



READY REFERENCE FOR I/O PROGRAMMING

[Document subtitle]



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8255

Port Address Map

Address		Registers
A1	A0	
0	0	Port A
0	1	Port B
1	0	Port C
1	1	Control Register/ BSR

8255 Command word written in control register

D7	D6	D5	D4	D3	D2	D1	D0
1 Command Word is written to 8255	Mode of Port A 00 – mode0 (Simple I/O) 01 – mode 1 1X – mode 2		Port A 0 – o/p 1 – i/p	Upper Port C 0 – o/p 1 – i/p	Mode of Port B 0 – Mode0 Mode1	Port A 0 – o/p 1 – i/p	Lower Port C 0 – o/p 1 – i/p

BSR of 8255 – written into control register

D7	D6	D5	D4	D3	D2	D1	D0
0 BSR	0	0	0	Port C Pin 000 – PC0 001 – PC1 010 – PC2 011 – PC3 100 – PC4 101 – PC5 110 – PC6 111 – PC&			0 – Reset Bit 1 – Set Bit

8254 Command word written into control register

Port Address Map

Address		Registers
A1	A0	
0	0	Timer 0
0	1	Timer 1
1	0	Timer 2
1	1	Control Register

8253/8254 Control Register 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
Selects Counter		Read/Write Control		Timer Mode			0 - binary 0000 _h FFFF _h 1 - BCD 0000 9999
00	Counter 0	00	Latch Counter	000	Interrupt on T/C		
01	Counter 1	01	R/W LSB	001	h/w Re-Triggerable one shot		
10	Counter 2	10	R/W MSB	010	rate generator		
11	Read Back Command	11	R/W LSB followed by MSB	011	Square wave generator		
				1x0	s/w triggered strobe		
				1x1	h/w triggered strobe		

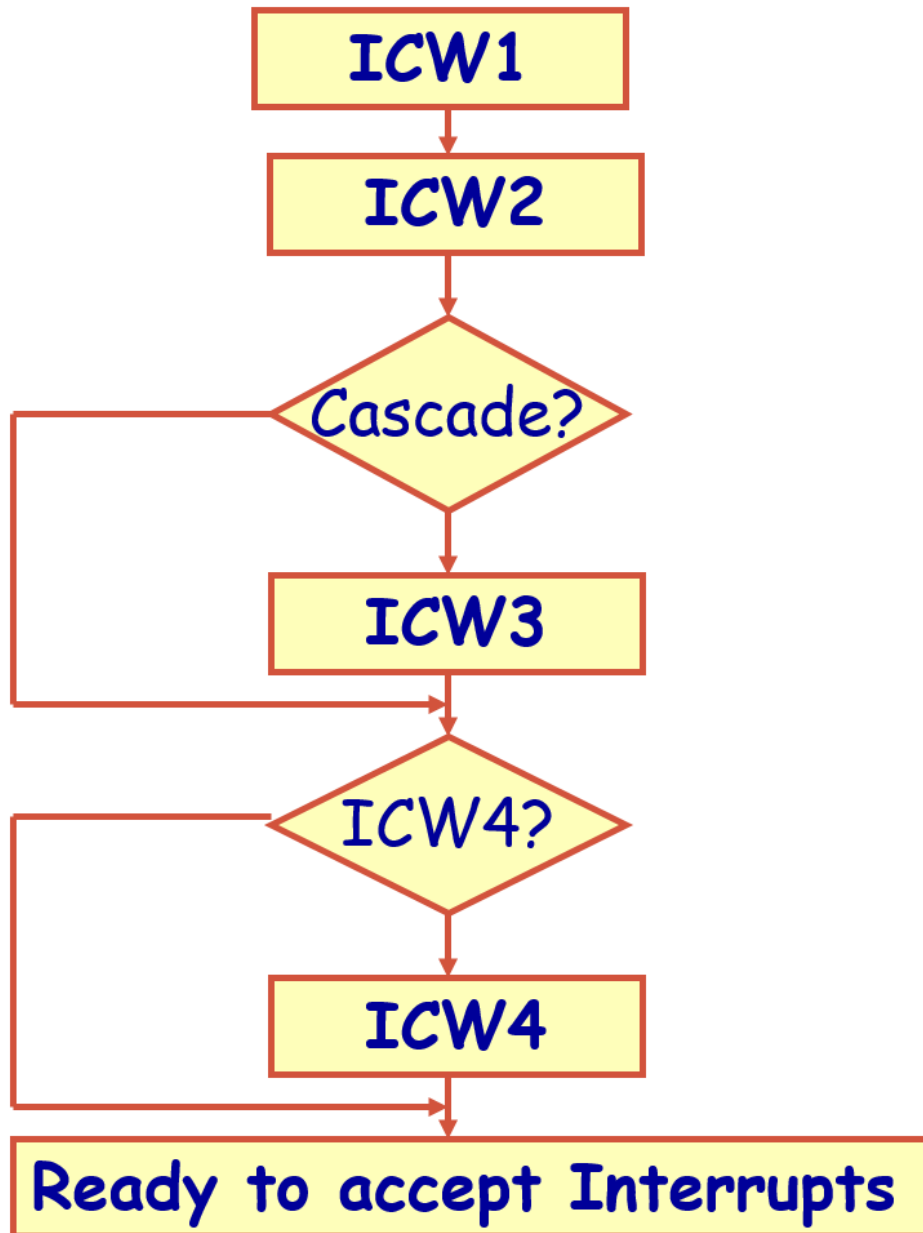
8254 Read Back Command – written into control register

1	1	Count	Status	C2	C1	C0	0
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Count – 0 – Read Count
 Status – 0 – Read Status

C2 - 1 - Read from Timer2
 C1 - 1 - Read from Timer 1
 C0 - 1 - Read From Timer 0

Programming Order



You can give OCW1 at this point to unmask individual interrupt request.

OCW2 is usually given at the end of the ISR

8259 Registers

8259 Initialization Command Words

ICW _x	A ₀	D ₇	D ₆	D ₅	D ₄	D ₃	D ₂	D ₁	D ₀	
1	0	A ₇	A ₆	A ₅	1	LTIM 1 - Level Trigger	ADI	SNGL 1 - 8259	IC4 1 - ICW4 reqd (1 - for all 80x86)	
2	1	A ₁₅ T ₇	A ₁₄ T ₆	A ₁₃ T ₅	A ₁₂ T ₄	A ₁₁ T ₃	A ₁₀	A ₉	A ₈	
		Starting vector no - for e.g if starting vector no is 40 _H - 0100 0 (T ₇ -T ₃)								
4	1	0	0	0	SFNM	BUF	M/S	AEOI (1 - enable automatic EOI)	μPM (1 - for all 80x86)	

Columns marked in yellow – not used for 8259

M/S – 1 for Master – 0 for Slave in a Cascaded 8259 System

SFNM & BUF – can be normally placed at zero

8259 – ICW 3 for Master Slave

ICW _x	A ₀	D ₇	D ₆	D ₅	D ₄	D ₃	D ₂	D ₁	D ₀
3	1	S ₇	S ₆	S ₅	S ₄	S ₃	S ₂	S ₁	S ₀
3S	1	0	0	0	0	0	ID ₂	ID ₁	ID ₀

In the master If Slave is connected to IR3 – S 3 made 1

In the slave ID₂ ID₁ ID₀ will be 011

8259 – Operation Command Words

OCW _x	A ₀	D ₇	D ₆	D ₅	D ₄	D ₃	D ₂	D ₁	D ₀
1	1	M ₇	M ₆	M ₅	M ₄	M ₃	M ₂	M ₁	M ₀
2	0	R	SL	EOI	0	0	L ₂	L ₁	L ₀
		R	SL	EOI	Purpose				
		0	0	1	Non-specific EOI				
		0	1	1	Specific EOI				
		1	0	1	Rotate on non-specific EOI				
		1	0	0	Rotate on AEOI				
		1	1	1	Rotate on specific EOI				
		1	1	0	Set priority				

OCW₁ is used masking individual interrupt requests – if IR₁ IR₂ IR₃ are to be masked M₃M₂M₁ are made 1

If SL = 1 L₂L₁L₀ will have the Value of the Level.