```c
#include <device.h>

// Video buffer gets its own SRAM to prevent bus contention.
// The user-facing buffer is in regular system RAM.
// This is set in the custom linker script (custom.ld).
#define Initial_Screen_Size_x 128
#define Initial_Screen_Size_y 96
//#define Target_size 13
#define Cursor_size 8
#define pbts_size 324
#define cx1 24
#define cy1 16
#define cx2 64
#define cy2 16
#define cx3 104
#define cy3 16
#define cx4 24
#define cy4 52
#define cx5 64
#define cy5 52
#define cx6 104
#define cy6 52
#define cx7 24
#define cy7 84
#define cx8 64
#define cy8 84
#define cx9 104
#define cy9 84
#define gslength 9

const int8 cx[9]={24,64,104,24,64,104,24,64,104};
const int8 cy[9]={16,16,16,52,52,52,84,84,84};

const int8 start_display[96][128] = {0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
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, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0};

const int8 pbts_x[324]={20, 21, 22, 23, 24, 25, 21, 26, 21, 26, 21, 26, 28, 29
, 30, 32, 33, 37, 38, 39, 40, 41, 45, 46, 47, 48, 49, 53, 54, 55, 56, 57, 21, 
22, 23, 24, 25, 30, 31, 34, 36,
42, 44, 50, 52, 58, 21, 30, 36, 37, 38, 39, 40, 41, 42, 45, 46, 47, 53, 54, 55
, 21, 30, 36, 48, 49, 56, 57, 21, 30, 36, 42, 44, 50, 52, 58, 20, 21, 22, 23, 
28, 29, 30, 31, 32, 37, 38, 39, 40, 41, 45, 46, 47, 48, 49, 53, 54, 55, 56, 57
, 20, 21, 22, 23, 24, 25, 21, 26, 38, 46, 78, 21, 26, 38, 46, 78, 21, 26, 28, 
29, 32, 33, 37, 38, 39, 40, 45, 46, 47, 48, 53, 54, 55, 56, 57, 60, 61, 63, 64
, 77, 78, 79, 80, 85, 86, 87, 88, 89, 21, 22, 23, 24, 25, 29, 33, 38, 46, 52, 
58, 61, 62, 65, 78, 84, 90, 21, 26, 29, 33, 38, 46, 52, 58, 61, 65, 78, 84, 90
, 21, 26, 29, 33, 38, 46, 52, 58, 61, 65, 78, 84, 90, 21, 26, 29, 32, 33, 38, 
41, 46, 49, 52, 58, 61, 65, 78, 81,
```

```
84, 90, 20, 21, 22, 23, 24, 25, 30, 31, 33, 34, 39, 40, 47, 48, 53, 54, 55, 56
, 57, 60, 61, 62, 64, 65, 66, 79, 80, 85, 86, 87, 88, 89, 21, 22, 23, 24, 25,
20, 26, 30, 54, 20, 30, 54, 20, 29, 30, 31, 32, 37, 38, 39, 40, 44, 45, 46, 48
, 49, 53, 54, 55, 56, 21, 22, 23, 24, 25, 30, 41, 46, 47, 50, 54, 26, 30, 37,
38, 39, 40, 41, 46, 54, 26, 30, 36, 41, 46, 54, 20, 26, 30, 33, 36, 41, 46, 54
, 57, 21, 22, 23, 24, 25, 31, 32, 37, 38, 39, 40, 42, 44, 45, 46, 47, 48, 55,
56};
const int8 pbts_y[324]={33, 33, 33, 33, 33, 33, 34, 34, 35, 35, 36, 36, 36, 36
, 36, 36, 36, 36, 36, 36, 36, 36, 36, 36, 36, 36, 36, 36, 36, 36, 36, 37,
37, 37, 37, 37, 37, 37, 37, 37,
37, 37, 37, 37, 37, 38, 38, 38, 38, 38, 38, 38, 38, 38, 38, 38, 38, 38, 38, 38
, 39, 39, 39, 39, 39, 39, 39, 40, 40, 40, 40, 40, 40, 40, 40, 40, 41, 41, 41, 41,
41, 41, 41, 41, 41, 41, 41, 41, 41, 41, 41, 41, 41, 41, 41, 41, 41, 41, 41, 41
, 46, 46, 46, 46, 46, 46, 47, 47, 47, 47, 47, 48, 48, 48, 48, 48, 49, 49, 49,
49, 49, 49, 49, 49, 49, 49, 49, 49, 49, 49, 49, 49, 49, 49, 49, 49, 49, 49, 49
, 49, 49, 49, 49, 49, 49, 49, 49, 49, 50, 50, 50, 50, 50, 50, 50, 50, 50, 50,
50, 50, 50, 50, 50, 50, 50, 51, 51, 51, 51, 51, 51, 51, 51, 51, 51, 51, 51, 51
, 52, 52, 52, 52, 52, 52, 52, 52, 52, 52, 52, 52, 52, 53, 53, 53, 53, 53, 53,
53, 53, 53, 53, 53, 53, 53, 53, 53,
53, 53, 54, 54, 54, 54, 54, 54, 54, 54, 54, 54, 54, 54, 54, 54, 54, 54, 54, 54
, 54, 54, 54, 54, 54, 54, 54, 54, 54, 54, 54, 54, 54, 54, 59, 59, 59, 59, 59,
60, 60, 60, 60, 61, 61, 61, 62, 62, 62, 62, 62, 62, 62, 62, 62, 62, 62, 62, 62
, 62, 62, 62, 62, 62, 63, 63, 63, 63, 63, 63, 63, 63, 63, 63, 63, 64, 64, 64,
64, 64, 64, 64, 64, 64, 64, 65, 65, 65, 65, 65, 65, 66, 66, 66, 66, 66, 66, 66, 66
, 66, 67, 67, 67, 67, 67, 67, 67, 67, 67, 67, 67, 67, 67, 67, 67, 67, 67, 67,
67};

const int8 x_x[9]={0,1,-1,1,-1,2,-2,2,-2};
const int8 x_y[9]={0,1,1,-1,-1,2,2,-2,-2};
const int8 circx[8]={0,1,2,1,0,-1,-2,-1};
const int8 circy[8]={-2,-1,0,1,2,1,0,-1};

//const int8 targetx[Target_size] = {0,1,2,3,2,1,0,-1,-2,-3,-2,-1,0};
//const int8 targety[Target_size] = {-2,-2,-1,0,1,2,2,2,1,0,-1,-2,0};

const int8 cursorx[Cursor_size] = {1,2,0,0,-1,-2,0,0};
const int8 cursory[Cursor_size] = {0,0,1,2,0,0,-1,-2};

uint8 buf[96][128], vbuf[96][128] __attribute__ ((section(".vram")));
uint8 cursor_x_velo=0;
uint8 cursor_y_velo=0;
uint8 cursor_x_pos=64;
uint8 cursor_y_pos=48;
uint8 bpress = 0;
uint16 t_counter=5;
uint8 turn = 0; // 0 is computer, 1 is player
uint8 winner = 0; // 0 is computer, 1 is player
char game_state[gslength]= {'-','-','-','-','-','-','-','-','-'};

void decode(char[4]);
void startscreen();
void initialscreen();
```

```
void pcursor();
void ptargets();
void plevel();
void boundarycheck();
void titlescreen();
void pgrid();
void c_gamestate();
void check_win();
void print_syms();

// Now we set up the DMA to copy pixels from vbuf to the screen.
// For timing, we rely on the fact that it takes the DMA exactly
// 8 clocks to move each byte. After each line the DMA is updated
// to point to the next line in vbuf.
uint8 dma_chan, dma_td;
volatile int flag = 1;

CY_ISR(newline) {
    uint16 line = 805 - VERT_ReadCounter();
    if (line % 8 == 0) {
        if (line < 768) {
            CY_SET_REG16(CY_DMA_TDMEM_STRUCT_PTR[dma_td].TD1,
                         LO16((uint32) vbuf[line / 8]));
        } else if (line == 768 && flag) {  // refresh the buffer during vsync
            CyDmaChDisable(dma_chan);
            if (flag) {
                memcpy(*vbuf, *buf, 96 * 128);
                flag = 0;
            }
            CyDmaChEnable(dma_chan, 1);
        }
    }
}

CY_ISR(isr_1){
   char response[4];
    int i=0;
    while(i<3){
        if (UART_1_GetRxBufferSize() > 0) {
            uint8 c = UART_1_GetChar();
            response[i]= c;
            i++;
        }
    }
    decode(response);
    cursor_x_pos=cursor_x_pos+cursor_x_velo;
    cursor_y_pos=cursor_y_pos+cursor_y_velo;
    Timer_1_STATUS;
    //Timer _C
    //Reset Interrupt

}
```

```
inline void update() {
    flag = 1;
    while (flag);
}

void main() {
    // Initialize the DMA.
    dma_td = CyDmaTdAllocate();
    dma_chan = DMA_DmaInitialize(1, 0, HI16(CYDEV_SRAM_BASE), HI16(
CYDEV_PERIPH_BASE));
    CyDmaTdSetConfiguration(dma_td, 128, dma_td, DMA__TD_TERMOUT_EN |
TD_INC_SRC_ADR);
    CyDmaTdSetAddress(dma_td, 0, LO16((uint32) PIXEL_Control_PTR));
    CyDmaChSetInitialTd(dma_chan, dma_td);
    CyDmaChEnable(dma_chan, 1);

    // Start all of the timing counters and the UART.
    HORIZ_Start();
    VERT_Start();
    HSYNC_Start();
    VSYNC_Start();
    NEWLINE_StartEx(newline);
    ISR_1_StartEx(isr_1);
    UART_1_Init();
    UART_1_Start();
    Timer_1_Start();

    //Timer_1_Start
    CyGlobalIntEnable;

    ISR_1_SetPriority(1);
    NEWLINE_SetPriority(0);

    initialscreen();
    //titlescreen();
    //while (bpress !=1){
    //}
    //CyDelay(1000);
    //startscreen();
    //while (bpress!=1){
    //}
    for(;;){
        memcpy(*buf, *start_display, 96 * 128);
        pgrid();
        c_gamestate(); //get response from player, or play update game_state
        check_win();    // iterate through game_state, look for potential wins
        print_syms();   // update display with symbols
        pcursor();
        update();

    }
```

```
}

void initialscreen(){
    memcpy(*buf, *start_display, 96 * 128);
    update();
}
void startscreen(){
    memcpy(*buf, *start_display, 96 * 128);
    int i;
    for(i = 0; i<pbts_size;i++){
        buf[pbts_y[i]][pbts_x[i]]=0xff;
    }
    update();
}

void pgrid(){
    int i;
    for(i = 0; i<Initial_Screen_Size_y;i++){
        buf[i][43]=0xff;
        buf[i][44]=0xff;
        buf[i][45]=0xff;
        buf[i][83]=0xff;
        buf[i][84]=0xff;
        buf[i][85]=0xff;
    }
    for(i = 0; i<Initial_Screen_Size_x;i++){
        buf[31][i]=0xff;
        buf[32][i]=0xff;
        buf[33][i]=0xff;
        buf[63][i]=0xff;
        buf[64][i]=0xff;
        buf[65][i]=0xff;
    }
}
void c_gamestate(){
    if(turn==0){        //Computer Turn
        int i;
        for(i=0;i<9;i++){
            if(game_state[i] != 'X' && game_state[i] != 'O'){
                game_state[i]='X';
                turn = 1;
                break;
            }
        }
    }
    else if(turn ==1){      //Player Turn
        if(bpress==1){
            if(cursor_x_pos<=44 && cursor_y_pos<=32){
                if(game_state[0] != 'X' && game_state[0] != 'O'){
                game_state[0]='O';
                turn =0;}
```

```
            }
            else if((cursor_x_pos>44 &&cursor_x_pos<=84)&& cursor_y_pos<=32){
                if(game_state[1] != 'X' && game_state[1] != 'O'){
                game_state[1]='O';
                turn =0;
                }
            }
            else if(cursor_x_pos>84 &&cursor_y_pos<=32){
                if(game_state[2] != 'X' && game_state[2] != 'O'){
                game_state[2]='O';
                turn =0;
                }
            }
            else if(cursor_x_pos<=44 &&(cursor_y_pos>32 && cursor_y_pos<=64)){
                if(game_state[3] != 'X' && game_state[3] != 'O'){
                game_state[3]='O';
                turn =0;}
            }
            else if((cursor_x_pos>44 && cursor_x_pos<=84)&&(cursor_y_pos>32 ↵
&& cursor_y_pos<=64)){
                if(game_state[4] != 'X' && game_state[4] != 'O'){
                game_state[4]='O';
                turn =0;}
            }
            else if(cursor_x_pos>84 &&(cursor_y_pos>32 && cursor_y_pos<=64)){
                if(game_state[5] != 'X' && game_state[5] != 'O'){
                game_state[5]='O';
                turn =0;}
            }
            else if(cursor_x_pos<=44&&cursor_y_pos<64){
                if(game_state[6] != 'X' && game_state[6] != 'O'){
                game_state[6]='O';
                turn =0;}
            }
            else if((cursor_x_pos>44 && cursor_x_pos<=84)&&cursor_y_pos<64){
                if(game_state[7] != 'X' && game_state[7] != 'O'){
                game_state[7]='O';
                turn =0;}
            }
            if(cursor_x_pos>84&&cursor_y_pos<64){
                if(game_state[8] != 'X' && game_state[8] != 'O'){
                game_state[8]='O';
                turn =0;}
            }
        }
    }
}

void check_win(){
    if (game_state[0]=='X' && game_state[1]=='X' && game_state[2]=='X'){
        turn=2;
        winner = 0;
```

```
}
else if (game_state[3]=='X' && game_state[4]=='X' && game_state[5]=='X'){
    turn=2;
    winner = 0;
}
else if (game_state[6]=='X' && game_state[7]=='X' && game_state[8]=='X'){
    turn=2;
    winner = 0;
}
else if (game_state[0]=='X' && game_state[3]=='X' && game_state[6]=='X'){
    turn=2;
    winner = 0;
}
else if (game_state[1]=='X' && game_state[4]=='X' && game_state[7]=='X'){
    turn=2;
    winner = 0;
}
else if (game_state[2]=='X' && game_state[5]=='X' && game_state[8]=='X'){
    turn=2;
    winner = 0;
}
else if (game_state[0]=='X' && game_state[4]=='X' && game_state[8]=='X'){
    turn=2;
    winner = 0;
}
else if (game_state[2]=='X' && game_state[4]=='X' && game_state[6]=='X'){
    turn=2;
    winner = 0;
}


else if (game_state[0]=='O' && game_state[1]=='O' && game_state[2]=='O'){
    turn=2;
    winner = 1;
}
else if (game_state[3]=='O' && game_state[4]=='O' && game_state[5]=='O'){
    turn=2;
    winner = 1;
}
else if (game_state[6]=='O' && game_state[7]=='O' && game_state[8]=='O'){
    turn=2;
    winner = 1;
}
else if (game_state[0]=='O' && game_state[3]=='O' && game_state[6]=='O'){
    turn=2;
    winner = 1;
}
else if (game_state[1]=='O' && game_state[4]=='O' && game_state[7]=='O'){
    turn=2;
    winner = 1;
}
else if (game_state[2]=='O' && game_state[5]=='O' && game_state[8]=='O'){
```

```
        turn=2;
        winner = 1;
    }
    else if (game_state[0]=='O' && game_state[4]=='O' && game_state[8]=='O'){
        turn=2;
        winner = 1;
    }
    else if (game_state[2]=='O' && game_state[4]=='O' && game_state[6]=='O'){
        turn=2;
        winner = 1;
    }
}

void print_syms(){
    int i;
    for(i=0; i<gslength;i++){
        if (game_state[i]=='X'){
            int j;
            for (j=0;j<9;j++){
                buf[cy[i]+x_y[j]][cx[i]+x_x[j]]=255;
            }
        }
        else if (game_state[i]=='O'){
            int k;
            for (k=0;k<9;k++){
                buf[cy[i]+circy[k]][cx[i]+circx[k]]=255;
            }
        }
    }
}
/*
void titlescreen(){
    memcpy(*buf, *start_display, 96 * 128);
    int i;
    for(i = 0; i<titlescreen1size;i++){
        buf[titlescreenc1y[i]][titlescreenc1x[i]]=0x39;
    }
    for(i = 0; i<titlescreen2size;i++){
        buf[titlescreenc2y[i]][titlescreenc2x[i]]=0x0C;
    }
    for(i = 0; i<titlescreen3size;i++){
        buf[titlescreenc3y[i]][titlescreenc3x[i]]=0x03;
    }
    update();
}

void ptargets(){
    int i;
    for (i = 0; i < Target_size;i++){
        if(r_targets[0]=='O'){
        buf[target1_y_pos+targety[i]][target1_x_pos+targetx[i]]=0x03;
        }
```

```
        if(r_targets[1]=='O'){
        buf[target2_y_pos+targety[i]][target2_x_pos+targetx[i]]=0x03;
        }
        if(r_targets[2]=='O'){
        buf[target3_y_pos+targety[i]][target3_x_pos+targetx[i]]=0x03;
        }
    }
}
void calc_t_pos(){
    if (t_counter ==0){
        target1_x_pos = target1_x_pos+target1_velo;
        target1_y_pos = target1_y_pos+target1_velo;
        target2_x_pos = target2_x_pos+target2_velo;
        target2_y_pos = target2_y_pos+target2_velo;
        target3_x_pos = target3_x_pos+target3_velo;
        target3_y_pos = target3_y_pos+target3_velo;
        t_counter=5;
    }
    else{
        t_counter = t_counter-1;
    }
}
*/




    /*
        if(explode_s==3){
            explode_s=2;
            int i;
            for(i=0;i<explode_size;i++){
            buf[target1_y_pos+explode1_y[i]][target1_x_pos+explode1_x[i]] = ↵
0x07;
            }
        }
        else if(explode_s==2){
            int i;
            explode_s=1;
            for(i=0;i<explode_size;i++){
            buf[target1_y_pos+explode1_y[i]][target1_x_pos+explode1_x[i]] = ↵
0x07;
            buf[target1_y_pos+explode1_y[i]][target1_x_pos+explode2_x[i]] = ↵
0x0F;
            }
        }
        else if(explode_s==1){
            int i;
            explode_s=0;
            for(i=0;i<explode_size;i++){
            buf[target1_y_pos+explode1_y[i]][target1_x_pos+explode1_x[i]] = ↵
```

```
0x07;
            }
        }
    }
    else if(r_targets[1]=='X'){
        if(explode_s==3){
            explode_s=2;
            int i;
            for(i=0;i<explode_size;i++){
            buf[target2_y_pos+explode1_y[i]][target2_x_pos+explode1_x[i]] = ↵
0x07;
            }
        }
        else if(explode_s==2){
            int i;
            explode_s=1;
            for(i=0;i<explode_size;i++){
            buf[target2_y_pos+explode1_y[i]][target2_x_pos+explode1_x[i]] = ↵
0x07;
            buf[target2_y_pos+explode1_y[i]][target2_x_pos+explode2_x[i]] = ↵
0x0F;
            }
        }
        else if(explode_s==1){
            int i;
            explode_s=0;
            for(i=0;i<explode_size;i++){
            buf[target2_y_pos+explode1_y[i]][target2_x_pos+explode1_x[i]] = ↵
0x07;
            }
        }
    }
    else if(r_targets[2]=='X'){
        if(explode_s==3){
            explode_s=2;
            int i;
            for(i=0;i<explode_size;i++){
            buf[target3_y_pos+explode1_y[i]][target3_x_pos+explode1_x[i]] = ↵
0x07;
            }
        }
        else if(explode_s==2){
            int i;
            explode_s=1;
            for(i=0;i<explode_size;i++){
            buf[target3_y_pos+explode1_y[i]][target3_x_pos+explode1_x[i]] = ↵
0x07;
            buf[target3_y_pos+explode1_y[i]][target3_x_pos+explode2_x[i]] = ↵
0x0F;
            }
        }
        else if(explode_s==1){
```

```
            int i;
            explode_s=0;
            for(i=0;i<explode_size;i++){
            buf[target3_y_pos+explode1_y[i]][target3_x_pos+explode1_x[i]] = 0x07;
            }
        }
    }
}
*/



void pcursor(){
    //cursor_x_pos
    //cursor_y_pos
    int i;
    for (i = 0; i < Cursor_size;i++){
        buf[cursor_y_pos+cursory[i]][cursor_x_pos+cursorx[i]]= 255;
    }
}

void decode(char *hello){
     int k;
     for(k=0;k<3;k++){
        switch(hello[k]){
            case 'A':
                cursor_x_velo = 2;
                break;
            case 'B':
                cursor_x_velo = 2;
                break;
            case 'C':
                cursor_x_velo = 1;
                break;
            case 'D':
                cursor_x_velo = 1;
                break;
            case 'E':
                cursor_x_velo = 0;
                break;
            case 'F':
                cursor_x_velo = -1;
                break;
            case 'G':
                cursor_x_velo = -1;
                break;
            case 'H':
                cursor_x_velo = -2;
                break;
            case 'I':
                cursor_x_velo = -2;
```

```
            break;
        case 'J':
            cursor_y_velo = 2;
            break;
        case 'K':
            cursor_y_velo = 2;
            break;
        case 'L':
            cursor_y_velo = 1;
            break;
        case 'M':
            cursor_y_velo = 1;
            break;
        case 'N':
            cursor_y_velo = 0;
            break;
        case 'O':
            cursor_y_velo = -1;
            break;
        case 'P':
            cursor_y_velo = -1;
            break;
        case 'Q':
            cursor_y_velo = -2;
            break;
        case 'R':
            cursor_y_velo = -2;
            break;
        case 'S':
            bpress = 1;
            break;
        case 'T':
            bpress = 1;
            break;
        case 'U':
            bpress = 1;
            break;
        case 'V':
            bpress = 1;
            break;
        case 'W':
            bpress = 0;
            break;
    }
  }
}


  /*
  if (cursor_x_pos >132){
      cursor_x_pos = 4;
  }
```

```
    if (cursor_x_pos <4){
        cursor_x_pos = 132;
    }
    if (cursor_y_pos >96){
        cursor_y_pos = 0;
    }
    if (cursor_y_pos <0){
        cursor_y_pos = 96;
    }*/

   /*
    int x = 0, y = 0, i, j;
    // Mode definition:
    // bit 7 may have an arbitrary value.
    // if bits 2-6 are zero, draw raster images at a resolution determined by ↵
bits 0-1.
    uint8 mode = 0;
    for(;;) {
        CyDelayUs(100);  // can't check UART too quickly or bus saturation ↵
causes graphics blips
        if (!(UART_ReadRxStatus() & UART_RX_STS_FIFO_NOTEMPTY)) continue;
        uint8 c = UART_GetByte();
        if (c & 0x80) {
            mode = c;
            x = y = 0;
        } else {
            int step = ((mode & 1) ? 1 : 2) * ((mode & 2) ? 1 : 4);
            for (i = 0; i < step; ++i) {
                for (j = 0; j < step; ++j) {
                    buf[y + i][x + j] = c & 0x3f;
                }
            }
            x += step;
            if (x == 128) {
                x = 0;
                y += step;
                if (y == 96) {
                    y = 0;
                    update();
                }
            }
        }
    }
}
*/
```