Capture / Compare / PWM (CCP) Modules

- A register that can record the time of an event is called a 'Capture[3] register.
- A register that can generate an event by comparing for equality of a preset value in a register i.e. PR2 to a running timer is called a 'Compare[3] register.
- PIC16 Series MCUs combine these Capture and Compare functions and some more functions in their CCP modules.
- CCP modules interact with both Timer 1 and Timer 2.
- 16 F87XA has two CCP modules.
- Each module has two 8-bit registers, CCPR1L, CCPR1H and CCPR2L, CCPR2H.
- Two 8-bit registers in each module forming a 16-bit register, can be used for capture, compare or to form the duty cycle of a PWM signal.
- CCP modules are controlled by CCP1CON and CCP2CON registers.

Capture / Compare / PWM (CCP) Modules

U-0	U-0	R/W-0	R/W-0	R/W-0	R/W-0	R/W-0	R/W-0
—	—	CCPxX	CCPxY	CCPxM3	CCPxM2	CCPxM1	CCPxM0
bit 7							bit 0

bit 7-6 **Unimplemented:** Read as '0'

bit 5-4 **CCPxX:CCPxY:** PWM Least Significant bits

Capture mode:
Unused.

Compare mode:
Unused.

PWM mode:
These bits are the two LSbs of the PWM duty cycle. The eight MSbs are found in CCPRxL.

bit 3-0 **CCPxM3:CCPxM0:** CCPx Mode Select bits

0000 = Capture/Compare/PWM disabled (resets CCPx module)
0100 = Capture mode, every falling edge
0101 = Capture mode, every rising edge
0110 = Capture mode, every 4th rising edge
0111 = Capture mode, every 16th rising edge
1000 = Compare mode, set output on match (CCPxIF bit is set)
1001 = Compare mode, clear output on match (CCPxIF bit is set)
1010 = Compare mode, generate software interrupt on match (CCPxIF bit is set, CCPx pin is unaffected)
1011 = Compare mode, trigger special event (CCPxIF bit is set, CCPx pin is unaffected); CCP1 resets TMR1; CCP2 resets TMR1 and starts an A/D conversion (if A/D module is enabled)
11xx = PWM mode

Figure 9.7 The CCP1CON/CCP2CON registers (addresses 17_H and $1D_H$ respectively)