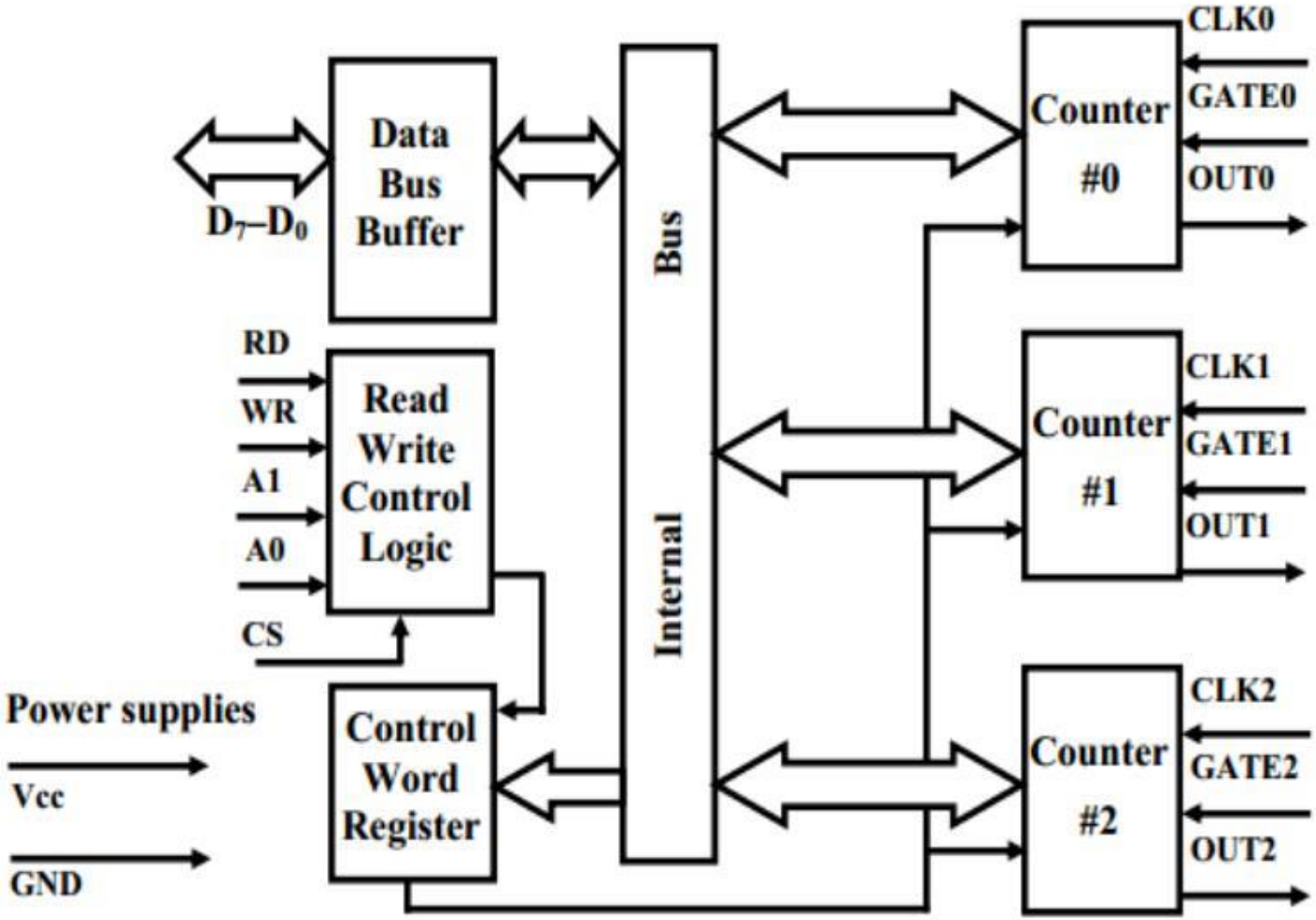
Programmable Interval Timer 8254

- The Intel 8254 is a counter/timer device designed to solve the common timing control problems in microcomputer system design.
- It provides three independent 16-bit counters, each capable of handling clock inputs up to 10 MHz.
- It has 6 modes and all are software programmable.
- The 8254 is a superset of the 8253.

8254 Block Diagram



Operating modes of 8254

- Mode 0 – Interrupt on Terminal Count
- Mode 1 – Programmable One Shot
- Mode 2 – Rate Generator
- Mode 3 – Square Wave Generator
- Mode 4 – Software Triggered Mode
- Mode 5 – Hardware Triggered Mode

Control word of 8254

Control Word Format

D_7	D_6	D_5	D_4	D_3	D_2	D_1	D_0
SC1	SC0	RW1	RW0	M2	M1	M0	BCD

SC—Select Counter

SC1	SC0	
0	0	Select Counter 0
0	1	Select Counter 1
1	0	Select Counter 2
1	1	Read-Back Command (see Read Operations)

M—Mode

M2	M1	M0	
0	0	0	Mode 0
0	0	1	Mode 1
X	1	0	Mode 2
X	1	1	Mode 3
1	0	0	Mode 4
1	0	1	Mode 5

RW—Read/Write

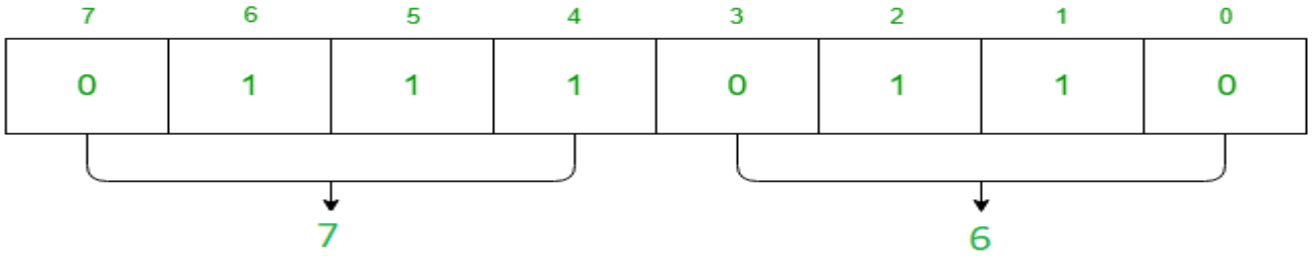
RW1	RW0	
0	0	Counter Latch Command (see Read Operations)
0	1	Read/Write least significant byte only
1	0	Read/Write most significant byte only
1	1	Read/Write least significant byte first, then most significant byte

BCD

0	Binary Counter 16-bits
1	Binary Coded Decimal (BCD) Counter (4 Decades)

Write an assembly language program in 8085 microprocessor which generates 1 KHz square waveform by using counter 1 as a binary counter if clock frequency of 8254 is 2 MHz.

- count = 2 MHz / 1 KHz = 2000 = (07D0)H
- CR



Suppose port address are C0=80H,C1=81H,C2=82H,CR =83H

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MVI  A 76
OUT 83
MVI A D0
OUT 81
MVI A 07
OUT 81
HLT
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Thanks For Watching