```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 Intial_Screen_Size_y 96
//#define Target_size 13
#define Target_size 8
#define Cursor_size 8
#define pbts_size 324
#define range 25
#define lvl1_size 9
#define lvl2_size 10
#define lvl3_size 14
#define explode_size 4
#define titlescreen1size 549
#define titlescreen2size 141
#define titlescreen3size 144

const int8 start_display[96][128] = {0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0
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const int8 g_range_x[range]={-2,-1,0,1,2,-2,-1,0,1,2,-2,-1,0,1,2,-2,-1,0,1,2,
-2,-1,0,1,2};
const int8 g_range_y[range]={-2,-2,-2,-2,-2,-1,-1,-1,-1,-1,0,0,0,0,0,1,1,1,1,1
,2,2,2,2,2};

const int8 explode1_x[explode_size]={1,1,-1,-1};
const int8 explode1_y[explode_size]={-1,1,1,-1};

const int8 explode2_x[explode_size]={2,2,-2,-2};
const int8 explode2_y[explode_size]={-2,2,2,-2};

const int8 lvl1x[lvl1_size]={7,8,8,8,8,8,6,7,9};
const int8 lvl1y[lvl1_size]={4,4,5,6,7,8,8,8,8};
const int8 lvl2x[lvl2_size]={7,8,9,6,8,7,6,7,8,9};
const int8 lvl2y[lvl2_size]={4,4,5,5,6,7,8,8,8,8};
const int8 lvl3x[lvl3_size]={6,7,8,9,9,9,6,7,8,9,6,7,8,9};
const int8 lvl3y[lvl3_size]={4,4,4,4,5,7,6,6,6,6,8,8,8,8};

//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 targetx[Target_size] = {0,1,2,1,0,-1,-2,-1};
const int8 targety[Target_size] = {-2,-1,0,1,2,1,0,-1};
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 target1_x_pos=96;
uint8 target1_y_pos=48;
uint8 target2_x_pos=0;
uint8 target2_y_pos=48;
uint8 target3_x_pos=0;
uint8 target3_y_pos=48;
uint8 target1_velo=1;
uint8 target2_velo=1;
uint8 target3_velo=1;
uint8 cursor_x_velo=0;
uint8 cursor_y_velo=0;
uint8 cursor_x_pos=64;
uint8 cursor_y_pos=48;
uint8 bpress = 0;
uint8 cur_level = 1;
uint16 t_counter=5;
```

```c
uint8 explode_counter=3;
uint8 explode_s=3;
char r_targets[3]= {'O','O','O'};

void decode(char[4]);
void startscreen();
void initialscreen();
void pcursor();
void ptargets();
void plevel();
void calc_t_pos();
void hit_target();
void game_state();
void pexplode();
void boundarycheck();
void titlescreen();

// 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);
        plevel();
        calc_t_pos();
        boundarycheck();
        hit_target();
        ptargets();
        pcursor();
        game_state();
        pexplode();
        update();
    }

    //BASIC OUTPUT OF ORANGE COLOR ON SCREEN
    /*
        int x = 0, y = 0;
    for(;;) {
        buf[y][x] = 0x07; // set the RGB value at x, y pixel in buffer
        x += 1;
        if (x == 128){
            x = 0;
            y += 1;
            if (y == 96){
                y = 0;
                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 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;
    }
}

void hit_target(){
    //cursor_x_pos, cursor_y_pos
    //target1_y_pos, target1_x_pos
    int i=0;
    for(i=0; i<range; i++){
        if(cursor_x_pos+g_range_x[i]==target1_x_pos && cursor_y_pos+g_range_y[↩
i]==target1_y_pos){
            if(bpress==1){
                r_targets[0]='X';
                explode_s=3;
                break;
            }
        }
        else if(cursor_x_pos+g_range_x[i]==target2_x_pos && cursor_y_pos↩
+g_range_y[i]==target2_y_pos){
            if(bpress==1){
                r_targets[1]='X';
                explode_s=3;
                break;
            }
        }
        else if(cursor_x_pos+g_range_x[i]==target3_x_pos && cursor_y_pos↩
+g_range_y[i]==target3_y_pos){
            if(bpress==1){
                r_targets[2]='X';
                explode_s=3;
                break;
            }
        }
    }
}

void pexplode(){
    if(r_targets[0]=='X'){
        if (explode_s!=0){
            int i;
            for(i=0;i<explode_size;i++){
            buf[target1_y_pos+explode1_y[i]][target1_x_pos+explode1_x[i]] = ↩
0x0F;
            buf[target1_y_pos+explode2_y[i]][target1_x_pos+explode2_x[i]] = ↩
0x0F;
            }
        explode_s=explode_s-1;
        }
    }
    if(r_targets[1]=='X'){
        if (explode_s!=0){
            int i;
            for(i=0;i<explode_size;i++){
            buf[target2_y_pos+explode1_y[i]][target2_x_pos+explode1_x[i]] = ↩
0x0F;
            buf[target2_y_pos+explode2_y[i]][target2_x_pos+explode2_x[i]] = ↩
0x0F;
            }
        explode_s=explode_s-1;
        }
    }
    if(r_targets[2]=='X'){
        if (explode_s!=0){
            int i;
            for(i=0;i<explode_size;i++){
            buf[target3_y_pos+explode1_y[i]][target3_x_pos+explode1_x[i]] = ↩
0x0F;
            buf[target3_y_pos+explode2_y[i]][target3_x_pos+explode2_x[i]] = ↩
0x0F;
            }
        explode_s=explode_s-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 game_state(){
    if (r_targets[0]=='X'&&r_targets[1]=='X'&&r_targets[2]=='X'){
        cur_level=cur_level+1;
        r_targets[0]='O';
        r_targets[1]='O';
        r_targets[2]='O';
    }
    if (cur_level==4){
        //gameover
        cur_level=0;
    }
}


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 plevel(){
    if(cur_level==1){
        target1_velo=1;
        target2_velo=2;
        target3_velo=1;
        int i;
        for (i = 0; i < lvl1_size;i++){
            buf[lvl1y[i]][lvl1x[i]]=255;
        }
    }
    if(cur_level==2){
        target1_velo=-1;
        target2_velo=-2;
        target3_velo=1;
        int i;
        for (i = 0; i < lvl2_size;i++){
            buf[lvl2y[i]][lvl2x[i]]=255;
        }
    }
    if(cur_level==3){
        target1_velo=3;
        target2_velo=-2;
        target3_velo=-1;
        int i;
        for (i = 0; i < lvl3_size;i++){
            buf[lvl3y[i]][lvl3x[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;
        }
    }
}

void boundarycheck(){
    if (target1_x_pos >=132){
        target1_x_pos = 4;
    }
    else if (target1_x_pos <4){
        target1_x_pos = 132;
    }
    else if (target1_y_pos >=96){
        target1_y_pos = 0;
    }
    else if (target1_y_pos <0){
        target1_y_pos = 96;
    }
    else if (target2_x_pos >=132){
        target2_x_pos = 4;
    }
    else if (target2_x_pos <4){
        target2_x_pos = 132;
    }
    else if (target2_y_pos >=96){
        target2_y_pos = 0;
    }
    else if (target2_y_pos <0){
        target2_y_pos = 96;
    }
    else if (target3_x_pos >=132){
        target3_x_pos = 4;
    }
    else if (target3_x_pos <4){
        target3_x_pos = 132;
    }
    else if (target3_y_pos >=96){
        target3_y_pos = 0;
    }
    else if (target3_y_pos <0){
        target3_y_pos = 96;
    }
    /*
    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();
                }
            }
        }
    }
}
*/
```