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;*****
; HD44780 LCD Routines
;*****
POR
;POR according to Hitachi datasheet. NB: RB<0:3> are mapped to display lines
;DB<4:7>, in order. Use PutNib for the POR until 4-bit mode is set. A swapf
;is not needed in PutNib as the lower 4 bits of PORTB are sent first and only
;those bits are sent.

    DelayCy    (100*msecs)
    movlw     0x03
    call      PutNib
    DelayCy    (5*msecs)
    movlw     0x03
    call      PutNib
    DelayCy    (1*msecs)
    movlw     0x03
    call      PutNib
    movlw     0x02          ;Function set: read as 0x20
    call      PutNib       ;4-bit mode is now set, N & F not defined yet

;LCD is now in 4-bitmode and 8-bit instructions and data are sent as two nibbles.

    movlw     0x28          ;Function set: 8 bits sent 4-bit mode
    call      PutCmd        ;N & F are now defined
    movlw     0x08          ;Display on/off control: display off
    call      PutCmd
    DelayCy    (150*msecs)   ;blinks screen (optional)
    DelayCy    (150*msecs)   ;blinks screen (optional)
    movlw     0x01          ;Clear display: clears display
    call      PutCmd
    DelayCy    (2*msecs)
    movlw     0x06          ;Entry mode set: increment address (cursor)
    call      PutCmd
    movlw     0x0C          ;Display on/off: display on/cursor off/blink off
    call      PutCmd

    return
;*****
;LCD Subroutines
;*****
PutNib
    movwf     PORTB          ;PORTB is bits <0:3> i.e., lower nibble only
    bsf       E              ;this routine only send the low nibble
    bcf       E
;    call      WNB
    DelayCy    (50*usecs)
    return

PutCmd
    bcf       RS
    goto      $+2

PutDat
    bsf       RS
    movwf     PORTB
    swapf     PORTB,f
;Since PORTB is low nibble, swap low and high to put high in lower nibble and
;send first.
    bsf       E
    bcf       E
    movwf     PORTB
    bsf       E
    bcf       E
;    call      WNB
    DelayCy    (50*usecs)
    return

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