```
/* stepping motor controller */
/* PIC16F628A 使用　*/
/* 2014/07/24 by T.Inoue */

#include<htc.h>
#include<stdio.h>

__CONFIG(LVPDIS & BORDIS & UNPROTECT & MCLRDIS & PWRTEN & WDTDIS & HS);

#define _XTAL_FREQ 4000000     /* 4MHz */
#define JIKAN 3                /* msec */
#define n 25       /*bunkatsu*/

unsigned char g;

int      p[11][3]={{0,0,0},{-7,-10,0},{-25,-14,1},{-22,-24,0},{-28,-10,1},{-14,0,1},{-14,-13,0},{-18,-23,1},{-40,-29,0},{0,-19,1},{0,0,0}};

/*,{-18,-25,0},{-18,-38,1},{-28,-32,1},{-28,-42,1},{-6,-35,1},{-9,-28,1},{-5,-41,1}};*/
/*int            p[13][3]={{0,0,0},{30,0,1},{15,0,1},{15,-50,1},{40,-45,0},{35,-50,1},{55,-50,0},{45,-50,1},{50,-50,1},{50,0,1},{55,0,1},{45,0,1},{0,0,0}};
*/
/*int
p[18][2]={{10,43},{10,2},{15,22},{22,21},{23,2},{35,21},{34,0},{45,0},{40,21},{38,10},{53,20},{52,2},{60,2},{60,22},{78,4},{77,21},{67,0},{85,0}};
*/
unsigned char i,j;
int k,m,u,v;
int xe,ye,sx,sy,sz;

ioport();

timng();
stop_x();
stop_y();
clw_x();
uclw_x();
clw_y();
```

```
uclw_y();
run_px();
run_mx();
run_py();
run_my();
run_pxpy();
run_mxmy();
run_mxpy();
run_pxmy();
run_circle();

main(){

        ioport();

        RA0=1;  /*スタート  原点調整*/

        while(1){
                        uclw_x();
                        if(RA4 == 0) break;
                        }
        while(1){
                        uclw_y();
                        if(RA5 == 0) break;
                        }
        while(1){
                        clw_x();
                        if(RA4 == 0) break;
                        }
        while(1){
                        clw_y();
                        if(RA5 == 0) break;
                        }

        while(1){       /*作画 start*/
                        if(RA4 == 0) break;
                        }
        RA0=0;
```

```
g=1;
if(g==1){
        for(i=0;i<=10;i++){

                xe=p[i+1][0]-p[i][0];
                ye=p[i+1][1]-p[i][1];
                sx=xe*50/n;
                sy=ye*50/n;
                sz=p[i+1][2];
                if(sz == 0){
                        RA1=0;
                        for(j=80;j>0;j--){
                        __delay_ms(n);
                        }
                }
                if(sz == 1){
                        RA1=1;
                        for(j=80;j>0;j--){
                        __delay_ms(n);
                        }
                }
                if(ye == 0){
                        if(xe>0)run_px();
                        else if(xe<0)run_mx();
                        else stop_x();
                }
                if(xe == 0){
                        if(ye>0)run_py();
                        else if(ye<0)run_my();
                        else stop_y();
                }
                if(xe>0){
                        if (ye>0){
                        m=n*ye/xe;
                        run_pxpy();
                }
                else if(ye<0){
```

```
                                m=-n*ye/xe;
                                run_pxmy();
                                }
                        }
                        if(xe<0){
                                if(ye>0){
                                m=-n*ye/xe;
                                run_mxpy();
                                }
                        else if (ye<0){
                                m=n*ye/xe;
                                run_mxmy();
                                }
                        }
                }
        }
        RA1=0;
        while(1){       /*wait*/
                        if(RA4==0) break;
                        }
}

ioport(){

        TRISA = 0xBC;           /* b10111100 */
        TRISB = 0x00;           /* b00000000 */
}

timng(){
        __delay_ms(JIKAN);
}

stop_x(){                       /* stop x */
        RB0 = RB1 = RB2 = RB3 = 0;
}

stop_y(){                               /* stop y */
        RB4 = RB5 = RB6 = RB7 = 0;
```

```
}

clw_x(){                                /* x 正転    */

        timng();
        RB0=RB2=1;RB1=RB3=0;/*0x05*/
        timng();
        RB0=RB3=0;RB1=RB2=1;/*0x06*/
        timng();
        RB0=RB2=0;RB1=RB3=1;/*0x0A*/
        timng();
        RB0=RB3=1;RB1=RB2=0;/*0x09*/
}

uclw_x(){                               /* x 逆転*/

        timng();
        RB0=RB2=1;RB1=RB3=0;/*0x05*/
        timng();
        RB0=RB3=1;RB1=RB2=0;/*0x09*/
        timng();
        RB0=RB2=0;RB1=RB3=1;/*0x0A*/
        timng();
        RB0=RB3=0;RB1=RB2=1;/*0x06*/
}

clw_y(){                                /* y 正転    */

        timng();
        RB7=RB5=0;RB6=RB4=1;            /*0101*/
        timng();
        RB7=RB4=0;RB6=RB5=1;            /*0110*/
        timng();
        RB7=RB5=1;RB6=RB4=0;            /*1010*/
        timng();
        RB7=RB4=1;RB6=RB5=0;            /*1001*/
}
```

```
uclw_y(){                                        /*y 逆転*/

        timng();
        RB7=RB5=0;RB6=RB4=1;        /*0101*/
        timng();
        RB7=RB4=1;RB6=RB5=0;        /*1001*/
        timng();
        RB7=RB5=1;RB6=RB4=0;        /*1010*/
        timng();
        RB7=RB4=0;RB6=RB5=1;        /*0110*/
}

run_px(){
        for(k=sx;k>0;k--){
                for(u=n;u>0;u--) clw_x();
                stop_x();
        }
}

run_mx(){
        for(k=sx;k<0;k++){
                for(u=n;u>0;u--) uclw_x();
                stop_x();
        }
}

run_py(){
        for(k=sy;k>0;k--){
                for(u=n;u>=0;u--) clw_y();
                stop_y();
        }
}

run_my(){
        for(k=sy;k<0;k++){
                for(u=n;u>0;u--) uclw_y();
                stop_x();
        }
```

```
}

run_pxpy(){
        for(k=sx;k>0;k--){                      /*-x+y 正転*/
                for(u=n;u>0;u--) clw_x();
                stop_x();
                for(v=m;v>=0;v--) clw_y();
                stop_y();
        }
}

run_mxpy(){
        for(k=sx;k<0;k++){                      /*-x+y 正転*/
                for(u=n;u>0;u--) uclw_x();
                stop_x();
                for(v=m;v>=0;v--) clw_y();
                stop_y();
        }
}

run_pxmy(){
        for(k=sx;k>0;k--){                      /*+x-y */
                for(u=n;u>0;u--) clw_x();
                stop_x();
                for(v=m;v>0;v--) uclw_y();
                stop_y();
        }
}
run_mxmy(){
        for(k=sx;k<0;k++){                      /*-x 逆転-y */
                for(u=n;u>0;u--) uclw_x();
                stop_x();
                for(v=m;v>0;v--) uclw_y();
                stop_y();
        }
}
```