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;*****
;
;   move2.asm
;   Robot car control program
;   with sw1,sw2
;
;   モーター二組による移動ロボット
;   モード切替SW
;
;*****
;
;   list          p=PIC16F84a
;   include       "P16F84a.INC"
;
;   __config__hs_osc & _wdt_off & _pwrte_on & _cp_off
;   errorlevel    -302      ;Eliminate bank warning
;
;***** Label Definition *****
ra0    equ    00h      ;RA0 bit
ra1    equ    01h      ;RA1 bit
ra2    equ    02h      ;RA2 bit
ra3    equ    03h      ;RA3 bit
ra4    equ    04h      ;RA4 bit
cnt500u equ    0ch      ;500usec counter Address
cnt1m  equ    0dh      ;1msec counter Address
cnt100m equ    0eh      ;100msec counter Address
cnt500m equ    0fh      ;500msec counter Address
cnt1s  equ    10h      ;1sec counter Address
cnt5s  equ    11h      ;5sec counter Address
;***** Pattern Data Definition *****
;   '1':OFF '0':ON
;
beep   equ    040h      ;beep
mae    equ    014h      ;move forward
usiro  equ    028h      ;move backward
right  equ    010h      ;right turn forward
left   equ    004h      ;left turn forward
right_f equ    010h      ;right turn forward
left_f  equ    004h      ;left turn forward
right_b equ    020h      ;right turn backward
left_b  equ    008h      ;left turn backward
rightbz equ    050h      ;right turn with buzzer
leftbz  equ    044h      ;left turn with buzzer
off     equ    000h      ;all off
;
;***** Pattern 2 *****
p20    equ    001111110b
p21    equ    0bdh
p22    equ    0dbh
p23    equ    0e7h
p24    equ    0dbh
p25    equ    0bdh
p26    equ    07eh
;
;***** Pattern 3 *****
p30    equ    0feh
p31    equ    0fdh
p32    equ    0fah
p33    equ    0f5h
p34    equ    0eah
p35    equ    0d5h
p36    equ    0aah
p37    equ    055h
p38    equ    0abh
p39    equ    057h
p3a    equ    0afh
p3b    equ    05fh
p3c    equ    0bfh
p3d    equ    07fh
;
;***** Program Start *****
org    0      ;Reset Vector
goto  init

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                                move_test.asm
    org     4                    ;Interrupt Vector
    goto    init

;***** Initial Process *****
    org     5
init    bsf     STATUS,RPO      ;Change to Bank1
        movlw  h'ff'           ;Set input mode data
        movwf  TRISA           ;Set PORTA to Input mode
        clrf   TRISB           ;Set PORTB to Output mode
        bcf    STATUS,RPO      ;Change to Bank0
        movlw  h'ff'           ;Set LED off data
        movwf  PORTB           ;Output data
        goto   ptn3

;***** Key Scan Process *****
kurikaesi    btfss  PORTA,ra2      ;RA2 ON ?
             call   ptn2           ;Yes. Call Pattern 2
             btfss  PORTA,ra3      ;RA3 ON ?
             call   ptn3           ;Yes. Call Pattern 3
             goto   kurikaesi      ;Retry

;***** Pattern 2 Output Subroutine *****
ptn2    movlw  off               ;motor all off
        movwf  PORTB             ;Output data
        movlw  beep              ;beep on
        movwf  PORTB             ;Output data
;
        movlw  mae               ;motor all on
        movwf  PORTB             ;Output data
        call   t1s               ;Wait 1sec
;
        btfss  PORTA,ra0         ;RA0 sensor r ON ?
        goto   b1
        btfss  PORTA,ra0

b1      btfss  PORTA,ra1
        goto   c1
        btfss  PORTA,ra0
        goto   d1
        btfss  PORTA,ra1
        goto   e1
        goto   ptn2
        return

c1      movlw  left_b             ;Set pattern data
        movwf  PORTB             ;Output data
        call   t1s               ;Wait 1sec
        call   t1s
        goto   ptn2

d1      movlw  right_b            ;Set pattern data
        movwf  PORTB             ;Output data
        call   t1s               ;Wait 1sec
        goto   ptn2

e1      movlw  left_b             ;Set pattern data
        movwf  PORTB             ;Output data
        call   t1s               ;Wait 1sec
        goto   ptn2

;***** Pattern 3 Output Subroutine *****
ptn3    movlw  beep              ;Set pattern data
        movwf  PORTB             ;Output data
        call   t1s               ;Wait 1sec
        movlw  off               ;Set pattern data
        movwf  PORTB             ;Output data
        call   t1s               ;Wait 1sec
        movlw  mae               ;Set pattern data

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movwf PORTB      ;Output data
call t5s         ;Wait 5sec
movlw usiro      ;Set pattern data
movwf PORTB      ;Output data
call t5s         ;Wait 5sec
movlw right      ;Set pattern data
movwf PORTB      ;Output data
call t5s         ;Wait 5sec
movlw off        ;Set pattern data
movwf PORTB      ;Output data
call t5s         ;Wait 5sec
movlw beep       ;Set pattern data
movwf PORTB      ;Output data
call t1s         ;Wait 1sec
movlw usiro      ;Set pattern data
movwf PORTB      ;Output data
call t5s         ;Wait 5sec
movlw left       ;Set pattern data
movwf PORTB      ;Output data
call t5s         ;Wait 5sec
movlw off        ;Set LED off data
movwf PORTB      ;Output data
call t1s         ;Wait 1sec
goto ptn3

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;*****
; Timer Subroutine for 10MHz clock
;*****

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;***** 1msec Timer Subroutine *****
t1m   movlw h'2'      ;(1) Set loop cnt1
      movwf cnt1m     ;(1) Save loop cnt1
tm1lp1 movlw d'249'   ;(1)*2 Set loop cnt2
      movwf cnt500u   ;(1)*2 Save loop cnt2
tm1lp2 nop           ;(1)*249*2 Time adjust
      nop             ;(1)*249*2 Time adjust
      decfsz cnt500u, f ;(1)*249*2 cnt500u-1=0 ?
      goto tm1lp2     ;(2)*248*2 No, continue
      decfsz cnt1m, f ;(1)*2 cnt1m-1=0 ?
      goto tm1lp1     ;(2) No. Continue
      return          ;(2) Yes. Cnt end
;Total 2501*0.4usec=1msec

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;***** 100msec Timer Subroutine *****
t100m movlw d'100'   ;Set loop counter
      movwf cnt100m ;Save loop counter
tm2lp  call t1m       ;1msec subroutine
      decfsz cnt100m, f ;cnt100m - 1 = 0 ?
      goto tm2lp     ;No. Continue
      return          ;Yes. Count end

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;***** 500msec Timer Subroutine *****
t500m  movlw d'5'    ;Set loop counter
      movwf cnt500m ;Save loop counter
tm3lp  call t100m    ;100msec subroutine
      decfsz cnt500m, f ;cnt500m - 1 = 0 ?
      goto tm3lp     ;No. Continue
      return          ;Yes. Count end

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;***** 1sec Timer Subroutine *****
t1s    movlw d'2'    ;Set loop counter
      movwf cnt1s   ;Save loop counter
tm4lp  call t500m    ;500msec subroutine
      decfsz cnt1s, f ;cnt1s - 1 = 0 ?
      goto tm4lp     ;No. Continue
      return          ;Yes. Count end

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;***** 5sec Timer Subroutine *****
t5s    movlw d'10'   ;Set loop counter
      movwf cnt1s   ;Save loop counter
tm6lp  call t500m    ;500msec subroutine
      decfsz cnt1s, f ;cnt1s - 1 = 0 ?
      goto tm6lp     ;No. Continue
      return          ;Yes. Count end

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move\_test.asm

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*****  
; END of LED flash control processing  
*****  
end
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