



# LECTURE 22, 23

## PIC Memory Organization



# Topics to be covered

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- PIC microcontroller has 13 bits of program memory address.
- Hence it can address up to 8k of program memory.
- The program counter is 13-bit. PIC 16C6X or 16C7X program memory is 2k or 4k. While addressing 2k of program memory, only 11- bits are required. Hence two most significant bits of the program counter are ignored.
- Similarly, while addressing 4k of memory, 12 bits are required. Hence the MSB of the program counter is ignored.

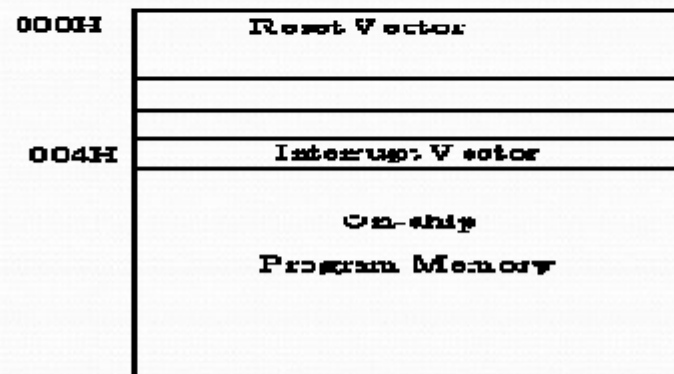
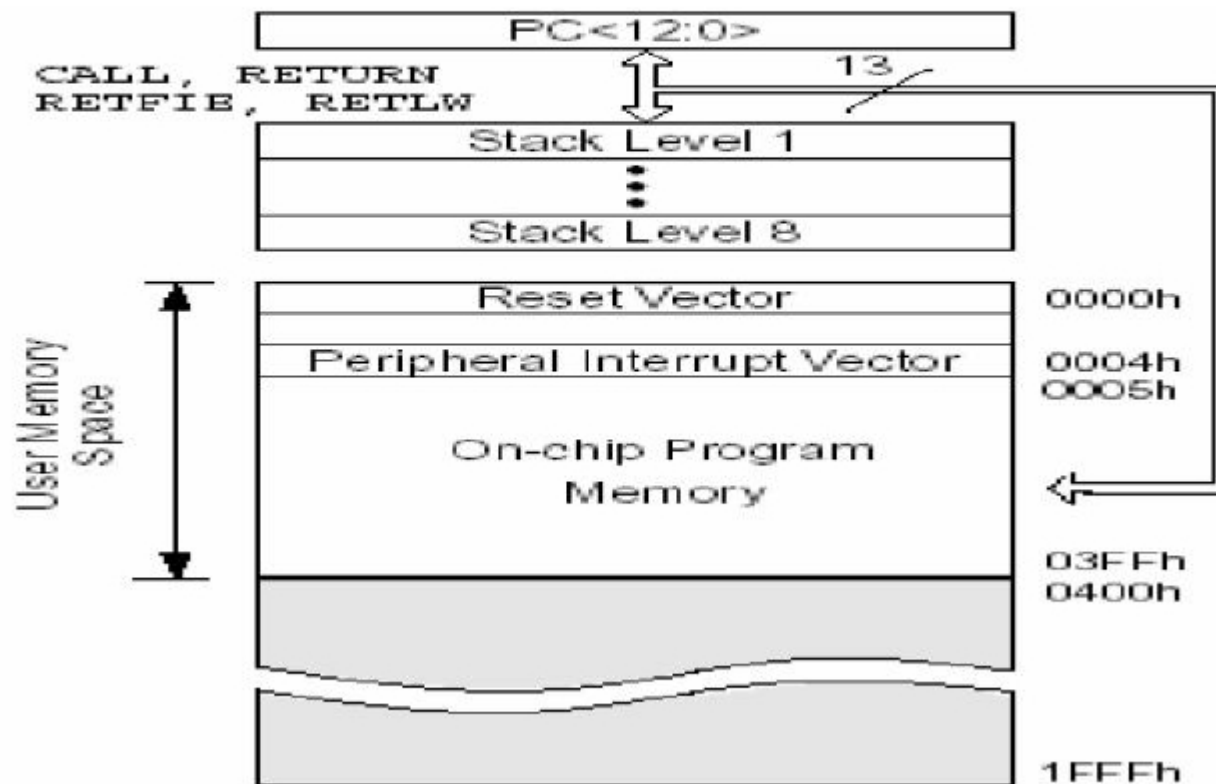


Fig 4. Program Memory map

# Program Memory

- PIC 16c6X/7X is 2K or 4K.
- 11 bit or 12 bit address is used out of 13 bits in PC.
- Maximum memory that can be accessed is 8K.
- After reset program counter is cleared.
- At 0000h there is "goto Mainline" Instruction which takes PC to 0005h.

# Program Memory Contd..





# Data Memory

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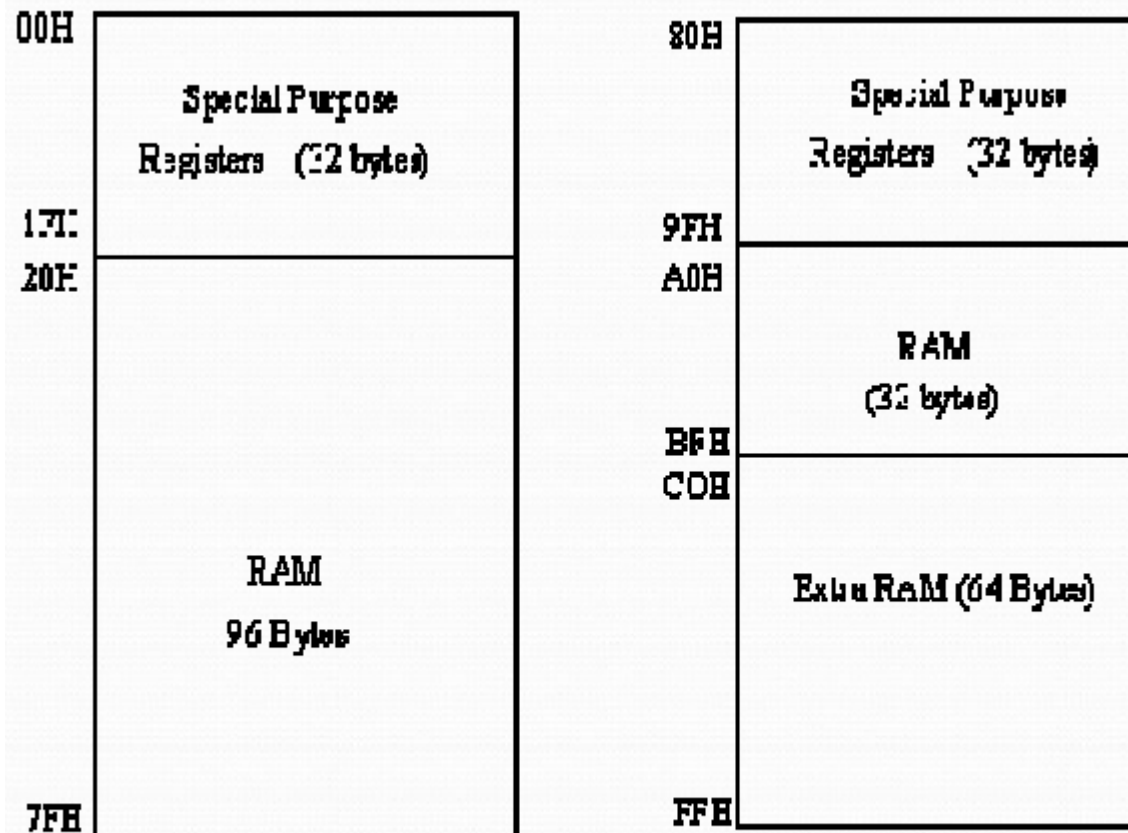
- **Register File Structure.**

They are the memory locations that are addressed by instruction.

There is **general purpose** and **special purpose** register file.

General purpose are 8 bit RAM locations and special purpose are I/O ports and control registers.

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**Data Memory map**

### Specifications of some popular PIC microcontrollers:

Device	Program Memory (14bits)	Data RAM (bytes)	I/O Pins	ADC	Timers 8/16 bits	CCP (PWM)	USART SPI / I <sup>2</sup> C
16C74A	4K EPROM	192	33	8 bits x 8 channels	2/1	2	USART SPI / I <sup>2</sup> C
16F877	8K Flash	368 (RAM) 256 (EEPROM)	33	10 bits x 8 channels	2/1	2	USART SPI / I <sup>2</sup> C
Device	Interrupt Sources	Instruction Set					
16C74A	12	35					
16F877	15	35					