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;*****
robotest6.asm
Robot car control program
with sw1,sw2

障害物をよけて進むプログラム
モーター二組による移動ロボット
モード切替SWにより、プログラムモードと自己判断モードを切り替える
;*****

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
pr3    equ    0ch
pr2    equ    08h
pr1    equ    04h
pr0    equ    00h
;
;
;***** 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
;***** Program Start *****
org     0                ;Reset Vector
goto   init
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
;***** Key Scan Process *****
kurikaesi btfss  PORTA,ra0    ;RA0 ON ?
        goto  selfrun        ;Yes. Call Pattern 2
        btfss PORTA,ra1      ;RA1 ON ?
        call  ptn3          ;Yes. Call selfrun
        goto  kurikaesi     ;Retry
;*****

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robotest6y.asm

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; selfrun
;   マイクロスイッチにより障害物を検出し、回避して進むプログラム
;
;*****
selfrun
    movlw    mae                ;beep on
    movwf   PORTB              ;Output data
    call    t100m
    btfss   PORTA,ra2          ;
    call    ir_left            ;ra input data into sen_in
    btfss   PORTA,ra3          ;
    call    ir_righ            ;ra input data into sen_ingoto selfrun
    goto    selfrun
;
;*****
ir_left movlw    usiro
    movwf   PORTB
    call    t500m
    movlw   off
    movwf   PORTB
    movlw   rightbz
    movwf   PORTB
    call    t500m
    return
;*****
ir_righ movlw    usiro
    movwf   PORTB
    call    t500m
    movlw   off
    movwf   PORTB
    movlw   leftbz
    movwf   PORTB
    call    t500m
    return
;*****
wall    movlw    usiro
    movwf   PORTB
    call    t1s
    movlw   off
    movwf   PORTB
    movlw   rightbz
    movwf   PORTB
    call    t1s
    return
;*****
forward movlw    mae
    movwf   PORTB
    call    t1s
    movlw   beep
    movwf   PORTB
    call    t1s
    return
;*****
;***** 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
    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

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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
return

;*****
; Timer Subroutine for 10MHz clock
;*****
;***** 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
;
;***** 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
;
;***** 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
;
;***** 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
;
;***** 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
;
;*****
; END of processing
;*****
end

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