```
;ColorRotate Using Rotate Bits
    list        p=16F628A
    #include <p16F628A.inc>

    __CONFIG _CP_OFF & _WDT_OFF & _PWRTE_ON & _INTOSC_OSC_NOCLKOUT & _LVP_OFF
        errorlevel   -302         ; supress banksel warning messages during assembly
        errorlevel   -311         ; supress HIGH operator warning messages during assembly
        errorlevel   -305
        radix   dec               ;if numbers are not identified defaul to decimal system

    cblock0x20                    ;declare variables used in the program
        ltime
        dtime
        LoopCount                 ;use as nested loop to slow things down
        LoopCount2
        LoopCount3
        Color1                    ;3 sets of 3 variables (next 9 variables)
        Color2                    ;to select and rotate and place
        Color3                    ;colors where needed
        Col1
        Col2
        Col3
        L1High
        L1Low
        L2High
        L2Low
        L3High
        L3Low
        L4High
        L4Low
        L5High
        L5Low
        L6High
        L6Low
        L7High
        L7Low
        L8High
        L8Low
        L9High
        L9Low
        L10High
        L10Low
        L11High
        L11Low
        L12High
        L12Low
    endc
#define     bank0   bcf     STATUS,RP0
```

```
#define     bank1   bsf     STATUS,RP0
RESET_VECTOR    org     0x000
;-------------------------------------------------------------------------------
;                   Macros                                      |
;-------------------------------------------------------------------------------
Paint   macro   Col1,Col2,Col3
        movlw   Col1<<4         ;user provided colors
        movwf   Color1          ;are read and placed
        movlw   Col2<<4         ;in left 4 bits of each
        movwf   Color2          ;color variable
        movlw   Col3<<4         ;at later time added to
        movwf   Color3          ;PORTA portion of data line
        call    Animate         ;main program
        call    Animate         ;is called 3 times
        call    Animate         ;to loop the same colors 3 times
        endm                    ;before user provides 3 new colors
;-------------------------------------------------------------------------------
;           Main Code Starts Here                              |
;-------------------------------------------------------------------------------
START
    movlw  b'00000111'          ;Set all ports as outputs
    movwf  CMCON                ;Disable comparators
    bank1
    clrf TRISA
    clrf TRISB
    bank0
;------------------------------------
Sequence
    call    MegaColor
    goto    Sequence
;----------------------------------------------------------------
;                   Color Entries                      |
;----------------------------------------------------------------
MegaColor
    Paint   b'0001',b'0100',b'1000'     ;User provides 3 colors to rotate 3 times
    Paint   b'0001',b'0101',b'0100'     ;then select 3 new colors and repeat
    Paint   b'0001',b'0001',b'0101'     ;comment all the lines except one
    Paint   b'0001',b'0100',b'0100'     ;to loop the same colors over
    Paint   b'0001',b'1000',b'0001'     ;color choices are:
    Paint   b'0001',b'0001',b'1000'     ;0001=red, 0101=yel, 0100=green
    Paint   b'0001',b'1001',b'1000'     ;1100=aqua, 1000=blue, 1001=magenta
    Paint   b'0001',b'1001',b'1001'     ;1101=white, 0000=black
    Paint   b'0001',b'0001',b'1001'
    Paint   b'0101',b'0101',b'0001'
    Paint   b'0101',b'0101',b'0100'
    Paint   b'0101',b'0101',b'1100'
    Paint   b'0101',b'0101',b'1000'
    Paint   b'0101',b'0101',b'1001'
    Paint   b'0101',b'1001',b'1100'
```

```
        Paint    b'0101',b'0100',b'1100'
        Paint    b'0101',b'1001',b'1001'
        Paint    b'0101',b'1101',b'0001'
        Paint    b'0101',b'1101',b'0100'
        Paint    b'0101',b'1101',b'1000'
        Paint    b'0100',b'1101',b'1000'
        Paint    b'0100',b'1000',b'1000'
        Paint    b'0100',b'0100',b'1000'
        Paint    b'0100',b'1100',b'1000'
        Paint    b'0100',b'1100',b'1100'
        Paint    b'0100',b'1101',b'1100'
        Paint    b'0100',b'1001',b'1001'
        Paint    b'0100',b'0100',b'0101'
        Paint    b'0100',b'0100',b'1100'
        Paint    b'0100',b'0100',b'1001'
        Paint    b'1000',b'1001',b'0001'
        Paint    b'1000',b'1001',b'1001'
        Paint    b'1000',b'1101',b'0001'
        Paint    b'1000',b'1100',b'1100'
        Paint    b'1000',b'1101',b'1001'
        Paint    b'1001',b'1001',b'1101'
        Paint    b'1001',b'0101',b'1101'
        Paint    b'1001',b'1001',b'0100'
        Paint    b'1001',b'1001',b'1100'
        Paint    b'1001',b'1101',b'1100'
        Paint    b'0001',b'0000',b'0000'
        Paint    b'0101',b'0000',b'0000'
        Paint    b'0100',b'0000',b'0000'
        Paint    b'1100',b'0000',b'0000'
        Paint    b'1000',b'0000',b'0000'
        Paint    b'1001',b'0000',b'0000'
;
            return

;---------------------------------------------------------------
;                 Main Program Engine              |
;---------------------------------------------------------------
Animate
        call     Initial_Lines
        call     Display_Rotate
        return
;-----------------------------------------
Display_Rotate
        movlw    d'12'
        movwf    LoopCount
LR1
        call     Display_Lines
        call     Rotate_Lines
        decfsz   LoopCount,F
        goto     LR1
```

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```
        return
;-----------------------------------------
Display_Lines
        movlw  d'255'
        movlw  LoopCount2
LC2
        movlw  d'10'
        movwf  LoopCount3
LC3
        movfw  Color1
        addwf  L1High,0
        movwf  PORTA
        movfw  L1Low
        movwf  PORTB
;-----------------------------
        movfw  Color1
        addwf  L2High,0
        movwf  PORTA
        movfw  L2Low
        movwf  PORTB
;-----------------------------
        movfw  Color1
        addwf  L3High,0
        movwf  PORTA
        movfw  L3Low
        movwf  PORTB
;-----------------------------
        movfw  Color1
        addwf  L4High,0
        movwf  PORTA
        movfw  L4Low
        movwf  PORTB
;-----------------------------
        movfw  Color2
        addwf  L5High,0
        movwf  PORTA
        movfw  L5Low
        movwf  PORTB
;-----------------------------
        movfw  Color2
        addwf  L6High,0
        movwf  PORTA
        movfw  L6Low
        movwf  PORTB
;-----------------------------
        movfw  Color2
        addwf  L7High,0
        movwf  PORTA
        movfw  L7Low
```

```
        movwf PORTB
;------------------------------
        movfw Color2
        addwf L8High,0
        movwf PORTA
        movfw L8Low
        movwf PORTB
;------------------------------
        movfw Color3
        addwf L9High,0
        movwf PORTA
        movfw L9Low
        movwf PORTB
;------------------------------
        movfw Color3
        addwf L10High,0
        movwf PORTA
        movfw L10Low
        movwf PORTB
;------------------------------
        movfw Color3
        addwf L11High,0
        movwf PORTA
        movfw L11Low
        movwf PORTB
;------------------------------
        movfw Color3
        addwf L12High,0
        movwf PORTA
        movfw L12Low
        movwf PORTB
;
        decfsz LoopCount3
        goto   LC3
        decfsz LoopCount2
        goto   LC2
        return
;-----------------------------------------------------------
Rotate_Lines
        clrc
        btfsc  L1High,3
        setc
        rlf    L1Low,F
        rlf    L1High,W
        andlw  b'00001111'
        movwf  L1High
;
        clrc
        btfsc  L2High,3
```

```
        setc
        rlf     L2Low,F
        rlf     L2High,W
        andlw   b'00001111'
        movwf   L2High
;
        clrc
        btfsc   L3High,3
        setc
        rlf     L3Low,F
        rlf     L3High,W
        andlw   b'00001111'
        movwf   L3High
;
        clrc
        btfsc   L4High,3
        setc
        rlf     L4Low,F
        rlf     L4High,W
        andlw   b'00001111'
        movwf   L4High
;
        clrc
        btfsc   L5High,3
        setc
        rlf     L5Low,F
        rlf     L5High,W
        andlw   b'00001111'
        movwf   L5High
;
        clrc
        btfsc   L6High,3
        setc
        rlf     L6Low,F
        rlf     L6High,W
        andlw   b'00001111'
        movwf   L6High
;
        clrc
        btfsc   L7High,3
        setc
        rlf     L7Low,F
        rlf     L7High,W
        andlw   b'00001111'
        movwf   L7High
;
        clrc
        btfsc   L8High,3
        setc
```

```
        rlf     L8Low,F
        rlf     L8High,W
        andlw   b'00001111'
        movwf   L8High
;
        clrc
        btfsc   L9High,3
        setc
        rlf     L9Low,F
        rlf     L9High,W
        andlw   b'00001111'
        movwf   L9High
;
        clrc
        btfsc   L10High,3
        setc
        rlf     L10Low,F
        rlf     L10High,W
        andlw   b'00001111'
        movwf   L10High
;
        clrc
        btfsc   L11High,3
        setc
        rlf     L11Low,F
        rlf     L11High,W
        andlw   b'00001111'
        movwf   L11High
;
        clrc
        btfsc   L12High,3
        setc
        rlf     L12Low,F
        rlf     L12High,W
        andlw   b'00001111'
        movwf   L12High
;
        return
;-------------------------------------------------------------
Initial_Lines
        movlw   b'00001110'
        movwf   L1High
        movlw   b'00001111'
        movwf   L1Low
        movlw   b'00001100'
        movwf   L2High
        movlw   b'00000111'
        movwf   L2Low
        movlw   b'00001000'
```

```
        movwf  L3High
        movlw  b'00000011'
        movwf  L3Low
        movlw  b'00000000'
        movwf  L4High
        movlw  b'00000001'
        movwf  L4Low
        movlw  b'00000000'
        movwf  L5High
        movlw  b'11111110'
        movwf  L5Low
        movlw  b'00000000'
        movwf  L6High
        movlw  b'01111100'
        movwf  L6Low
        movlw  b'00000000'
        movwf  L7High
        movlw  b'00111000'
        movwf  L7Low
        movlw  b'00000000'
        movwf  L8High
        movlw  b'00010000'
        movwf  L8Low
        movlw  b'00001111'
        movwf  L9High
        movlw  b'11100000'
        movwf  L9Low
        movlw  b'00000111'
        movwf  L10High
        movlw  b'11000000'
        movwf  L10Low
        movlw  b'00000011'
        movwf  L11High
        movlw  b'10000000'
        movwf  L11Low
        movlw  b'00000001'
        movwf  L12High
        movlw  b'00000000'
        movwf  L12Low
;
        return
;-----------------------------------
  end
```