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;
;           Leilani Electronics
;   program written & tested by William E. Nickles
;           5X7 Dot Matrix display test board
;           rev.2 6/26/2012
;

        list      p=16f819
        __config  h'3f38'
        radix     hex
status   equ      0x03
porta    equ      0x05
portb    equ      0x06
intcon   equ      0x0b
option_reg equ    0x81
trisa    equ      0x85
trisb    equ      0x86
oscccon  equ      0x8f
osctune  equ      0x90
adcon1   equ      0x9f
count0   equ      0x21
count1   equ      0x22
;
c         equ      0           ; carrier flag
z         equ      2           ; zero flag
rp0       equ      5           ; bank select
;   porta
r3        equ      0           ; row-3
r4        equ      1           ; row-4
r5        equ      2           ; row-5
sel       equ      3           ; c.a/c.c selection
;
;mc1r     equ      5           ; uc reset
r1        equ      6           ; row-1
r2        equ      7           ; row-2
;   portb
;int      equ      0           ; uc interrupt
colm1     equ      1           ; col-1
colm2     equ      2           ; col-2
colm3     equ      3           ; col-3
colm4     equ      4           ; col-4
colm5     equ      5           ; col-5
colm6     equ      6           ; col-6
colm7     equ      7           ; col-7
;
        org      0x00
        goto     start
;
start     clrf     porta        ; clear porta & portb
          clrf     portb
          bsf      status,rp0   ; switch to bank1
          movlw    0x64         ; set internal osc to 4mhz
          movwf    oscccon
          movlw    0x3f         ; tune osc to max freq
          movwf    osctune
          movlw    0x06         ; disable pic's adc & configure
          movwf    adcon1       ; ports for digital i/o's
          movlw    0x28         ; set porta i/o's
          movwf    trisa
          movlw    0x01
          movwf    trisb
          bcf      status,rp0   ; switch to bank0
;
dm_check  btfss    porta,sel    ; check for c.a or c.c
          goto     test_c       ; test c.c display
test_a    call     clear        ; test c.a display, clear display
          call     row1_a       ; turn on row-1
          call     patt_a
          call     row2_a       ; turn on row-2
          call     patt_a
          call     row3_a       ; turn on row-3
          call     patt_a

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    call    row4_a          ; turn on row-4
    call    patt_a
    call    row5_a          ; turn on row-5
    call    patt_a
    goto    dm_check
;
test_c    call    clear      ; test c.c display, clear display
          call    row1_c      ; turn on row-1
          call    patt_c
          call    row2_c      ; turn on row-2
          call    patt_c
          call    row3_c      ; turn on row-3
          call    patt_c
          call    row4_c      ; turn on row-4
          call    patt_c
          call    row5_c      ; turn on row-5
          call    patt_c
          goto    dm_check
;
patt_a    call    col1_a
          call    wait
          call    col2_a
          call    wait
          call    col3_a
          call    wait
          call    col4_a
          call    wait
          call    col5_a
          call    wait
          call    col6_a
          call    wait
          call    col7_a
          call    wait
          call    clear
          return
patt_c    call    col1_c
          call    wait
          call    col2_c
          call    wait
          call    col3_c
          call    wait
          call    col4_c
          call    wait
          call    col5_c
          call    wait
          call    col6_c
          call    wait
          call    col7_c
          call    wait
          call    clear
          return
; row selection, c.a
row1_a    movlw    0x40
          movwf    porta
          return
row2_a    movlw    0x80
          movwf    porta
          return
row3_a    movlw    0x01
          movwf    porta
          return
row4_a    movlw    0x02
          movwf    porta
          return
row5_a    movlw    0x04
          movwf    porta
          return
; row selection, c.c
row1_c    movlw    0xbf
          movwf    porta
          return

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row2_c    movlw  0x7f
          movwf  porta
          return
row3_c    movlw  0xfe
          movwf  porta
          return
row4_c    movlw  0xfd
          movwf  porta
          return
row5_c    movlw  0xfb
          movwf  porta
          return
; column selection, c.a
col1_a    movlw  0x7e
          movwf  portb
          return
col2_a    movlw  0xbe
          movwf  portb
          return
col3_a    movlw  0xde
          movwf  portb
          return
col4_a    movlw  0xee
          movwf  portb
          return
col5_a    movlw  0xf6
          movwf  portb
          return
col6_a    movlw  0xfa
          movwf  portb
          return
col7_a    movlw  0xfc
          movwf  portb
          return
; column selection, c.c
col1_c    movlw  0x80
          movwf  portb
          return
col2_c    movlw  0x40
          movwf  portb
          return
col3_c    movlw  0x20
          movwf  portb
          return
col4_c    movlw  0x10
          movwf  portb
          return
col5_c    movlw  0x08
          movwf  portb
          return
col6_c    movlw  0x04
          movwf  portb
          return
col7_c    movlw  0x02
          movwf  portb
          return
;
; clear display
clear      clrff  porta      ; turn off all rows
          clrff  portb      ; turn off all columns
          call   wait       ; brief wait...
          return
; wait 0.20 seconds
wait       movlw  0xff
          movwf  count1
redo       movlw  0xff
          movwf  count0
around     decfsz count0,f
          goto   around
          decfsz count1,f
          goto   redo

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        return
; wait 1 second
wait5    call    wait
        call    wait
        call    wait
        call    wait
        call    wait
        return
end
```