BOMBERMAN

CSEE 4840 Embedded System Final Report

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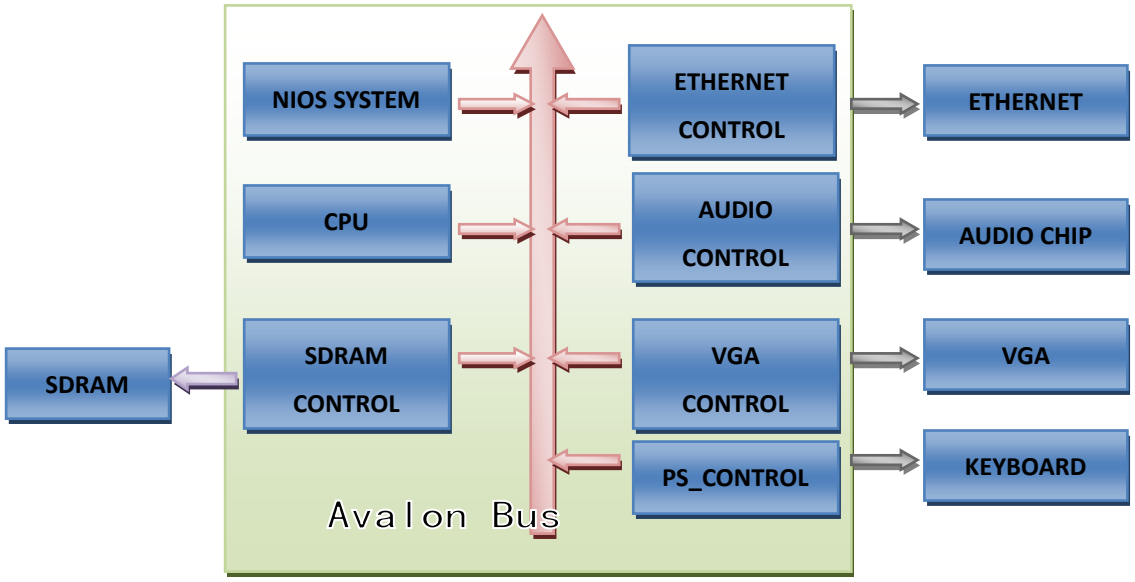
1. Introduction

In this project, we intend to implement a popular game called BOMBERMAN. It will be a game of multiple players. Each player plays the game in separate machine and communicates with others through network. The general goal for game player is to kill each other by strategically placing bombs which will explode after predefined period. Bombs in the game have predefined effective hurt range, within which any player will be killed. After several games, we will decide the winner who kills the most people.

2. System Architecture

The following is the design block of our project. It is composed of CPU, SDRAM CONTROL, SDRAM CONTROL, ETHERNET CONTROL, AUDIO CONTROL, VGA CONTROL and PS2 CONROL. In our project we focus on the VGA CONTROL, AUDIO CONTROL and software development.



3. Software Development

In the part we will describe how we implement our project in software and hardware. Software and hardware have identical control table that is used to control character and render the scene on LCD.

Software is mainly responsible for characters controlling, event processing and network communication.

Players will use arrow keys on keyboard to move Bomber men. For each movement software will check whether the Bomber men can go ahead or not through checking control table. After checking we can decide how to change the position of characters. Software also deals with the sounds play. We wrote some sound functions, each function will play particular sound.

There are several events we have to address in the game. Firstly, we have to address the event of bomb. For synchronization, we build timer that on the DE2 board for bombs' explosion. Each player's timer will start to count when the player one press the "enter", and game will start. We players place bomb, the bomb will be added to a linked-list. We will continue to check the whole linked-list to explode a bomb. Each bomb will record the explosion time and once the current time is bigger than explosion time. However, the explosion of bombs is can ignite others bombs' explosion, so we use the recursive function here

Secondly, we have to deal with the fire. Fire should exist for a short time that once player get close to it he will die. We use the same technique as bomb. Once fire time is bigger than current time it will disappear.

Besides, we need to detect the death of players and end state of game. Here we check the players' position, when the players' position is overlap with the fire, they will die. Once all players die or there is only one player left, game is over. Software will send signals to the hardware to late it know the game stage and the states of players.

Finally, we need to implement the network communication part. This is the most difficult part in the software development. We will discuss it in the Network part. The following we will start to describe the hardware design.

4. VGA CONTROLLER

a. Game Graphics

In the lab3, we have learned to implement a video display. We were able to store our character sets and graphics in the RAM.

We generate out graphics in an array representing 32x32 pixels. Each 32x32 pixels array on the screen will be represented by three strings of 10 values. Each group of ten values will represent a mapping in one color. The first term in the string will represent the value for the color of the following pixel map. We will then proceed to read the second string of values to overlap the same 32x32 pixels space on our screen. The second string will represent the second color, with no pixels overlapping the first layer. This approach allows us to create 32x32 pixels array with two colors or more. For convenience, the game engine will read 6 bits with 64 values at a time.

For title graphic, we use 200x200 pixels space to form a logo, and 48x128 to form the selection of numbers of players.

b. Graphics

We make the Bomber Man as a 32x32 pixel character. The most important thing is that Bomber Man will walk on four different directions- right, left, up, and down. So sprites should be different for Bomber Man's movement. We use 5 colors to build a Bomber Man, thus we use 5 patterns to form a character. Each of the patterns has different color. In addition, when the Bomber Man moves to left or right, the pattern will change to the pattern which the Bomber Man is left or right. When the Bomber Man is going up or down, the pattern will change to Bomber Man's back or face. The maximum numbers of the players is 4. They use the same pattern but different colors.

We write data to different addresses in order to give the x and y coordinates of different players or put the tiles in the corresponding direction. The coordinates between tiles and player are different. It is because that each tile is filled with 32x32 so does the players. However, in order to let the player moves normally, we need to give the player's coordinates just like lab 3's rectangle. We divide the 640 and 480 by 32, we get 20 and 15. Each tile is 32x32, so we can form our map by giving the tile coordinates between (0,0) and (20,15). We use control array to indicate the different tiles.

i.e.:"000000" means background and "111111" means boundary.

Below is the indication of each address:

Address	Indication
0	X of player1
1	Y of player 1
2	X of player 2
3	Y of player 2
4	X of player 3
5	Y of player 3
6	X of player 4
7	Y of player 4
8	Empty
9	Tile
10	Time
11	States of player1 (Dead or Alive)
12	States of player2 (Dead or Alive)
13	States of player3 (Dead or Alive)
14	States of player4 (Dead or Alive)

We read 16 bit of data once. We read x of player then y of player because the value of x or y of player will exceed 512, which is 2^9. Thus, we will use 10 bits once and read x and y separately.

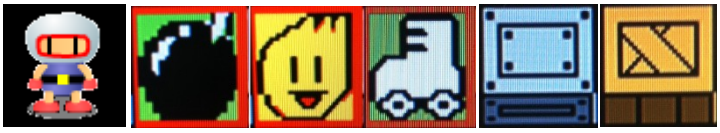
The states of the player mean player is dead or alive, if the player is dead, then do not show the player in the screen.

The below is one pattern of the Bomber Man :(going up)

```
--bombermanB0 outside--
sprite_bombermanB0(0) <= "00000000000000000000000000000000";
sprite_bombermanB0(1) <= "00000000000011111111110000000000";
sprite_bombermanB0(2) <= "00000000001000000001000000000000";
sprite_bombermanB0(3) <= "00000000110000000000110000000000";
sprite_bombermanB0(4) <= "00000001000000000000001000000000";
sprite_bombermanB0(5) <= "00000010000000000000000100000000";
sprite_bombermanB0(6) <= "00000010000000000000000100000000";
sprite_bombermanB0(7) <= "00000010000000000000000100000000";
sprite_bombermanB0(8) <= "00000010000000000000000100000000";
sprite_bombermanB0(9) <= "00000010000000000000000100000000";
sprite_bombermanB0(10) <= "00000010000000000000000100000000";
sprite_bombermanB0(11) <= "00000010000000000000000100000000";
sprite_bombermanB0(12) <= "00000010000000000000000100000000";
sprite_bombermanB0(13) <= "00000001000000000000001000000000";
sprite_bombermanB0(14) <= "00000000100000000000010000000000";
sprite_bombermanB0(15) <= "00000000010000000000100000000000";
sprite_bombermanB0(16) <= "00000000010000000000100000000000";
sprite_bombermanB0(17) <= "00000000100000000000010000000000";
sprite_bombermanB0(18) <= "00000001000000000000001000000000";
sprite_bombermanB0(19) <= "00000001000111111111110000100000";
sprite_bombermanB0(20) <= "00000010000111111111110000100000";
sprite_bombermanB0(21) <= "00000010000000000000000100000000";
sprite_bombermanB0(22) <= "00000001000000000000001000000000";
sprite_bombermanB0(23) <= "00000000111100000000111100000000";
sprite_bombermanB0(24) <= "00000000000100000000100000000000";
sprite_bombermanB0(25) <= "00000000111100011100011110000000";
sprite_bombermanB0(26) <= "00000001111000011100001111000000";
sprite_bombermanB0(27) <= "00000011100000111000000111000000";
sprite_bombermanB0(28) <= "00000011100000111000000111000000";
sprite_bombermanB0(29) <= "00000001111111111111111111000000";
sprite_bombermanB0(30) <= "00000000011111111111111100000000";
sprite_bombermanB0(31) <= "00000000000000000000000000000000";
```

The picture of the Bomber Man: (going down) and the items that can improve Bomber Man’s numbers of bomb he can put, power, speed, the boundary, and the box

that can be explored.



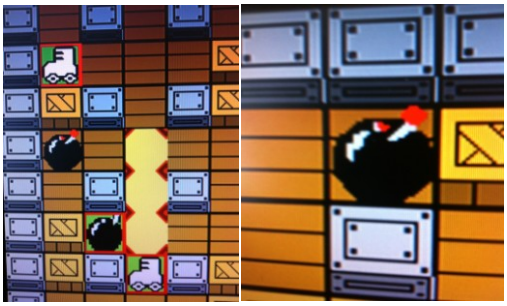
The logo of the Bomber Man:

C.H. Hsieh J. Wang
S.M. Cherng M. Wang

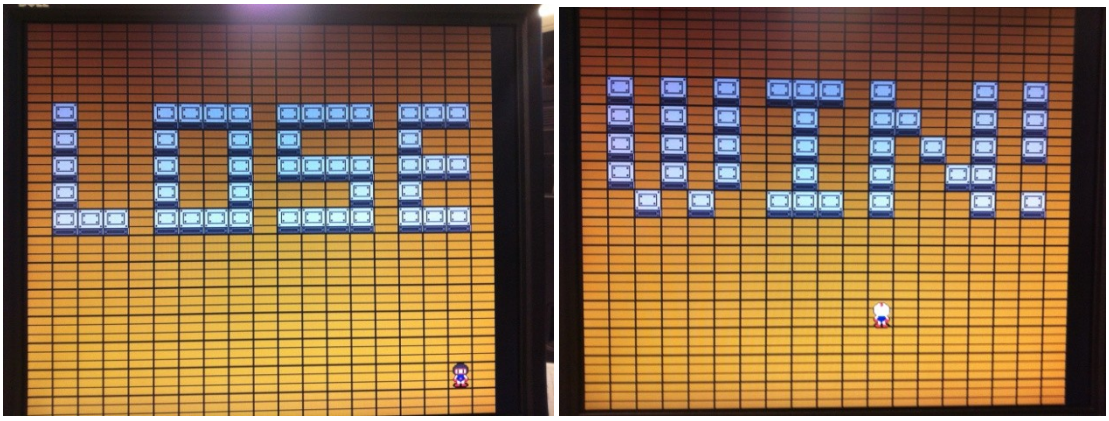
We can select the numbers of the players:

There is the whole map of Bomber Man:

The bomb and fire:



It will show the player “WIN!” if the player wins, “LOSE” otherwise:



c. Difficulties:

We use MatLab to analyze the pictures we get from Web site, and change it into the desired size we want, and divide the color into the several number we define(i.e. 5).The MatLab will form the sprite. However, the result we get is not so perfect; thus, we need to modify it by hand.

In addition, we use 200x200 to form the logo, it will cause us to compile about 2 hours. Without the logo, it takes about 11 minutes only. The time of compile will increase the difficulty of debugging.

5. Audio Controller

In order to make our game more vivid, we decided to add some sound and music into it. The audio part is based on lab 3, in which we input a data related to a special frequency. In our audio created module, we implement two different methods corresponding to explosion sound and music separately.

Music:

Since music is composed by notes which have constant frequencies, and can be synthesized by sine wave signals. We made a table which contains a 16-bit sine wave signals of a period in the module, and input a frequency parameter each time. For example, if we want to play a 440Hz sound, when the module receive the input data, it will change the output period to 1/440 s, output one whole sine wave every period. The table in our module contains 48 samples for a period, and each sample is presented by 16 bits. The hardware I/O port outputs one bit each time, so output the whole sine wave need output 48*16 = 768 times which need to be completed in 1/440 s.

We also set another counter parameter to control how long the sound should last which is set to 1s. After we can output the note, the next step is how to control it to play music. Eventually, we used software to solve this problem. In C library there is a sleep function which is sensible to clock. We can control the interval time between two input signal, for instance, if we want to play a note for 1s, after input this note's frequency parameter we wait for 1s to input the next note's frequency parameter. Another thing is that in order to play the music easily and efficient, we set the smallest time unit. For example, in a song, some notes may last several beats and others contain only one beat, then the notes that last one beat are only input once and those which are last more than one beat will be input several times sequentially.

Special sound:

We also need some special sound such as the explosion sound which does not have constant frequency, so a new solution is implemented. First of all, we find a suitable explosion sound source file and read it in the software "CoolEdit", in which we can

set the channel type, sample rate and sample bits of the wav file as shown in Figure1.

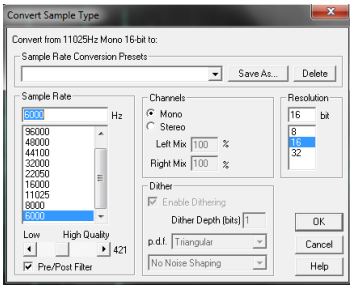


Figure1. reset parameters of the sound

After setting the parameters, we can get the new explosion sound file which is shown in Figure2 and Figure3.

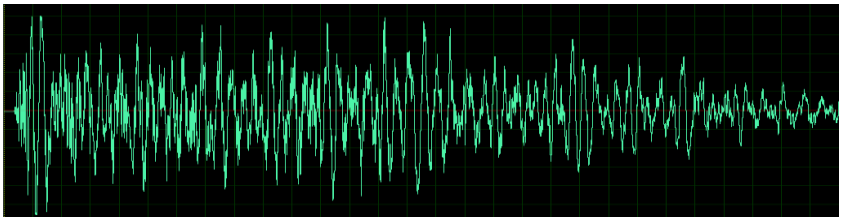


Figure2. original explosion sound file wave (sample rate = 11025)

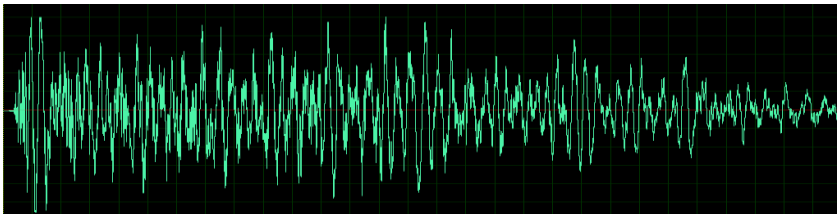


Figure3. new explosion sound file wave (sample rate = 4000)

Our purpose is to create a sound table and save it in the vhdl module, then we can scan it to output the sound whenever we need. Therefore, I wrote a C file, which will list in the end of this report, to read the wave file into a sample table, in which each sample is presented with 16 bits. In order to check the accuracy of this table, we can open the sound file in software “UltraEdit” to see the 16-bit sample in the wave file, as shown in Figure4.

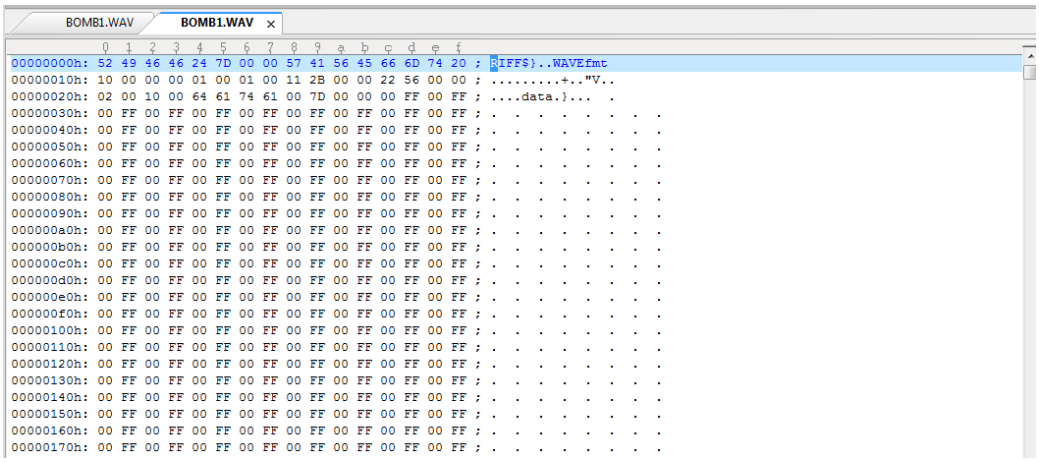


Figure4. wav file open in UltraEdit

Finally, when we get the table, save it in vhdl module, scan the whole table at the same sample rate with the wave file when we want to output the sound. Is should sound the same with the original sound source file, but because of the high frequency of explosion sound, it sounds much like a noise. The only thing we can do is to reduce the sample rate and save as many samples as possible.

The difficulties:

The music part is based on lab3, the only difference is control the time the notes should last. The solution for this problem is to set a global count signal to record the number of clock cycles, when it comes to 1s corresponding to the special frequency, keep the output sample the constant, then there will be no sound.

For the explosion sound part, it is different from lab3, but the idea is much easier. We create a table which contains 16-bit samples read from the source wav file and scan it when we want to output the sound. However, the explosion usually has a very high frequency which may be overflow the range of frequency in which the hardware will play sound correctly. For another thing, a sound file usually has a very high sample rate, which means even the sound only last 1 second, it also has many samples, for example, the standard sample rate may be more than 10000, we have to save more than 10000 samples in the table for only one second sound. So we tried to do down sampling, reducing the sample rate will cause a worse quality of the sound.

Finally, we choose a trade-off between number of samples and quality of sound. The sample rate of the explosion sound is reduced to 4000 samples/second, and more than 1000 samples are saved in the table. Though the sound can only last about a quarter of one second, it is enough for our project and performs a better quality.

6. Network Controller

1. Introduction

One essential part of this project is networking and synchronization between different terminals, i.e., players. (4 players maximum) All terminals will be interacting with each other through Ethernet connection. As in Lab2, Altera DE2 board's DM9000A chip that contains a fast 10/100 Mbps transceiver is employed to communication under CSMA/CD protocol.

During the communication, 4 players will send UDP/IP packages to each other and there is no concept like master or slave, in other words, all terminals are treated equally. Mainly four kinds of packages are passed around as illustrated below. Whenever one terminal makes a movement, places a bomber or the occurrence of

other special events, corresponding packets will be sent to other 3 terminals. Once receiving the packets, terminals would update their own screens after packet validation. On the other side, of course that the sending terminal itself would update its own screen.

2. Implementation

- DM9000A initialization

function *DM9000_init(unsigned char *mac_address)* handles the initialization of DM9000A module. *main()* routine will call this function at the system initialization stage (i.e, before the while loop). You need provide 48 bits MAC address as pass-in parameter. 48-24 bits is fixed with vendor, while the last three bytes can be randomly chosen by yourself.

- Transmit Packets

function *TransmitPacket(unsigned char *data_ptr, unsigned int tx_len)* handles packet transmission. You need provide buffer containing the packet and the length of packet in bytes. The function itself writes appropriate values in DM9000A *Packet Transmitting Buffer,* then waits until transmission is done and clears the Network Status Register.

- Receive Packets & ISR registration

Receive Packets is somehow more complex than sending out. First of all, you need employ *alt_irq_register()* function registers an ISR. If the function is successful, the requested interrupt is enabled on return.

alt_irq_register(DM9000A_IRQ, NULL, (void)ethernet_interrupt_handler);*

Argument *DM9000A_IRQ* is the interrupt to enable.

ethernet_interrupt_handler is the function that is called when the interrupt is active. This is because CPU need to be notified in the manner of interrupt when receiving packets and handle the interrupt afterwards.

Receive Packets is then handled by *ReceivePacket(unsigned char *data_ptr, unsigned int *rx_len)* inside *ethernet_interrupt_handler()* routine. On the successful receiving of intact packets, packet is parsed afterwards according to predefine packet format as discussed below.

- Packet format details
- max payload size is 128 bytes before the transmission of each new packet, certain values are renewed in UDP/IP header: checksum, packet ID and UDP packet length.

◦ Payload format (starts from offset of 42)

▪ buffer[42]: indicate the package sender or game step increment.

- 'g': game step increment
- integer 1,2,3,4: Sender is play1, play2, play3, play4 respectively

▪ buffer[43]: indicate which kind of info is being sent.

- 'm': movement coordination
- 's': new tile allocation
- 'p': new bomb placement

42	43	44	45	46	47	48
Sender (int)	'm'	X's 8 high bits	X's 8 low bits	Y's 8 high bits	Y's 8 low bits	0 (end)
Sender (int)	's'	Position X	Position Y	Tile Type	0 (end)	N/A
Sender (int)	'p'	Position X	Position Y	Power level	0 (end)	N/A
'g'	0 (end)	N/A	N/A	N/A	N/A	N/A

1. Other issues

- 2 players synchronization

We found the in-synchronization problem in 2 players mode. To better address this problem. Let us examine DM9000A closely.

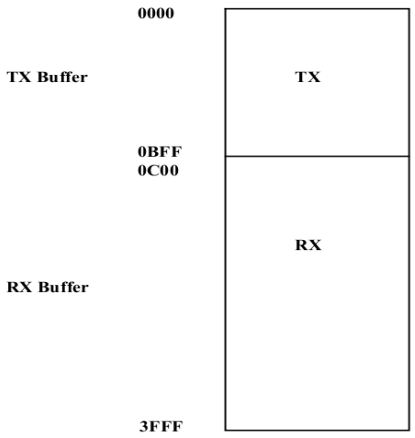


Figure 1 Packet Transmitting/Receiving Buffer

In Fig.1, we show the internal SRAM address 0~0x3FFF in the DM9000A. Before transmitting a packet, the data of the packet must be save into the TX FIFO SRAM, which is the TX Buffer area. Equivalently, the received and filtered packet's data save in the RX FIFO, which is the RX Buffer area. There are four bytes for the MAC header of each packet saving in the RX FIFO SRAM. The following diagram is shown the format of the received package frame:

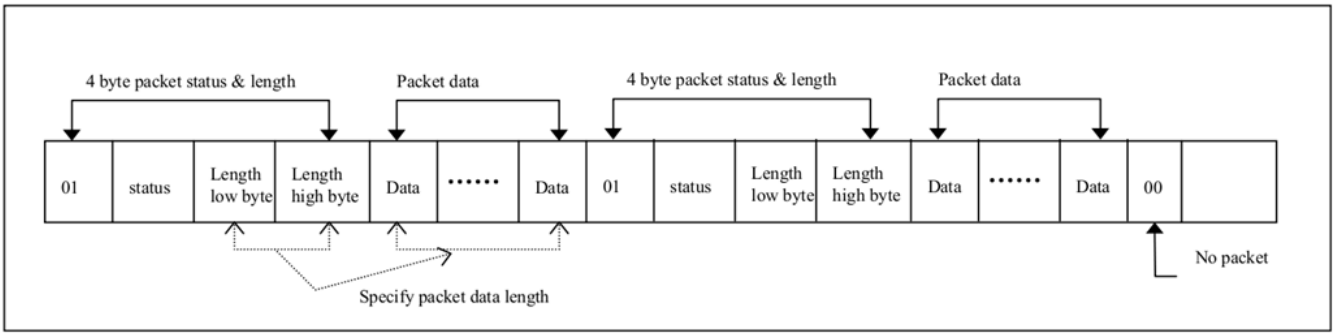


Figure 2 Block diagram of the Received Packets

As you may notice, multiple received packets can be stored in DM9000A. Notice that there is only one packet is received and parsed in *ethernet_interrupt_handler()* routine and interrupt is disabled while current interrupt handler routine is still working. Hence, if another packet is coming while the interrupt handler is still processing previous received packet, the incoming packet would be stored and delayed in DM9000A RX buffer. Another interrupt can not be triggered until the end of currently working interrupt handler process. Therefore if players are sending the packets really fast, packets can be delayed and accumulated, which consequently leads to serious synchronization problem.

The treatment of this issue is 10ms delay, which is added in between each packet transmission.

- 4 players synchronization

Problem solved in 2 players mode occurs again in 4 players mode, since 3 players can sent packets simultaneously which again causes the packet delay and accumulation problem. The treatment of this issue is scheduler which ensures players are sending the packet in turn. Of course the trade-off here is the reduction of game smoothness.

However in-synchronization problem is still bothering us. With aid of Wireshark and by examining packet bytes, we notice that when in-synchronization occurs, many DHCP packets are received which may be issued from switch. This hence leads to simultaneous arrival of more than one packet. So far, we have not been able to solve this issue yet.

7. Conclusion

Our project has some limitation because of the driver of DM9000A, so when we implement anything we need to consider the network performance. If we want to solve this problem, we need to rewrite the driver of DM9000A, However we found the problem too late, and rewriting driver may take lots of time. So we suggest future students should know the driver problem, and design their project carefully.

In addition, we find that the development of embedded system is really different from pure software development. There are lots of factors can cause problems. For example, in the network parts sometime we could not communicate with other machines, and the problem was in the router. We restarted the router, and the problem was solved. Also we found that there is certain probability that DE2 causes communication fail. We guess that some DE2s' Ethernet card might be broken. Because once we change the machine, and problems were solved. So we can know when we debug, we can not always debug our code. The bug may be not in our stuff.

This project takes us two months to finish it. We get lots of difficulties and solve them. Finally we think we do this project successfully, because many people like to play it. That is the happiest thing when we find some people like to play our game.

8. Division of work

Cheng-Han Hsieh

Basic system construction, software development, network implementation and design, and system integration.

Jian Wang

Concentrated on Audio research, and implement the audio controller and all audio stuffs.

Shang-Ming Chen

Develop all Sprites, design initial game frame, and implement the VGA controller.

Ming Wang

Network research and study on related works.

SOURCE CODE

----------Player1 Software----------

```
/*
 * "Hello World" example.
 *
 * This example prints 'Hello from Nios II' to the STDOUT stream. It runs on
 * the Nios II 'standard', 'full_featured', 'fast', and 'low_cost' example
 * designs. It runs with or without the MicroC/OS-II RTOS and requires a STDOUT
 * device in your system's hardware.
 * The memory footprint of this hosted application is ~69 kbytes by default
 * using the standard reference design.
 *
 * For a reduced footprint version of this template, and an explanation of how
 * to reduce the memory footprint for a given application, see the
 * "small_hello_world" template.
 *
 */

#include <stdio.h>
#include <alt_types.h>
#include <stdlib.h>
#include <io.h>
#include <system.h>
#include <time.h>
#include "sound.h"
#include "DM9000A.h"
#include "basic_io.h"
#include "bomb.h"
#include "fire.h"
#include "hello_world.h"

#define MAX_MSG_LENGTH 128
#define UDP_PACKET_PAYLOAD_OFFSET 42
#define UDP_PACKET_LENGTH_OFFSET 38
#define UDP_PACKET_PAYLOAD (transmit_buffer +
UDP_PACKET_PAYLOAD_OFFSET)
int test = 0;
int package = 0;
int gamestage = 0;
```

```
int player3on = 0;
int player4on = 0;
int pointer = 368;
int schedule = 32;
int turn = 0;
int initspeed = 6;
int playm= 0 ;
// Ethernet MAC address.    Choose the last three bytes yourself
unsigned char mac_address[6] = { 0x01, 0x60, 0x6E, 0x11, 0x02, 0x0F    };

unsigned int interrupt_number;



unsigned char transmit_buffer[] = {
   // Ethernet MAC header
   0xFF, 0xFF, 0xFF, 0xFF, 0xFF, 0xFF, // Destination MAC address
   0x01, 0x60, 0x6E, 0x11, 0xE2, 0x0F, // Source MAC address
   0x08, 0x00,                                    // Packet Type: 0x800 = IP

   // IP Header
   0x45,                    // version (IPv4), header length = 20 bytes
   0x00,                    // differentiated services field
   0x00,0x9C,               // total length: 20 bytes for IP header +
                             // 8 bytes for UDP header + 128 bytes for payload
   0x00, 0x00,              // packet ID
   0x00,                    // flags
   0x00,                    // fragment offset
   0x01,                    // time-to-live
   0x11,                    // protocol: 11 = UDP
   0xb6,0x00,               // header checksum: incorrect
   0xc0,0xa8,0x01,0x01, // source IP address
   0xFF,0xFF,0xFF,0xFF, // destination IP address

   // UDP Header
   0x67,0xd9, // source port port (26585: garbage)
   0x27,0x2b, // destination port (10027: garbage)
   0x00,0x88, // length (136: 8 for UDP header + 128 for data)
```

```
    0x00,0x00, // checksum: 0 = none

    // UDP payload
    0x74, 0x65, 0x73, 0x74, 0x20, 0x6d, 0x73, 0x67,
    0x74, 0x65, 0x73, 0x74, 0x20, 0x6d, 0x73, 0x67,
    0x74, 0x65, 0x73, 0x74, 0x20, 0x6d, 0x73, 0x67,
    0x74, 0x65, 0x73, 0x74, 0x20, 0x6d, 0x73, 0x67,
    0x74, 0x65, 0x73, 0x74, 0x20, 0x6d, 0x73, 0x67,
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    0x74, 0x65, 0x73, 0x74, 0x20, 0x6d, 0x73, 0x67,
    0x74, 0x65, 0x73, 0x74, 0x20, 0x6d, 0x73, 0x67
};

static void ethernet_interrupt_handler() {
    unsigned int receive_status;
    unsigned int receive_buffer_length;
    unsigned char receive_buffer[1600];
    //int i;
    int x,y;

    if ((receive_status = ReceivePacket(receive_buffer, &receive_buffer_length)) ==
DMFE_SUCCESS) {
      if(receive_buffer[27] == 0x00){
         printf("get dhcp");
         if(g.step==1)
         receive_status = ReceivePacket(receive_buffer, &receive_buffer_length);
      }
       if (receive_buffer_length >= 14) {
         //    A real Ethernet packet
```

```
        // A UDP packet
        if (receive_buffer_length >= UDP_PACKET_PAYLOAD_OFFSET) {
            if(receive_buffer[43] == 'm'){
                switch(receive_buffer[42]){
                    case 2:
                            x = (((int)receive_buffer[44])<<8) + receive_buffer[45];
                            y = (((int)receive_buffer[46])<<8) + receive_buffer[47];
                            p2.posX = x;
                            p2.posY = y;
                    break;
                    case 3:
                            x = (((int)receive_buffer[44])<<8) + receive_buffer[45];
                            y = (((int)receive_buffer[46])<<8) + receive_buffer[47];
                            p3.posX = x;
                            p3.posY = y;
                    break;
                    case 4:
                            x = (((int)receive_buffer[44])<<8) + receive_buffer[45];
                            y = (((int)receive_buffer[46])<<8) + receive_buffer[47];
                            p4.posX = x;
                            p4.posY = y;
                    break;
                }
            }
          else if(receive_buffer[43] == 'p'){

insert_bomb((int)receive_buffer[44],(int)receive_buffer[45],(int)receive_buffer[46],re
ceive_buffer[42]-1);
                    set_tile((int)receive_buffer[44],(int)receive_buffer[45],BOMB);
          }




        }

      } else {
        printf("Malformed Ethernet packet\n");
      }
```

```
   } else {
      printf("Error receiving packet\n");
   }

   /* Display the number of interrupts on the LEDs */
          dm9000a_iow(ISR, 0x3F);

            /* Re-enable DM9000A interrupts */
          dm9000a_iow(IMR, INTR_set);
  //          usleep(10000);
// if ((receive_status = ReceivePacket(receive_buffer, &receive_buffer_length)) ==
DMFE_SUCCESS)

}



void move(int x,int y){
              unsigned char x1,x2;
              unsigned char y1,y2;
              unsigned int packet_length;

              int curMsgChar = 0;
              for (curMsgChar=MAX_MSG_LENGTH-1; curMsgChar>0;
curMsgChar--) {
                    UDP_PACKET_PAYLOAD[curMsgChar] = 0;
              }
              if(transmit_buffer[25] == 0x00){
                   transmit_buffer[25] = 0xFF;

                   if(transmit_buffer[24] == 0x00)
                        transmit_buffer[24] = 0xFF;
                   else
                        transmit_buffer[24]--;

              }
              else
```

```
            transmit_buffer[25]--;

            if(transmit_buffer[19] == 0xFF){
                transmit_buffer[19] = 0x00;

                if(transmit_buffer[18] == 0xFF)
                    transmit_buffer[18] = 0x00;
                else
                    transmit_buffer[18]++;

            }
            else
            transmit_buffer[19]++;
            x1 = (unsigned char)x;
            x2 = (unsigned char)(x>>8);
  //            printf("number %d x    %d y %d\n",package,x,y);
      //        package++;
            y1 = (unsigned char)y;
            y2 = (unsigned char)(y>>8);


            UDP_PACKET_PAYLOAD[curMsgChar++] = 1;
            UDP_PACKET_PAYLOAD[curMsgChar++] = 'm';
            UDP_PACKET_PAYLOAD[curMsgChar++] = x2;
            UDP_PACKET_PAYLOAD[curMsgChar++] = x1;
            UDP_PACKET_PAYLOAD[curMsgChar++] = y2;
            UDP_PACKET_PAYLOAD[curMsgChar++] = y1;
            UDP_PACKET_PAYLOAD[curMsgChar++] = 0; // Terminate the string
            packet_length = 8 + curMsgChar;
            transmit_buffer[UDP_PACKET_LENGTH_OFFSET] = packet_length
>> 8;
            transmit_buffer[UDP_PACKET_LENGTH_OFFSET + 1] =
packet_length & 0xff;
            if (TransmitPacket(transmit_buffer,
UDP_PACKET_PAYLOAD_OFFSET + curMsgChar + 1)==DMFE_SUCCESS) {
                printf("\nMessage sent successfully\n");
            }else {
                printf("\nMessage sending failed\n");
```

```
		}
}

void put_bomb(int x, int y,int power){
		unsigned char x1;
		unsigned char y1;
		unsigned char power1;
		unsigned int packet_length;
		int curMsgChar = 0;
		for (curMsgChar=MAX_MSG_LENGTH-1; curMsgChar>0;
curMsgChar--) {
		  UDP_PACKET_PAYLOAD[curMsgChar] = 0;
		}
		if(transmit_buffer[25] == 0x00){
		    transmit_buffer[25] = 0xFF;

		    if(transmit_buffer[24] == 0x00)
		        transmit_buffer[24] = 0xFF;
		    else
		        transmit_buffer[24]--;

		}
		else
		transmit_buffer[25]--;
		if(transmit_buffer[19] == 0xFF){
		    transmit_buffer[19] = 0x00;
		    if(transmit_buffer[18] == 0xFF)
		        transmit_buffer[18] = 0x00;
		    else
		        transmit_buffer[18]++;
		}
		else
		transmit_buffer[19]++;
		x1 = (unsigned char)x;
		y1 = (unsigned char)y;
	//	printf("x %d y %d \n",x1,y1);

		power1 = (unsigned char)power;
```

```
		UDP_PACKET_PAYLOAD[curMsgChar++] = 1;
		UDP_PACKET_PAYLOAD[curMsgChar++] = 'p';
		UDP_PACKET_PAYLOAD[curMsgChar++] = x1;
		UDP_PACKET_PAYLOAD[curMsgChar++] = y1;
		UDP_PACKET_PAYLOAD[curMsgChar++] = power1;
		UDP_PACKET_PAYLOAD[curMsgChar++] = 0; // Terminate the string
		packet_length = 8 + curMsgChar;
		transmit_buffer[UDP_PACKET_LENGTH_OFFSET] = packet_length
>> 8;
		transmit_buffer[UDP_PACKET_LENGTH_OFFSET + 1] =
packet_length & 0xff;
		if (TransmitPacket(transmit_buffer,
UDP_PACKET_PAYLOAD_OFFSET + curMsgChar + 1)==DMFE_SUCCESS) {
			printf("\nMessage sent successfully\n");
		}else {
			printf("\nMessage sending failed\n");
		}
}

void set_pointer(int pos){
		unsigned int packet_length;
		int curMsgChar = 0;
		for (curMsgChar=MAX_MSG_LENGTH-1; curMsgChar>0;
curMsgChar--) {
		  UDP_PACKET_PAYLOAD[curMsgChar] = 0;
		}
		if(transmit_buffer[25] == 0x00){
		    transmit_buffer[25] = 0xFF;

		    if(transmit_buffer[24] == 0x00)
		        transmit_buffer[24] = 0xFF;
		    else
		        transmit_buffer[24]--;

		}
		else
		transmit_buffer[25]--;
		if(transmit_buffer[19] == 0xFF){
```

```
                transmit_buffer[19] = 0x00;
                if(transmit_buffer[18] == 0xFF)
                    transmit_buffer[18] = 0x00;
                else
                    transmit_buffer[18]++;
            }
            else
            transmit_buffer[19]++;
            pos = pos/4;
            UDP_PACKET_PAYLOAD[curMsgChar++] = 't';
            UDP_PACKET_PAYLOAD[curMsgChar++] = pos;
            UDP_PACKET_PAYLOAD[curMsgChar++] = 0; // Terminate the string
            packet_length = 8 + curMsgChar;
            transmit_buffer[UDP_PACKET_LENGTH_OFFSET] = packet_length
>> 8;
            transmit_buffer[UDP_PACKET_LENGTH_OFFSET + 1] =
packet_length & 0xff;
            if (TransmitPacket(transmit_buffer,
UDP_PACKET_PAYLOAD_OFFSET + curMsgChar + 1)==DMFE_SUCCESS) {
                printf("\nMessage sent successfully\n");
            }else {
                printf("\nMessage sending failed\n");
            }
}

void game_set(int step){
            unsigned int packet_length;
            int curMsgChar = 0;
            for (curMsgChar=MAX_MSG_LENGTH-1; curMsgChar>0;
curMsgChar--) {
                UDP_PACKET_PAYLOAD[curMsgChar] = 0;
            }
            if(transmit_buffer[25] == 0x00){
                transmit_buffer[25] = 0xFF;

                if(transmit_buffer[24] == 0x00)
                    transmit_buffer[24] = 0xFF;
                else
```

```
                transmit_buffer[24]--;

            }
            else
            transmit_buffer[25]--;
            if(transmit_buffer[19] == 0xFF){
                transmit_buffer[19] = 0x00;
                if(transmit_buffer[18] == 0xFF)
                    transmit_buffer[18] = 0x00;
                else
                    transmit_buffer[18]++;
            }
            else
            transmit_buffer[19]++;

            UDP_PACKET_PAYLOAD[curMsgChar++] = 'g';
            UDP_PACKET_PAYLOAD[curMsgChar++] = step;
            UDP_PACKET_PAYLOAD[curMsgChar++] = 0; // Terminate the string
            packet_length = 8 + curMsgChar;
            transmit_buffer[UDP_PACKET_LENGTH_OFFSET] = packet_length
>> 8;
            transmit_buffer[UDP_PACKET_LENGTH_OFFSET + 1] =
packet_length & 0xff;
            if (TransmitPacket(transmit_buffer,
UDP_PACKET_PAYLOAD_OFFSET + curMsgChar + 1)==DMFE_SUCCESS) {
                printf("\nMessage sent successfully\n");
            }else {
                printf("\nMessage sending failed\n");
            }
}



void winf(){
        int i,j;
        for(i = 0 ; i < 15 ; i++){
            for(j = 0 ; j < 19 ; j++){
               usleep(5000);
```

```
                control_array[i][j] = win[i][j];

IOWR_16DIRECT(RASTER_BASE,18,j+i*32+control_array[i][j]*32*32);
            }
        }

}

void losef(){
            int i,j;
        for(i = 0 ; i < 15 ; i++){
            for(j = 0 ; j < 19 ; j++){
               usleep(5000);
               control_array[i][j] = lose[i][j];

IOWR_16DIRECT(RASTER_BASE,18,j+i*32+control_array[i][j]*32*32);
            }
        }

}

void setmap(){
        int i,j;
        for(i = 0 ; i < 15 ; i++){
            for(j = 0 ; j < 19 ; j++){

IOWR_16DIRECT(RASTER_BASE,18,j+i*32+control_array[i][j]*32*32);
            }
        }
}

void mapgen(){
       int i,j,seed;
       srand(time(NULL));
       for(i = 0 ; i < 15 ; i++){
           for(j = 0 ; j < 19 ; j++){
               control_array[i][j]=initial[i][j];
           }
```

```
        }

        for(i = 1 ; i < 14 ; i++){
              for(j = 1 ; j < 19 ; j++){
                 ////reserve corner
                 if((i <= 2 && j <=2) || (i >= 12 && j<=2) ||(i <= 2&& j>=16 ) || (i >=
12&& j>=16 )) continue;
                 ///skip concrete
                 if(control_array[i][j] == CONCRETE) continue;

                 seed = rand()%2;
                 if(seed)    control_array[i][j] = BRICK;
              }
        }
}

void set_tile(int x, int y, int thing){
        IOWR_16DIRECT(RASTER_BASE,18,x+y*32+thing*32*32);
        control_array[y][x] = thing;
}
void reset(){
        p1.state = 0;
        p2.state = 0;
        p3.state = 0;
        p4.state = 0;
        IOWR_16DIRECT(RASTER_BASE,22,p1.state);
        IOWR_16DIRECT(RASTER_BASE,24,p2.state);
        IOWR_16DIRECT(RASTER_BASE,26,p3.state);
        IOWR_16DIRECT(RASTER_BASE,28,p4.state);
        g.step = 0;
        IOWR_16DIRECT(RASTER_BASE,20 ,g.step);
        p1.posX = 0x0030;
        p1.posY = 0x0030;
        p2.posX = 0x0230;
        p2.posY = 0x01B0;
        p3.posX = 0x0230;
        p3.posY = 0x0030;
        p4.posX = 0x0030;
```

```
        p4.posY = 0x01B0;
        p1.pos1X = (p1.posX - p1.posX%32)/32;
        p1.pos1Y = (p1.posY - p1.posY%32)/32;
        p1.speed = initspeed;
        p1.bomb    = 1;
        p1.power = 1;
        playm = 0;
        IOWR_16DIRECT(RASTER_BASE,0 ,p1.posX);
        IOWR_16DIRECT(RASTER_BASE,2 ,p1.posY);
        IOWR_16DIRECT(RASTER_BASE,4 ,p2.posX);
        IOWR_16DIRECT(RASTER_BASE,6 ,p2.posY);
        IOWR_16DIRECT(RASTER_BASE,8    ,p3.posX);
        IOWR_16DIRECT(RASTER_BASE,10 ,p3.posY);
        IOWR_16DIRECT(RASTER_BASE,12 ,p4.posX);
        IOWR_16DIRECT(RASTER_BASE,14 ,p4.posY);
}


//////bomb 1 fire 2 brick 3 powerup 4 bombup 5 speedup 6 concrete 15
int main(){
   int code;
   int tempxleft;
   int tempxright;
   int tempy;
   int i,j;
   printf("Ready\n");

   DM9000_init(mac_address);
   alt_irq_register(DM9000A_IRQ, NULL, (void*)ethernet_interrupt_handler);
   reset();
   mapgen();
   setmap();
   r.p1 = 0;
   r.p2 = 0;
   r.p3 = 0;
   r.p4 = 0;

  start_music();
```

```
 while(1){

while((!IORD_8DIRECT(PS2_BASE,0))||(g.current_time%schedule!=turn)){
        if(g.step == 0){
        IOWR_16DIRECT(RASTER_BASE,30,pointer);
        }else{
        p2.pos1X = (p2.posX - p2.posX%32)/32;
        p2.pos1Y = (p2.posY - p2.posY%32)/32;
        p3.pos1X = (p3.posX - p3.posX%32)/32;
        p3.pos1Y = (p3.posY - p3.posY%32)/32;
        p4.pos1X = (p4.posX - p4.posX%32)/32;
        p4.pos1Y = (p4.posY - p4.posY%32)/32;
        if(control_array[p1.pos1Y][p1.pos1X]==FIRE){
           p1.state = DEAD;
           IOWR_16DIRECT(RASTER_BASE,22,p1.state);
        }
        if(control_array[p2.pos1Y][p2.pos1X]==FIRE){
           p2.state = DEAD;
           IOWR_16DIRECT(RASTER_BASE,24,p2.state);
        }
        if(control_array[p3.pos1Y][p3.pos1X]==FIRE){
           p3.state = DEAD;
           IOWR_16DIRECT(RASTER_BASE,26,p3.state);
        }
        if(control_array[p4.pos1Y][p4.pos1X]==FIRE){
           p4.state = DEAD;
           IOWR_16DIRECT(RASTER_BASE,28,p4.state);
        }

        if(p1.state + p2.state + p3.state + p4.state >= 3){
                g.step = 2;
                if(p1.state == DEAD){
                   losef();

                }else{
                   winf();
                }
                if(playm ==0){
```

```
            win_sound();
            playm = 1;
            }
        }

        if(control_array[p2.pos1Y][p2.pos1X]==POWERUP
          ||control_array[p2.pos1Y][p2.pos1X]==BOMBUP
          ||control_array[p2.pos1Y][p2.pos1X]==SPEEDUP){
            set_tile(p2.pos1X,p2.pos1Y,EMPTY);
        }
        if(control_array[p3.pos1Y][p3.pos1X]==POWERUP
          ||control_array[p3.pos1Y][p3.pos1X]==BOMBUP
          ||control_array[p3.pos1Y][p3.pos1X]==SPEEDUP){
            set_tile(p3.pos1X,p3.pos1Y,EMPTY);
        }
        if(control_array[p4.pos1Y][p4.pos1X]==POWERUP
          ||control_array[p4.pos1Y][p4.pos1X]==BOMBUP
          ||control_array[p4.pos1Y][p4.pos1X]==SPEEDUP){
            set_tile(p4.pos1X,p4.pos1Y,EMPTY);
        }
        IOWR_16DIRECT(RASTER_BASE,0    ,p1.posX);
        IOWR_16DIRECT(RASTER_BASE,2    ,p1.posY);
        IOWR_16DIRECT(RASTER_BASE,4    ,p2.posX);
        IOWR_16DIRECT(RASTER_BASE,6    ,p2.posY);
        IOWR_16DIRECT(RASTER_BASE,8    ,p3.posX);
        IOWR_16DIRECT(RASTER_BASE,10 ,p3.posY);
        IOWR_16DIRECT(RASTER_BASE,12 ,p4.posX);
        IOWR_16DIRECT(RASTER_BASE,14 ,p4.posY);
        countdown_bomb();
        countdown_fire();
        g.current_time = IORD_16DIRECT(RASTER_BASE,0);
        }
}


code = IORD_8DIRECT(PS2_BASE,4);
printf("%d\n",code);
if(g.step == 1){
```

```
switch(code){
   case 117: //up
         p1.pos1X = (p1.posX - p1.posX%32)/32;
         tempxleft = (p1.posX-5)/32;
         tempxright = (p1.posX+5)/32;
         p1.pos1Y = (p1.posY - p1.posY%32)/32;
         if(control_array[p1.pos1Y-1][p1.pos1X]==EMPTY
           ||control_array[p1.pos1Y-1][p1.pos1X]==FIRE
           ||control_array[p1.pos1Y-1][p1.pos1X]==POWERUP
           ||control_array[p1.pos1Y-1][p1.pos1X]==BOMBUP
           ||control_array[p1.pos1Y-1][p1.pos1X]==SPEEDUP)
         p1.posY -= p1.speed;
         else{
         p1.posY -= p1.speed;
         if(p1.posY <= p1.pos1Y*32+16)
                  p1.posY = p1.pos1Y*32+15;
         }
         move(p1.posX,p1.posY);
         usleep(10000);
   break;
   case 114: //down
         p1.pos1X = (p1.posX - p1.posX%32)/32;
         p1.pos1Y = (p1.posY - p1.posY%32)/32;
         tempxleft = (p1.posX-5)/32;
         tempxright = (p1.posX+5)/32;
         if((control_array[p1.pos1Y+1][p1.pos1X]==EMPTY)
           ||control_array[p1.pos1Y-1][p1.pos1X]==FIRE
           ||control_array[p1.pos1Y+1][p1.pos1X]==POWERUP
           ||control_array[p1.pos1Y+1][p1.pos1X]==BOMBUP
           ||control_array[p1.pos1Y+1][p1.pos1X]==SPEEDUP)
         p1.posY += p1.speed;
         else{
         p1.posY += p1.speed;
         if(p1.posY >= p1.pos1Y*32+16)
                  p1.posY = p1.pos1Y*32+17;
         }
```

```
        move(p1.posX,p1.posY);

        usleep(10000);
    break;
    case 107: //left
        p1.pos1X = (p1.posX - p1.posX%32)/32;
        p1.pos1Y = (p1.posY - p1.posY%32)/32;
        tempy    = (p1.posY +14)/32;
        if((control_array[p1.pos1Y][p1.pos1X-1]==EMPTY&&
              control_array[tempy][p1.pos1X-1]==EMPTY)
         ||control_array[p1.pos1Y-1][p1.pos1X]==FIRE
         ||control_array[p1.pos1Y][p1.pos1X-1]==POWERUP
         ||control_array[p1.pos1Y][p1.pos1X-1]==BOMBUP
         ||control_array[p1.pos1Y][p1.pos1X-1]==SPEEDUP)
         p1.posX -= p1.speed;
        else{
        p1.posX -= p1.speed;
        if(p1.posX <= p1.pos1X*32+16)
                p1.posX = p1.pos1X*32+15;
        }
        move(p1.posX,p1.posY);
        usleep(10000);
    break;
    case 116:
        p1.pos1X = (p1.posX - p1.posX%32)/32;
        p1.pos1Y = (p1.posY - p1.posY%32)/32;
        tempy = (p1.posY +14)/32;
        if((control_array[p1.pos1Y][p1.pos1X+1]==EMPTY&&
              control_array[tempy][p1.pos1X+1]==EMPTY)
         ||control_array[p1.pos1Y-1][p1.pos1X]==FIRE
         ||control_array[p1.pos1Y][p1.pos1X+1]==POWERUP
         ||control_array[p1.pos1Y][p1.pos1X+1]==BOMBUP
         ||control_array[p1.pos1Y][p1.pos1X+1]==SPEEDUP)
        p1.posX += p1.speed;
        else{
        p1.posX += p1.speed;
        if(p1.posX >= p1.pos1X*32+16)
                p1.posX = p1.pos1X*32+17;
```

```
            }
            move(p1.posX,p1.posY);

            usleep(10000);
        break;
        case 41:
            p1.pos1X = (p1.posX - p1.posX%32)/32;
            p1.pos1Y = (p1.posY - p1.posY%32)/32;
            if(control_array[p1.pos1Y][p1.pos1X] == EMPTY &&
checkbomb(p1.bomb)){

                insert_bomb(p1.pos1X,p1.pos1Y, p1.power,player1);
                set_tile(p1.pos1X,p1.pos1Y,BOMB);
                put_bomb(p1.pos1X, p1.pos1Y,p1.power);
                usleep(10000);
            }
        break;
         case 20:
            p1.pos1X = (p2.posX - p2.posX%32)/32;
            p1.pos1Y = (p2.posY - p2.posY%32)/32;
            if(control_array[p1.pos1Y][p1.pos1X] == EMPTY &&
checkbomb(p1.bomb)){

                insert_bomb(p1.pos1X,p1.pos1Y,10,player1);
                set_tile(p1.pos1X,p1.pos1Y,BOMB);
                put_bomb(p1.pos1X, p1.pos1Y,p1.power);
        //              usleep(10000);
            }

        break;

        default:
        break;
      }

      if(control_array[p1.pos1Y][p1.pos1X]==POWERUP){
          p1.power++;
          set_tile(p1.pos1X,p1.pos1Y,EMPTY);
```

```
    }
    if(control_array[p1.pos1Y][p1.pos1X]==BOMBUP){
        p1.bomb++;
        set_tile(p1.pos1X,p1.pos1Y,EMPTY);
    }
    if(control_array[p1.pos1Y][p1.pos1X]==SPEEDUP){
        if(p1.speed < 10)
        p1.speed++;
        set_tile(p1.pos1X,p1.pos1Y,EMPTY);
    }

  }//gamestep == 1;
if(g.step == 0){
    switch(code){
          case 117:
             pointer -= 16;
             if(pointer<368)pointer = 400;

             do{
                while((!IORD_8DIRECT(PS2_BASE,0)));
                code = IORD_8DIRECT(PS2_BASE,4);
             }while(code!=117);
             set_pointer(pointer);
              usleep(10000);
          break;
          case 114:
             pointer += 16;
             if(pointer>400)pointer = 368;

             do{
                while((!IORD_8DIRECT(PS2_BASE,0)));
                code = IORD_8DIRECT(PS2_BASE,4);
             }while(code!=114);
             set_pointer(pointer);
             usleep(10000);
          break;
          case 90:
             if(pointer == 368){
```

```
                schedule = 4;
                turn = 0;
                p3.state = DEAD;
                p4.state = DEAD;
                IOWR_16DIRECT(RASTER_BASE,26,p3.state);
                IOWR_16DIRECT(RASTER_BASE,28,p4.state);
            } else if(pointer == 384){
                schedule = 18;
                turn = 0;
                p4.state = DEAD;
                IOWR_16DIRECT(RASTER_BASE,28,p4.state);
            }
            g.step = 1;
            IOWR_16DIRECT(RASTER_BASE,20 ,g.step);
            game_set(g.step);
        break;
    }
  }
  if(g.step == 2){
      if(code == 118){
          reset();
          mapgen();
          setmap();
          game_set(g.step);
      }
   }

 }

  return 0;
}
```

```
-------------------------------VGA CONTROLLLER-----------------------------------------
library ieee;
use ieee.std_logic_1164.all;
use ieee.numeric_std.all;

entity de2_vga_raster1 is

   port (
      reset : in std_logic;
      clk      : in std_logic;
      read             : in    std_logic;
      write            : in    std_logic;
      chipselect : in    std_logic;
      address        : in    unsigned(7 downto 0);
      readdata      : out unsigned(15 downto 0);
      writedata    : in    unsigned(15 downto 0);

      VGA_CLK,                                    -- Clock -- Should be 25.125 MHz
      VGA_HS,                                    -- H_SYNC
      VGA_VS,                                    -- V_SYNC
      VGA_BLANK,                                   -- BLANK
      VGA_SYNC : out std_logic;              -- SYNC
      VGA_R,                                      -- Red[9:0]
      VGA_G,                                      -- Green[9:0]
      VGA_B : out unsigned(9 downto 0) -- Blue[9:0]
      );

end de2_vga_raster1;

architecture rtl of de2_vga_raster1 is

   -- Video parameters

   constant HTOTAL             : integer := 800;
   constant HSYNC              : integer := 96;
   constant HBACK_PORCH    : integer := 48;
   constant HACTIVE            : integer := 640;
   constant HFRONT_PORCH : integer := 16;
```

```
    constant VTOTAL       : integer := 525;
    constant VSYNC        : integer := 2;
    constant VBACK_PORCH  : integer := 33;
    constant VACTIVE      : integer := 480;
    constant VFRONT_PORCH : integer := 10;
    -- Signals for the video controller
    signal Hcount : unsigned(9 downto 0);  -- Horizontal position (0-800)
    signal Vcount : unsigned(9 downto 0);  -- Vertical position (0-524)
    signal EndOfLine, EndOfField : std_logic;

    signal vga_hblank, vga_hsync,
       vga_vblank, vga_vsync : std_logic;  -- Sync. signals

    signal clk_counter : std_logic := '0';

    ------------------------------player coordinates pos state----------------------------------

    signal player1_x : unsigned (9 downto 0) := "0000110000";     -- the x_pos of the
player1
    signal player1_y : unsigned (9 downto 0) := "0000110000";     -- the y_pos of the
player1
    signal player1_pos  : unsigned (1 downto 0) := "10";            -- face down
    signal player1_s : unsigned (2 downto 0) := "000";              -- the state of the
player1

    ------------------------------------------------------------------------------------------
    signal player2_x : unsigned (9 downto 0) := "1000110000";     -- the x_pos of the
player2
    signal player2_y : unsigned (9 downto 0) := "0110110000";     -- the y_pos of the
player2
    signal player2_pos  : unsigned (1 downto 0) := "10";            -- face down
    signal player2_s : unsigned (2 downto 0) := "000";              -- the state of the
player2
    ------------------------------------------------------------------------------------------
    signal player3_x : unsigned (9 downto 0) := "1000110000";     -- the x_pos of the
player3
    signal player3_y : unsigned (9 downto 0) := "0000110000";     -- the y_pos of the
```

```
player3
   signal player3_pos    : unsigned (1 downto 0) := "10";              -- face down
   signal player3_s : unsigned (2 downto 0) := "000";                  -- the state of the
player3
   ------------------------------------------------------------------------------------------
   signal player4_x : unsigned (9 downto 0) := "0000110000";      -- the x_pos of the
player4
   signal player4_y : unsigned (9 downto 0) := "0110110000";      -- the y_pos of the
player4
   signal player4_pos    : unsigned (1 downto 0) := "10";              -- face down
   signal player4_s : unsigned (2 downto 0) := "000";                  -- the state of the
player4
   --------------------------------title-----------------------------------------------
   signal title_x : unsigned (9 downto 0)      := "0100110000";      -- the x_pos of the
title
   signal title_y : unsigned (9 downto 0)      := "0110000000";      -- the y_pos of the
title
   --------------------------------pointer---------------------------------------------
   signal pointer_x : unsigned (9 downto 0) := "0011101000";      -- the x_pos of the
title
   signal pointer_y : unsigned (9 downto 0) := "0110000000";      -- the y_pos of the
title
   --------------------------------logo------------------------------------------------
   signal logo_x : unsigned (9 downto 0)       := "0100110000";      -- the x_pos of the
logo
   signal logo_y : unsigned (9 downto 0)       := "0011000000";      -- the y_pos of the
logo
   --------------------------------Game Settings---------------------------------------
   ----gamestage "0000" preparing      "0001" playing "0010"
gameover-----------------------
   signal gamestage : unsigned (3 downto 0) := "0000";
   -----------playing status-------------
   signal playing : unsigned (3 downto 0) := "0001";
   ----timer for the game units = 0.01s-----------------------------------------------
   signal timer : unsigned(15 downto 0) := (others => '0');
```

```
type array_type_32x32 is array (31 downto 0) of unsigned (31 downto 0);
signal sprite_background0    : array_type_32x32;
signal sprite_background1    : array_type_32x32;
signal sprite_concrete0      : array_type_32x32;
signal sprite_concrete1      : array_type_32x32;
signal sprite_concrete2      : array_type_32x32;
signal sprite_bomber0        : array_type_32x32;
signal sprite_bomber1        : array_type_32x32;
signal sprite_bomber2        : array_type_32x32;
signal sprite_bomber3        : array_type_32x32;
signal sprite_fire0          : array_type_32x32;
signal sprite_fire1          : array_type_32x32;
signal sprite_fire2          : array_type_32x32;
signal sprite_fireM0         : array_type_32x32;
signal sprite_fireM1         : array_type_32x32;
signal sprite_fireM2         : array_type_32x32;
signal sprite_brick0         : array_type_32x32;
signal sprite_brick1         : array_type_32x32;
signal sprite_brick2         : array_type_32x32;
signal sprite_powerup0       : array_type_32x32;
signal sprite_powerup1       : array_type_32x32;
signal sprite_powerup2       : array_type_32x32;
signal sprite_bombup0        : array_type_32x32;
signal sprite_bombup1        : array_type_32x32;
signal sprite_bombup2        : array_type_32x32;
signal sprite_bombup3        : array_type_32x32;
signal sprite_speedup0       : array_type_32x32;
signal sprite_speedup1       : array_type_32x32;
signal sprite_speedup2       : array_type_32x32;
signal sprite_speedup3       : array_type_32x32;
signal sprite_bomberman0     : array_type_32x32;
signal sprite_bomberman1     : array_type_32x32;
signal sprite_bomberman2     : array_type_32x32;
signal sprite_bomberman3     : array_type_32x32;
signal sprite_bomberman4     : array_type_32x32;
signal sprite_bombermanB0    : array_type_32x32;
signal sprite_bombermanB1    : array_type_32x32;
signal sprite_bombermanB2    : array_type_32x32;
```

```
    signal sprite_bombermanB3    : array_type_32x32;
    signal sprite_bombermanB4    : array_type_32x32;
    signal sprite_bombermanL0    : array_type_32x32;
    signal sprite_bombermanL1    : array_type_32x32;
    signal sprite_bombermanL2    : array_type_32x32;
    signal sprite_bombermanL3    : array_type_32x32;
    signal sprite_bombermanL4    : array_type_32x32;
-----------------------------Control Array---------------------------------
    type array_type_15x120 is array (14 downto 0, 119 downto 0) of std_logic;
-------------------------beginning title---------------------------------
    type array_type_16x16 is array (15 downto 0) of unsigned (15 downto 0);
    type array_type_48x128 is array (47 downto 0) of unsigned (127 downto 0);
    type array_type_200x200 is array (199 downto 0) of unsigned (199 downto 0);
signal sprite_bombermanlogo0    : array_type_200x200;
signal sprite_bombermanlogo1    : array_type_200x200;
signal sprite_bombermanlogo2    : array_type_200x200;
signal sprite_bombermanlogo3    : array_type_200x200;


  ---------------------------------------------------------------------
     signal control_array: array_type_15x120 :=

("111111111111111111111111111111111111111111111111111111111111111111111111
111111111111111111111111111111111111111111000000",

"111111000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000111111000000",

"111111000001111110000011111100000111111000001111110000011111100000
001111110000011111100000111111000000111111000000",

"111111000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000111111000000",

"111111000001111110000011111100000111111000001111110000011111100000
001111110000011111100000111111000000111111000000",

"111111000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000111111000000",
```

```
"111111000000011111100000001111110000000111111000000011111100000001111110000
00111111000000011111100000001111110000000111111000000",

"111111000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000111111000000",

"111111000000011111100000001111110000000111111000000011111100000001111110000
00111111000000011111100000001111110000000111111000000",

"111111000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000111111000000",

"111111000000011111100000001111110000000111111000000011111100000001111110000
00111111000000011111100000001111110000000111111000000",

"111111000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000111111000000",

"111111000000011111100000001111110000000111111000000011111100000001111110000
00111111000000011111100000001111110000000111111000000",

"111111000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000111111000000",

"111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111000000"
  );

    ---2 or 4 players----
    signal title: array_type_48x128 :=

("000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000",

     "00011111111111000000111111111110000011110000000000000111111111100001
1110000001111000111111111111000011111111110000000111111111000",
     "000111111111111000001111111111110000111100000000000011111111111100011
```

1100000011110011111111111111100011111111111100001111111111100",

"01111000000111100111110011111000111000000000000111111001111111000
1110000001110001111000000000000111111001111110011111111111110",

"01111000000111100111100001111100011100000000000111110000111111000
1110000001110001111000000000000111111001111110011111111111110",

"00000000011111100111110000111110001110000000000011111000011111000
0111100111100001111000000000000111110000111110011110000000000",

"00000000011111100111111001111110001110000000000011111100111111000
0111100111100001111000000000000111110000111100011110000000000",

"0000011111111000011111111111110000111100000000000111111111111000
0011111111000001111111111111100111111001111000011111111111000",

"0000011111111000011111111111100000111100000000000111111111111000
0001111110000001111111111111100111111111110000001111111111100",

"0001111111100000011110000000000000011110000000000011110000011111100
0000011110000000111100000000000011111111111100000011111111110",

"0001111111100000011110000000000000011110000000000011110000000111100
0000011110000000111100000000000011110000011110000000000001111110",

"0111111000000000011110000000000000011110000000000011110000000111100
0000011110000000111100000000000011110000001111000000000001111110",

"0111111000000000011110000000000000011111111111100011110000001111000
0000111100000000111100000000000011110000001111001111111111111110",

"0111111111111110011110000000000000011111111111100011110000001111000
0000111100000000111111111111110011110000001111000111111111100",

"0111111111111110011110000000000000011111111111100011110000001111000
0000111100000000111111111111100111100000011110000111111111000",

"0000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000",

"0000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000",

"00000111111110000000111111111100000111100000000000001111111100001
1110000001111000111111111111100001111111110000000111111111000",

"0000111111111000001111111111110000111100000000000011111111110001
1110000001111001111111111111100011111111111100001111111111100",

"0001100001111000011111100111111000111000000000000111111001111111000
1110000001110001111000000000000111111001111110011111111111110",

"00011000011110000111110000111110001110000000000001111100001111111000
1110000001110001111000000000000111111001111110011111111111110",

"000000000111100001111100001111100011110000000000001111100001111000
0111100111100001111000000000000111110000111110011110000000000",
"000000000111100001111100111111000111100000000000011111100111111000
0111100111100001111000000000000111110000111100011110000000000",
"000000011110000000111111111111100001111000000000000111111111111000
001111111100000111111111111100111111001111000011111111111000",
"000000011110000000111111111111000001111000000000000111111111111000
000111111000000111111111111100111111111100000011111111111100",
"000000000111111001111000000000000001111000000000000111100000111100
000001111000000011110000000000001111111111100000011111111110",
"000000000111111001111000000000000001111000000000000111100000111100
000001111000000011110000000000001111000001111000000000001111110",
"011000000001111001111000000000000001111000000000000111100000111100
000001111000000011110000000000001111000000111100000000001111110",
"011000000001111001111000000000000001111111111110001111000000111000
0000111100000001111000000000000111100000011110011111111111110",
"000111111111100001111000000000000001111111111110001111000000111000
0000111100000001111111111111100111100000011110001111111111100",
"000111111111100001111000000000000001111111111110001111000000111000
0000111100000000111111111111100111100000011110000111111111000",
"000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000",
"000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000",
"000000011111100000011111111100000111100000000000001111111110000
1111000000111100011111111111100001111111111000000011111111000",
"000000011111100000111111111111000011110000000000001111111111110001
11100000011110011111111111111000111111111111000011111111111100",
"000001111111100001111110011111100011110000000000001111110011111000
1110000001110001111000000000000111111001111110011111111111110",
"000001111111100001111100001111100011110000000000001111100001111000
1110000001110001111000000000000111111001111110011111111111110",
"000111100111100001111100001111100011110000000000001111100001111000
0111100111100001111000000000000111110000111110011110000000000",
"000111100111100001111110011111100011110000000000001111110011111000
0111100111100001111000000000000111110000111100011110000000000",
"001110000111100001111111111111000011110000000000001111111111111000
001111111100000111111111111100111111001111000011111111111000",

```
    "0011100001111000011111111111000001111000000000001111111111111000
0001111100000011111111111111001111111111000000111111111111100",
    "0111111111111100111100000000000001111000000000001111000001111100
0000111100000001111000000000001111111111110000001111111111110",
    "0111111111111100111100000000000001111000000000001111000001111100
0000111100000001111000000000001111000011110000000000011111110",
    "0000000001111000011110000000000001111000000000001111000000111100
0000011110000000111100000000000011110000011110000000000011111110",
    "0000000001111000011110000000000001111111111110001111000000111100
0000111100000001111000000000001111000000111100111111111111110",
    "0000000001111000011110000000000001111111111110001111000000111100
0000111100000001111111111111100111100000011110001111111111100",
    "0000000001111000011110000000000001111111111110001111000000111100
0000111100000001111111111111100111100000011110001111111111000",
    "0000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000"
  );

  signal pointer: array_type_16x16 :=
  ( "0000000000000000",
    "0001100000000000",
    "0001110000000000",
    "0001111100000000",
    "0001111110000000",
    "0001111111000000",
    "0001111111100000",
    "0001111111110000",
    "0001111111110000",
    "0001111111100000",
    "0001111111000000",
    "0001111110000000",
    "0001111100000000",
    "0001110000000000",
    "0001100000000000",
    "0000000000000000"
  );
```

begin

----------------------------------bomberman
logo--

sprite_bombermanlogo0(0) <=
"00000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000";

sprite_bombermanlogo0(1) <=
"00000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000";

sprite_bombermanlogo0(2) <=
"00000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000";

sprite_bombermanlogo0(3) <=
"00000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000";

sprite_bombermanlogo0(4) <=
"00000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000";

sprite_bombermanlogo0(5) <=
"00000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000";

sprite_bombermanlogo0(6) <=
"00000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000";

sprite_bombermanlogo0(7) <=
"00000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000";

sprite_bombermanlogo0(8) <=
"00000000000000000000000000000000000000000000000000000000000000000000

```
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(9) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(10) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(11) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(12) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(13) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(14) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(15) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000100000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(16) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(17) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000100000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
```

```
sprite_bombermanlogo0(18) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000001000010000
00000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(19) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000100000
00000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(20) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(21) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000100
00000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(22) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(23) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000001000000000000
00000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(24) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000001111000100000
00000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(25) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000100000
00000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(26) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000001000001000000
00000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(27) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
```

```
000000000000000000000000000000000000000000000000000000000100000000000
000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(28) <=
"000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000100000000000
000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(29) <=
"000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(30) <=
"000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000001000000
000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(31) <=
"000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(32) <=
"000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000011000000000000
000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(33) <=
"000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000111111011000000000
000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(34) <=
"000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000011111111111100000000
000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(35) <=
"000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000111011111111111000000
000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(36) <=
"000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000110001111111111111000000
000000000000000000000000000000000000000000000000000000000000000000000";
```

```
sprite_bombermanlogo0(37) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000011000011111111111111110000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(38) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000111001111111111111111111000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(39) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000001111111111111101111111111111111111111000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(40) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000011111111111111111111111111111111111111111111000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(41) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000111111111111111111111111111111111111111111111111000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(42) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000011111111111111111111111111111111111111111111111111100
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(43) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000001111111111101111111111111111111111111111111111111111100
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(44) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000001111111111000001111111111111111111111111111111111111111100
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(45) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000111111111000000111111111111111111111111111111111111111111110
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(46) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
```

```
000000000000111111110000000111111111111111111111111111111111111111110
000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(47) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000011111110000000011111111111111111111111111111111111111111100
000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(48) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000111111000000000111111111111111111111111111111111111111111100
000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(49) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000011111110000000011111111111111111111111111111111111111111111100
000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(50) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000111111000000000111111111111111111111111111111111111111111111100
000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(51) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000001111110000000011111111111111111111111111111111111111111111111100
000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(52) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000011111100000000111111111111111111111111111111111111111111111111100
000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(53) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000111110000000011111111111111111111111111111111111111111111111111110
000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(54) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
001111100000000011111111111111111111111111111111111111111111111111111
000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(55) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
011111000000000111111111111111111111111111111111111111111111111111111
100000000000000000000000000000000000000000000000000000000000000000";
```

```
sprite_bombermanlogo0(56) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000
11111000000000111111111111111111111111111111111111111111111111111111111111
11000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(57) <=
"00000000000000000000000000000000000000000000000000000000000000000000000001
11111000000000111111111111111111111111111111111111111111111111111111111111
11100000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(58) <=
"00000000000000000000000000000000000000000000000000000000000000000000000011
11111000000111110011111111111111111001000111100000000000000011111111111111
11111100000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(59) <=
"00000000000000000000000000000000000000000000000000000000000000000000011111
11111111001111111000000111111110000000000001100000000000000000011110000000
00001111111100000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(60) <=
"00000000000000000000000000000000000000000000000000000000000000000001111000
00000111111100000000000011111100000000000001100000000000000000001110000000
00000000001110000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(61) <=
"00000000000000000000000000000000000000000000000000000000000000000111000000
00000001111000000000000111111000000000000011100000000000000000011100000000
00000000000111111111000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(62) <=
"00000000000000000000000000000000000000000000011111111000000011000000000
00000000001111000000000001111000000000000001110000000001110000000110000000
00000000000011110111111000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(63) <=
"00000000000000000000000000000000000000000111111111111110011100000000000
00000000001111000000000000000000000000000011000000001111100000011000000000
00000000000011000000111110000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(64) <=
"00000000000000000000000000000000000000011111100000000001111110000000000000
00000000000111000000000000000000000000000011000000001111100000011000000000
00000000000001100000000000111100000000000000000000000000000000000000000000";
sprite_bombermanlogo0(65) <=
"00000000000000000000000000000000000011110000000000000011100000000000
```

0000000000000111000000000000000000000000000011000000001111100000001100
000000000000001100000000000000011100000000000000000000000000000000";
sprite_bombermanlogo0(66) <=
"0000000000000000000000000000001111000000000000000000000011100000000000
0000000000000111000000000000000000000000000011000000001111100000001100
0000000000000011000000000000000011000000000000000000000000000000";
sprite_bombermanlogo0(67) <=
"000000000000000000000000000001111000000000000000000000000011000000000000
000000000000001100000000000000000000000000001100000000111000000001100
00011100000000110000000000000000001100000000000000000000000000000";
sprite_bombermanlogo0(68) <=
"000000000000000000000000000011110000000000000000000000000001100000000000
0000000000000011100000000000000000000000000110000000000000000000011000
000111111111110000000000000000000110000000000000000000000000000";
sprite_bombermanlogo0(69) <=
"00000000000000000000000001111000000000000000000000000000000111000000000
000000000000000110000000000000000000000000011000000000000000000110000
00000011111111000000000001111000000001000000000000000000000000000";
sprite_bombermanlogo0(70) <=
"0000000000000000000000001110000000000000000000000000000000001100000000
000000000000000011100000000000000000000000001000000000000000000110000
000000000000111000000000111110000001100000000000000000000000000";
sprite_bombermanlogo0(71) <=
"000000000000000000000011100000000000000000000000000000000011000000000
000000111100000000110000000000000000000000000100000000000000001100000
0000000000000110000000011111100000011000000000000000000000000000";
sprite_bombermanlogo0(72) <=
"0000000000000000000001100000000000000000000111100000000000011000000000
00000111111000000110000000000000000000000000100000000000000000110000
00000000000001100000000111110000001100000000000000000000000000";
sprite_bombermanlogo0(73) <=
"0000000000000000000011000000000000000000111111000000000000011000000000
000001111110000001100000000000000000000000000110000000000000000011000
00000000000000110000000011110000000110000000000000000000000000";
sprite_bombermanlogo0(74) <=
"0000000000000000000010000000000000000000111111000000000000011000000000
0000011111100000001000000000000000000000000011000000000000000001100
000000000000110000000000000000000011000000000000000000000000000";

```
sprite_bombermanlogo0(75) <=
"00000000000000000001100000000000000000000111111000000000011000000000
00000111111000000010000000000000000000000000011000000000110000000110000
00011100000011100000000000000000001110000000000000000000000000";
sprite_bombermanlogo0(76) <=
"00000000000000000001100000000000000000000111111000000000010000000000
00000011110000000010000000000000000000000000011000000001111000000100
00011111111111000000000000000000001111000000000000000000000000";
sprite_bombermanlogo0(77) <=
"00000000000000000001100000000000000000000111100000000000010000000000
00000000000000000001000000000000000000000000011000000001111100000110
00000000111111000000000000000000111111000000000000000000000000";
sprite_bombermanlogo0(78) <=
"00000000000000000001000000000000000000000010000000000011000000000
00000000000000000001000000000001100000000000011000000001111100000100
00000000000011000000000000001111111100000000000000000000000000";
sprite_bombermanlogo0(79) <=
"00000000000000000001100000000000000000000000000000000011111000000
00000000000000000001000000000011100000000000011000000001111100000110
00000000000011000000000000001111111100000000000000000000000000";
sprite_bombermanlogo0(80) <=
"00000000000000000001100000000000000000000000000000000111110000
00000000000000000110011110000111000000000001100000000011100000011000
00000000000011000000000000001111111100000000000000000000000000";
sprite_bombermanlogo0(81) <=
"00000000000000000001000000000000000000000000000000000000111100
00000000000000000110011110001111100000000000100000000000000000011000
00000000000001000011000000001111111000000000000000000000000000";
sprite_bombermanlogo0(82) <=
"00000000000000000001100000000000000000000000000000000000001110
00000000000000000110011111111111100000000000100000000000000000110000
00000000000010000111000000011100000000000000000000000000000000";
sprite_bombermanlogo0(83) <=
"00000000000000000001000000000000000000000000000000000000000011
00000000000000000100011111111111000000000001100000000000000001100000
00000000000110001111000000011000000000000000000000000000000000";
sprite_bombermanlogo0(84) <=
"00000000000000000000010000000000000000000000000000000000000001
```

```
10000000000000001100001111111111100000000000110000000000000001111000000000000000011000011111000000011100000000000000000000000000000000";
sprite_bombermanlogo0(85) <=
"00000000000000000000000100000000000000000000000000000000000000000000000110000000000000011000011111111111100000000011100000001111111111111000000000001100001111100000001110000000000000000000000000000000";
sprite_bombermanlogo0(86) <=
"00000000000000000000000110000000000000000000000000000000000000000000000010000000000000110000111111111111111111111111111111111111111111111111111111110001111110000000111000000000000000000000000000000";
sprite_bombermanlogo0(87) <=
"00000000000000000000000110000000000000000000000000000000000000000000000011000000000000110000111111111111111111111111111111111111111111111111111111111111111100000001110000000000000000000000000000";
sprite_bombermanlogo0(88) <=
"00000000000000000000000010000000000000000000000000000000000000000000000011000000000001111111111111111111111111111111111111111111111111111111111111111100000011100000000000000000000000000000";
sprite_bombermanlogo0(89) <=
"00000000000000000000000011000000000000000000000000000111100000000000011000000000001111111111111111111111111111111111111111111111111111111111111111100000011100000000000000000000000000000";
sprite_bombermanlogo0(90) <=
"00000000000000000000000010000000000000000000000000001111100000000000011000000000011111111111111111111111111111111111111111111111111111111111111111000111111110000000000000000000000000000";
sprite_bombermanlogo0(91) <=
"00000000000000000000000011000000000000000000000000001111100000000000011000000001111111111111111111111111111111111111111111111111111111111111111110000011111111000000000000000000000000000";
sprite_bombermanlogo0(92) <=
"00000000000000000000000010000000000000000000000000001111100000000000011000000011111111111111111111111111111111111111111111111111111111111111111110000011111111000000000000000000000000000";
sprite_bombermanlogo0(93) <=
"00000000000000000000000011000000000000000000000000001111100000000000011000001111111111111111111111111111111111111111111111111111111111111111111110001111111111000000000000000000000000000";
```

```
sprite_bombermanlogo0(94) <=
"00000000000000000000000000010000000000000000000000000111100000000000
11001111111111111111111111111111110000111111111111000111111111111111110
00000011111111111110000111111111111100000000000000000000";
sprite_bombermanlogo0(95) <=
"00000000000000000000000000000100000000000000000000000000000000000001
11111111111111111111111111111110000000111111110000000111111111111000
00000011111110000110000001110000000110000000000000000000";
sprite_bombermanlogo0(96) <=
"00000000000000000000000000000100000000000000000000000000000000000001
11111111111111111111111111111110000000011111111000000001111111111110000
00000000111111000000110000011000000001100000000000000000000";
sprite_bombermanlogo0(97) <=
"00000000000000000000000000000100000000000000000000000000000000000011
11111111111111111111111111111110000000000011111000000000011111111100000000
00000000111110000000010000010000000001100000000000000000000";
sprite_bombermanlogo0(98) <=
"00000000000000000000000000000110000000000000000000000000000000000111
11111111111111111111111111111110000000000001111000000000011111111100000000
00000000111110000000011000110000000001111000000000000000000";
sprite_bombermanlogo0(99) <=
"00000000000000000000000000000100000000000000000000000000000000000111
11111111111111111111111111111110000000000000000000000000001111111100000000
00000000111100000000001000100000000011111000000000000000000";
sprite_bombermanlogo0(100) <=
"00000000000000000000000000000110000000000000000000000000000000001111
11111111111111111111111111111000000000000000000000000000001111111100000011
10000000111000000000001101100000000011111000000000000000000";
sprite_bombermanlogo0(101) <=
"00000000000000000000000000000010000000000000000000000000000000011111
11111111111111111111111111100000000000000000000000000000001111110000000111
11000000111000000000001110000000000111110000000000000000000";
sprite_bombermanlogo0(102) <=
"00000000000000000000000000000011000000000000000000000000000000011111111
11111111111111111111111100000000000000000000000000000001111110000000011111
10000001110000000000001110000000001111100000000000000000000";
sprite_bombermanlogo0(103) <=
"00000000000000000000000000000010000000000000000000000000000000111111111
```

11111111111111111111110000000000000000000000000000011111000000001111
10000001110000000000000000000000001111100000000000000000";
sprite_bombermanlogo0(104) <=
"00000000000000000000000000000000100000000000000000000011111111111
11111111111111111111110000000000000000000000000000011111000000001111
10000011100000000000000000000000011111000000000000000000";
sprite_bombermanlogo0(105) <=
"00000000000000000000000000000000100000000000000000000111111111111
11111111111111111111100000000000000000000000000000111110000000000001
00000001110000000000000000000000011111000000000000000000";
sprite_bombermanlogo0(106) <=
"00000000000000000000000000000000100000000000000000011111111111111
11111111111111111111000000000000000000000000000001111000000000000000
00000001100000000000000000000000011111000000000000000000";
sprite_bombermanlogo0(107) <=
"00000000000000000000000000000000110000000000000000111111111111111
11111111111111111111000000000000000000000000000001111000000000000000
00000011100000000000000000000000011111000000000000000000";
sprite_bombermanlogo0(108) <=
"00000000000000000000000000000000100000000000000011111111111111111
11111111111111111111000000000000000000000000000001111000000000000000
00000011000000000000000000000000011111000000000000000000";
sprite_bombermanlogo0(109) <=
"00000000000000000000000000000000110000000000001111111111111111111
11111111111111111111000000000000000000000000000001111000000000000000
00000011000000000000000000000000011111000000000000000000";
sprite_bombermanlogo0(110) <=
"00000000000000000000000000000000100000000000111111111111111111111
11111111111111111111000000000001110000011100000000000111000000001110000
00000110000000000110000000000000011111000000000000000000";
sprite_bombermanlogo0(111) <=
"00000000000000000000000000000000100000001111111111110001111111111
11111111111111111111000000000011110000111100000000001110000000011110000
00001100000000011110000000000011111000000000000000000000";
sprite_bombermanlogo0(112) <=
"00000000000000000000000000000000110011111111111111000001111111111
11111111111111111111000000000011110000111100000000001100000000011111000000
00110000000001111100000000001111100000000000000000000000";

```
sprite_bombermanlogo0(113) <=
"00000000000000000000000000000000000000001111111111111000000001111111
11111111111111100000000001111110001111110000000001110000000001111100000
00011000000000111111100000000011111100000000000000000000000000";
sprite_bombermanlogo0(114) <=
"00000000000000000000000000000000000000001111111111110000000001111111
11111111111111000000000011111110011111110000000001100000000111111000000
00111000000000111111100000000011111100000000000000000000000000";
sprite_bombermanlogo0(115) <=
"00000000000000000000000000000000000000001111111100000000000000111111
11111111111111000000011111111111111111111111111111111111111111111111111
11111111111111111111111111111110000000000000000000000000";
sprite_bombermanlogo0(116) <=
"00000000000000000000000000000000000000001111100000000000000000111111
11111111111111111111111111111111111111111111111111111111111111111111111
11111111111111100011111111111100000000000000000000000000";
sprite_bombermanlogo0(117) <=
"00000000000000000000000000000000000000000000000000000000000000001111
11111111111111111111111111111111111111111111111111111111111111111111111
11111111111111100001111111111100000000000000000000000000";
sprite_bombermanlogo0(118) <=
"00000000000000000000000000000000000000000000000000000000000000000111
11111111111111111111111111111111111111111111111111111111111111111111111
11111111111111100000111111111000000000000000000000000000";
sprite_bombermanlogo0(119) <=
"00000000000000000000000000000000000000000000000000000000000000000011
11111111111111111111111111111111111111111111111111111111111111111111111
11110011111111100000001111111000000000000000000000000000";
sprite_bombermanlogo0(120) <=
"00000000000000000000000000000000000000000000000000000000000000000011
11111111111111111111111111111111111111111111111111111111111111111111111
11100000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(121) <=
"00000000000000000000000000000000000000000000000000000000000000000001
11111111111111111111111111111111111111111111111111111111111111111111111
11000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(122) <=
"00000000000000000000000000000000000000000000000000000000000000000000
```

```
11111111111111111111111111111111111111111111111111111111111111111111
10000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(123) <=
"00000000000000000000000000000000000000000000000000000000000000000000
01111111111111111111111111111111111111111111111111111111111111111111
00000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(124) <=
"00000000000000000000000000000000000000000000000000000000000000000000
00111111111111111111111111111111111111111111111111111111111111111110
00000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(125) <=
"00000000000000000000000000000000000000000000000000000000000000000000
00111111111111111111111111111111111111111111111111111111111111111100
00000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(126) <=
"00000000000000000000000000000000000000000000000000000000000000000000
00001111111111111111111111111111111111111111111111111111111111111000
00000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(127) <=
"00000000000000000000000000000000000000000000000000000000000000000000
00000111111111111111111111111111111111111111111111111111111111111000
00000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(128) <=
"00000000000000000000000000000000000000000000000000000000000000000000
00000011111111111111111111111111111111111111111111111111111111110000
00000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(129) <=
"00000000000000000000000000000000000000000000000000000000000000000000
00000001111111111111111111111111111111111111111111111111111111100000
00000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(130) <=
"00000000000000000000000000000000000000000000000000000000000000000000
00000000111111111111111111111111111111111111111111111111111110000000
00000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(131) <=
"00000000000000000000000000000000000000000000000000000000000000000000
00000000011111111111111111111111111111111111111111111111111100000000
00000000000000000000000000000000000000000000000000000000";
```

```
sprite_bombermanlogo0(132) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000
00000000001111111111111111111111111111111111111111111111111111000000000
00000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(133) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000
00000000000011111111111111111111111111111111111111111111110000000000
00000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(134) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000
00000000000001111111111111111111111111111111111111111111000000000000
00000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(135) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000011111111111111111111111111111111111111100000000000000
00000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(136) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000001111111111111111111111111111111111110000000000000000
00000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(137) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000011111111111111111111111111111110000000000000000000
00000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(138) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000001111111111111111111111110000000000000000000
00000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(139) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000001111111111111000000000000000000000000000
00000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(140) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(141) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000
```

000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(142) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(143) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(144) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(145) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(146) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(147) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(148) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(149) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(150) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";

```
sprite_bombermanlogo0(151) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(152) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(153) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(154) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(155) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(156) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(157) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(158) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(159) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(160) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
```

00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(161) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(162) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(163) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000001000000000100000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(164) <=
"00000000000000000000000000000000000011111000001000001000000000100000
11000000001000000000100000000000000000000000011000000011000011000010
00000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(165) <=
"00000000000000000000000000000000000010000000001000001000000000100000
11000000000000000001000000000000000000000000011000000001000011000110
00000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(166) <=
"00000000000000000000000000000000000110000000001000001000000000100000
11000111001000111000111110000000000000000000011000000010001110001000
11100010111000011110000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(167) <=
"00000000000000000000000000000000000100000000001000001000000000100000
11001000001001100100110011000000000000000000011000000001100101100100
00001001100110010001100000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(168) <=
"00000000000000000000000000000000000100000000001111111000000000111111
10011000010010001101000110000000000000000000011000000000100101100100
00010011001100100011000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(169) <=
"00000000000000000000000000000000000100000000001000001000000000100000
11000111001001111110100011000000000000000000011000000000101100101100
11110010001101100011000000000000000000000000000000000000000000000000";

```
sprite_bombermanlogo0(170) <=
"00000000000000000000000000000000011000000000100001000000000100000
11000001001001000000100011000000000000000000011000000000111000111000
11001001000110110001100000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(171) <=
"00000000000000000000000000000000010000000001000001000000000100000
11000001001001000000100011000000000000000000010000000000111000111000
10001001100110010001100000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(172) <=
"00000000000000000000000000000000011111011001000001001100000100000
11001111001000111100100011000000000000000000111000100000001100001100011
11110011001100111111000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(173) <=
"00000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000001000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(174) <=
"00000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000001000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(175) <=
"00000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000
00000000000000011110000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(176) <=
"00000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(177) <=
"00000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(178) <=
"00000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(179) <=
"00000000000000000000000000000000000000000000000000000000000000000000000
```

```
0000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(180) <=
"000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(181) <=
"000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(182) <=
"000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(183) <=
"000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(184) <=
"000000000000000000000000000000000000000000000000000000000000000000000
0010000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(185) <=
"00000000000000000000000000000000110110000011000001110000000000111110
0100000000000000000000000000000000000001110000011000000001100011000
0110000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(186) <=
"0000000000000000000000000000000011000000000110000011100000000000100000
0010000000000000000000000000000000000001110000011000000000110001110
0010000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(187) <=
"0000000000000000000000000000000011000000000111000011100000000001000000
001111100011110011100111110001111100000000011111000111000000000100011100
0100111110001111100011111000000000000000000000000000000000000000";
sprite_bombermanlogo0(188) <=
"0000000000000000000000000000000011000000000101000101100000000001000000
001000100110010011000110010011001100000000011010001010000000001001101 0
0110000011001100100110011000000000000000000000000000000000000000";
```

sprite_bombermanlogo0(189) <=
"00000000000000000000000000000000011100000101100101100000000100000
00100010010001101000010001101100010000000011011011010000000011010010
01000000110010001101100010000000000000000000000000000000000000000";
sprite_bombermanlogo0(190) <=
"00000000000000000000000000000000011000001001011011000000010000000
00100010011111001000010001101000010000000011001010010000000011010011
01000111110010001101000010000000000000000000000000000000000000000";
sprite_bombermanlogo0(191) <=
"00000000000000000000000000000000011000001001110011000000011000000
00100010010000001000010001101000010000000011001110010000000001110001
11001100110010001101000010000000000000000000000000000000000000000";
sprite_bombermanlogo0(192) <=
"00000000000000000000000000000000011011001000110011001000000110000
00100010011000001000010001101100110000000011001100010001000001100001
10001100110010001101100110000000000000000000000000000000000000000";
sprite_bombermanlogo0(193) <=
"00000000000000000000000000000000011111001100100010001000100000011111 0
01000100011110010000100010001110100000000100010001001100000001000011
00001111100100010001110100000000000000000000000000000000000000000";
sprite_bombermanlogo0(194) <=
"00000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000010000000000000000000000000000000000000
00000000000000000000000010000000000000000000000000000000000000000";
sprite_bombermanlogo0(195) <=
"00000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000001100000000000000000000000000000000000000
00000000000000000000001100000000000000000000000000000000000000000";
sprite_bombermanlogo0(196) <=
"00000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000001111000000000000000000000000000000000000000
00000000000000000001111000000000000000000000000000000000000000000";
sprite_bombermanlogo0(197) <=
"00000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(198) <=
"00000000000000000000000000000000000000000000000000000000000000000000000

00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo0(199) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";

sprite_bombermanlogo1(0) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(1) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(2) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(3) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(4) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000010000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(5) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000100000010000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(6) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000110000110000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(7) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000

0000000000000000000000000000000000000000000000000000001100001110001110
00000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(8) <=
"000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000110001111001110
00000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(9) <=
"000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000011100111111110
00110000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(10) <=
"000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000011111111111111
110000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(11) <=
"000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000011111111111111
110000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(12) <=
"000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000011111111111111
110000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(13) <=
"000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000111111111111111
100000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(14) <=
"000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000011111111111111111
110000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(15) <=
"000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000111111111001111111
111111000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(16) <=
"000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000111111111011111111
111110000000000000000000000000000000000000000000000000000000000";

```
sprite_bombermanlogo1(17) <=
"0000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000111110101011111111
111100000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(18) <=
"0000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000001111110100011011111
111000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(19) <=
"0000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000011111111001001010011
11110000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(20) <=
"0000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000011111111110010011001111
111100000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(21) <=
"0000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000111111001001000011
11111100000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(22) <=
"0000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000001111101010001111
1111111100000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(23) <=
"0000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000011110111100111111
111111110000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(24) <=
"0000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000001111000000101111
11100000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(25) <=
"0000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000001111100110111111
100000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(26) <=
"0000000000000000000000000000000000000000000000000000000000000000000000000000000
```

```
00000000000000000000000000000000000000000000000000111110110000111111
1000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(27) <=
"0000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000111110000111111111
1000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(28) <=
"0000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000011101111111
11000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(29) <=
"0000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000100011111000
00000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(30) <=
"0000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000001111100111000
00000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(31) <=
"0000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000001100011011000
00000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(32) <=
"0000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000011101011000
00000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(33) <=
"0000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000100000001001001000
00000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(34) <=
"0000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000100000000000001000000
00000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(35) <=
"0000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000010001000000000000100000
00000000000000000000000000000000000000000000000000000000000000";
```

```
sprite_bombermanlogo1(36) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000010000100000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(37) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000100100000000000000001000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(38) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000001000000000000000000000000000010000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(39) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000001110000000000000001000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(40) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000001000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(41) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000100000000000000000000000000000000000000000000000000000000000
10000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(42) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000010000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(43) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000001000000000001000000000000000000000000000000000000000000000000000
01000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(44) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000001000000000011000000000000000000000000000000000000000000000000000000
01000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(45) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
```

000000000000100000000010000010000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(46) <=
"00000000000000000000000000000000000000000000000000000000000000000000
000000000010000000001000001000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(47) <=
"00000000000000000000000000000000000000000000000000000000000000000000
000000000100000001000000000000000000000000000000000000000000000000000
001000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(48) <=
"00000000000000000000000000000000000000000000000000000000000000000000
000000001000000100000000100000000000000000000000000000000000000000000
001000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(49) <=
"00000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000
001000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(50) <=
"00000000000000000000000000000000000000000000000000000000000000000000
000000000000100000001000000000000000000000000000000000000000000000000
001000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(51) <=
"00000000000000000000000000000000000000000000000000000000000000000000
000010000000000000000000000000000000000000000000000000000000000000000
001000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(52) <=
"00000000000000000000000000000000000000000000000000000000000000000000
000100000000000000000000000000000000000000000000000000000000000000000
001000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(53) <=
"00000000000000000000000000000000000000000000000000000000000000000000
001000001000000000000000000000000000000000000000000000000000000000000
000100000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(54) <=
"00000000000000000000000000000000000000000000000000000000000000000000
010000010000000100000000000000000000000000000000000000000000000000000
000010000000000000000000000000000000000000000000000000000000000";

```
sprite_bombermanlogo1(55) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000
00000010000000100000000000000000000000000000000000000000000000000000000000
00000100000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(56) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000
00000010000000100000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(57) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000
00001000000010000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(58) <=
"00000000000000000000000000000000000000000000000000000000000000000000000100
00000100000000001100000000000000001101110000111111111111111000000000000
00000000110000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(59) <=
"00000000000000000000000000000000000000000000000000000000000000000000100000
00000000110000000111111000000001111111111100111111111111111110000111111
11000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(60) <=
"00000000000000000000000000000000000000000000000000000000000000000010000111
11111000000011111111111100000111111111111001111111111111111110001111111
11111110001000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(61) <=
"00000000000000000000000000000000000000000000000000000000000000001000111111
11111111000011111111111100000111111111111001111111111111111110001111111
11111111100000000110000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(62) <=
"00000000000000000000000000000000000000000000110000000001100001001111111111
11111111100001111111111100001111111111111001111111110011111110011111111
11111111100001000000110000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(63) <=
"00000000000000000000000000000000000000000110000000000000011000111111111111
11111111100001111111111111111111111111111001111111100000111111001111111
11111110100100001100000110000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(64) <=
"00000000000000000000000000000000000010000001111111110000001111111111
```

```
11111111111000111111111111111111111111111111001111111100000111101001011111
11111111000100000000110000100000000000000000000000000000";
sprite_bombermanlogo1(65) <=
"00000000000000000000000000000011000011111111111111110001111111111111
11111111111000111111111111111111111111111111001111111100000111111001010111
11000001001011011000011100010000000000000000000000000000";
sprite_bombermanlogo1(66) <=
"00000000000000000000000000000100001111111111111111111100011111111111
11111111111000111111111111111111111111111111001010111100000100101001011111
10000000100100000100000001100100000000000000000000000000";
sprite_bombermanlogo1(67) <=
"00000000000000000000000000001000011111111111111111111111001111111111
11111111111100111111111111111111111111111111001111111100010011110011111000
11111110010000000000000000001000000000000000000000000000";
sprite_bombermanlogo1(68) <=
"00000000000000000000000000001000011111111111111111111111001111111111
11111111111000111111111111111111111111111010010111111011101110100100011000
00000000100001000011110000000000000000000000000000000000";
sprite_bombermanlogo1(69) <=
"00000000000000000000000000001000011111111111111111111111001111111111
11111111111100111111111111111111111111111001011111111000100100100111011100
00000000100100000100001000001010000000000000000000000000";
sprite_bombermanlogo1(70) <=
"00000000000000000000000000001000111111111111111111111111001111111111
11111111111110000111111111111111111111111010111111111000010000110000001
00111000100000001000000000010000000000000000000000000000";
sprite_bombermanlogo1(71) <=
"00000000000000000000000000001000111111111111111111111111001111111111
11100001111111001001111111111111111111111010100011111111000000100010011000
00000001001000000000000010000000000000000000000000000000";
sprite_bombermanlogo1(72) <=
"00000000000000000000000000001001111111111111111111000011111111111001111111111111
11000000111101001011111111111111111111111010100011000000000100100011000
10000000100000000010000000000000000000000000000000000000";
sprite_bombermanlogo1(73) <=
"00000000000000000000000000011111111111111111111000000111111111100111111111111
01000000101111001010100111111111000111110100000011001000000010010000000
00000000010000000001000010000010010000000000000000000000";
```

```
sprite_bombermanlogo1(74) <=
"00000000000000000010111111111111111111110000001111111111001111111111011
01000000101110101000011010110010001101100100100101000000000000010010000
1000000000001000000000111000000100100000000000000000000000000";
sprite_bombermanlogo1(75) <=
"00000000000000000000111111111111111111110000001111111111001111111111111
010000001111001010011011010000101001011001001000010010011000010010001
0001111110001000000000000000000100010000000000000000000000000";
sprite_bombermanlogo1(76) <=
"00000000000000000000111111111111111111110000001111111101010101101110111
11110000010110001010100000000000001100001000000100010010000100000101000
10000000000010000000000000000001000010000000000000000000000000";
sprite_bombermanlogo1(77) <=
"00000000000000000000111111111111111111101000011111111101010100111110111
11011111010111010100000100100110000000000000001000000100000100001000000
1111110000000000000000000000110000001000000000000000000000000";
sprite_bombermanlogo1(78) <=
"000000000000000000101111111111111111111111111011111111110100110001100111
10000000011100101000000000001001000000000000010000001000001000010100000
000000001001000000000000010000000010000000000000000000000000";
sprite_bombermanlogo1(79) <=
"0000000000000000000001110011111111111110111111110111111010000011000001
10010011101100010101111000010001000000000000010000001000000000000001000
0000000001000000000000000100000000000000000000000000000000000";
sprite_bombermanlogo1(80) <=
"0000000000000000000001010111110111111111111001110111111011100000110000
100100001101000001000001000100010000000000000100000001000100001001000
0000000000001000010000000100000001000000000000000000000000000";
sprite_bombermanlogo1(81) <=
"000000000000000000000101001001111111110000110000001111111001110000100
000000000000000000100000010100000000000000001010000000011000000001000
00000000000101000000100000000000001000000000000000000000000000";
sprite_bombermanlogo1(82) <=
"000000000000000000000001000110011100000000000000000000000010000010001
00000000000010001000000000000000000000000000001010000000000000000100100
000000000000101001000100000010001000000000000000000000000000000";
sprite_bombermanlogo1(83) <=
"00000000000000000000101000010011000000000000000010000000000000000100
```

```
10000000000000001010010000000000000000000000001000000000000011001000
00000000000000010000010000001001000000000000000000000000000000";
sprite_bombermanlogo1(84) <=
"00000000000000000000010100000000000000001000000000000000000100010
00000000000000100100100000000000010000000010010000000000111000000000
00000000000100001000000000010000000000000000000000000000000000";
sprite_bombermanlogo1(85) <=
"00000000000000000000000110000000000000000000000000000000000000000010
01000000000000100000100000000000100011111100011111110000000000000011
11111111110010010000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(86) <=
"00000000000000000000000010000000000000000000000000000000000000000001
01000000000000001000100000000000000000000000000000000000000000000000
00000000000001010000001000000000100000000000000000000000000000";
sprite_bombermanlogo1(87) <=
"00000000000000000000000000000000000000000000000000000000000000000001
00000000000000100111110000000000000000000000000000000000000000000000
00000000000000000000000100000000100000000000000000000000000000";
sprite_bombermanlogo1(88) <=
"00000000000000000000000101000000000000000000000001111000000000001
00000000000001000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(89) <=
"00000000000000000000000000000000000000000000000010000100000000000
00100000000100000000000000000000000000000000000000000000000000000000
00000000000000000000000100001000000000000000000000000000000000000000";
sprite_bombermanlogo1(90) <=
"00000000000000000000000010100000000000000000000010000010000000000
00100000000100000000000000000000000000000000000000000000000000000000
00000000000000000000000100000000000000000000000000000000000000000000";
sprite_bombermanlogo1(91) <=
"00000000000000000000000000010000000000000000000010000010000000000
00100000001000000000000000000000000000000000000000000000000000000000
00000000000000000000100001000000001000000000000000000000000000000000";
sprite_bombermanlogo1(92) <=
"00000000000000000000000010100000000000000000000010000010000000001
00000000100000000000000000000000000000000000000000000000000000000000
00000000000000000001110000000000001110000000000000000000000000";
```

```
sprite_bombermanlogo1(93) <=
"000000000000000000000000000000000000000000000000100000000000000001
000001100000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000100000000000000000000000";
sprite_bombermanlogo1(94) <=
"000000000000000000000000000101000000000000000000000000100001000000001
0011000000000000000000000000000000011110000000000000001110000000000000
000111111100000000000000000000001000000000000000000000000000000000000";
sprite_bombermanlogo1(95) <=
"000000000000000000000000000001010000000000000000000000001111000000000000
0000000000000000000000000000000001111111000000000111111100000000000000
11111111100000000111100100001000111111100000000000000000000000000";
sprite_bombermanlogo1(96) <=
"000000000000000000000000000000100000000000000000000000000000000000010
000000000000000000000000000000001111111100000000111111110000000000000011
11111111110000001111110000000000111111100000000000000000000000000";
sprite_bombermanlogo1(97) <=
"000000000000000000000000000001010000000000000000000000000000000000100
0000000000000000000000000000000111111110100000111111111100000000001111
11111111110000010111111010001011111111100100000000000000000000";
sprite_bombermanlogo1(98) <=
"0000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000001111111111101000110111111110000000000011110
11111111110000011111001000000011111111100000000000000000000000000";
sprite_bombermanlogo1(99) <=
"000000000000000000000000000000101000000000000000000000000000000001000
0000000000000000000000000000011111111111111111100111111100000000001010011
1111111010000101111010101010101111100000001000000000000000000";
sprite_bombermanlogo1(100) <=
"000000000000000000000000000000000000000000000000000000000000000000010000
000000000000000000000000000111111111101111110111111111100000000111111100
011111111000110011111010010011111100100000100000000000000000000";
sprite_bombermanlogo1(101) <=
"000000000000000000000000000000001010000000000000000000000000000100000
000000000000000000000000000111111111111101111011111111100000011110010000
0010111100001010111110110001011100001000000000000000000000000";
sprite_bombermanlogo1(102) <=
"000000000000000000000000000000000000000000000000000000000000000000010000000
```

```
000000000000000000000000010101111111111011011111011110000001100110100
000101101000100001100000100010011100100000100000000000000000";
sprite_bombermanlogo1(103) <=
"000000000000000000000000000000001000000000000000000000000100000000
000000000000000000000000111001111111110110001011111011000000100011110 0
000100101000101000100000011100000000100000000000000000000000";
sprite_bombermanlogo1(104) <=
"000000000000000000000000000000001010000000000000000000010000000000
000000000000000000000001010100111001000110000110110010000001001000010
000010000000100110010000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(105) <=
"000000000000000000000000000000001000000000000000000001000000000000
000000000000000000000010001000000000000000000000000010000010001000101
101100101000100010000000000000000000100000100000000000000000";
sprite_bombermanlogo1(106) <=
"000000000000000000000000000000001010000000000000000100000000000000
000000000000000000000100001000000000000000001100000010000101000000010
110000001001000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(107) <=
"000000000000000000000000000000000000000000000000000100000000000000
000000000000000000001000000010000101000000000000000000010000000000001
000000010001000000000000000000000000100000100000000000000000000000";
sprite_bombermanlogo1(108) <=
"000000000000000000000000000000001010000000000001000000000000000000
000000000000000000010000000000000010000000000000100001000000000000
000000010010001000000000000000000000100000100000000000000000000000";
sprite_bombermanlogo1(109) <=
"000000000000000000000000000000000000000000000000100000000000000000
000000000000000000010000000001110000001110000000000100010000000011100
000000010010001000011000000000000100000000000000000000000000000000";
sprite_bombermanlogo1(110) <=
"000000000000000000000000000000001010000000011000000000000000000000
000000000000000000000000000000010001000010001000000000100000000000100000
000000100101000000100100000000000100000100000000000000000000000000";
sprite_bombermanlogo1(111) <=
"000000000000000000000000000000001010000010000000000001010000000
000000000000000001000000001000010001000010000000010001000000010000010
000000100000000001000010000000000000000000000000000000000000000000";
```

```
sprite_bombermanlogo1(112) <=
"00000000000000000000000000000000000010011000000000000100000000000
00000000000000001000000001000001001000001000000001001000000010000010
00000000100000000100000100000000100000100000000000000000000000";
sprite_bombermanlogo1(113) <=
"00000000000000000000000000000000000010000000000000100000010000000
00000000000000000000000010000001010000001000000000010000000100000010
00000100100000000000000000000000100000000000000000000000000000";
sprite_bombermanlogo1(114) <=
"00000000000000000000000000000000000010000000000001000000000000000
00000000000000010000000100000001100000001000000010001000000100000010
00011000101110011000000011011111000000100000000000000000000000";
sprite_bombermanlogo1(115) <=
"00000000000000000000000000000000000010000000011000000000010000000
00000000000000011111111000000000000000000000000000000000000000000000
00000000000000000000000000000000000010000000000000000000000000";
sprite_bombermanlogo1(116) <=
"00000000000000000000000000000000000010000010000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000010000000000000000000000000000000000000000";
sprite_bombermanlogo1(117) <=
"00000000000000000000000000000000000011000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000100010000000001000000000000000000000000000";
sprite_bombermanlogo1(118) <=
"00000000000000000000000000000000000000000000000000000000000001000
00000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000010000000010000000000000000000000000000";
sprite_bombermanlogo1(119) <=
"00000000000000000000000000000000000000000000000000000000000100
00000000000000000000000000000000000000000000000000000000000000000000
00000000010000000000000001000000100000000000000000000000000000";
sprite_bombermanlogo1(120) <=
"00000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(121) <=
"00000000000000000000000000000000000000000000000000000000000000000000
```

00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(122) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000001
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000010000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(123) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
10000000000000000000000000000000000000000000000000000000000000000000000000000000
00000010000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(124) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
01000000000000000000000000000000000000000000000000000000000000000000000000000000
00001000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(125) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00010000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(126) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00010000000000000000000000000000000000000000000000000000000000000000000000000000
00100000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(127) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00001000000000000000000000000000000000000000000000000000000000000000000000000000
01000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(128) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000100000000000000000000000000000000000000000000000000000000000000000000000000
10000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(129) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000010000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(130) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000100
00000000000000000000000000000000000000000000000000000000000000000000000000000000";

sprite_bombermanlogo1(131) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000010000000000000000000000000000000000000000000000000000000000000000010000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(132) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(133) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000010000000000000000000000000000000000000000000000000000000000100000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(134) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000100000000000000000000000000000000000000000000000000000010000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(135) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000010000000000000000000000000000000000000000000000000000100000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(136) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000001000000000000000000000000000000000000000000000000001000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(137) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000010000000000000000000000000000000000000000000000010000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(138) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000010000000000000000000000000000000000000000000011000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(139) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000011000000000000000000000000000000000000000001110000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(140) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000

000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(141) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(142) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(143) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(144) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(145) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(146) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(147) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(148) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(149) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";

```
sprite_bombermanlogo1(150) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(151) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(152) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(153) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(154) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(155) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(156) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(157) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(158) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(159) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
```

00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(160) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(161) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(162) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(163) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000001000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(164) <=
"00000000000000000000000000000000000011111000000000000000000000000000000000000000
11000000010000000000000000000000000000000011000000011000001000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(165) <=
"00000000000000000000000000000000000000000000000000000010000000000000000000000000
10000000000000000000000000000000000000000000011000000000000001000110
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(166) <=
"00000000000000000000000000000000000110000000000000000100000000000000000
10000111001000111000011110000000000000000000000110000000000011000010 0
01110001011100001111000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(167) <=
"00000000000000000000000000000000000000000000000000000000000000000000010000
00000000000001100000110011000000000000000000001100000000110000010000 0
0000100100011000000010000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(168) <=
"00000000000000000000000000000000000000000000000010101000000000010101
00000100000000000100000011000000000000000000001100000000000101100100
00000001100100000001100000000000000000000000000000000000000000000000";

sprite_bombermanlogo1(169) <=
"00000000000000000000000000000000000000000000000000010000000000000
10000001000000111000000011000000000000000000000110000000000011000011000
01110001000110110001100000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(170) <=
"00000000000000000000000000000000011000000000000000100000000000000
10000000000000000000000110000000000000000000011000000000111000111000
01000001000110110001100000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(171) <=
"00000000000000000000000000000000000000000000000000100000000000000
10000000000000000000000110000000000000000000000000000010100010100000
00000001000100000000100000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(172) <=
"00000000000000000000000000000000000011111010000000000010000000000000
10001111000000111100000011000000000000000000111000000000000100000010000
10110001100100010110100000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(173) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000010000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(174) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(175) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000111100000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(176) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(177) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(178) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000

```
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(179) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(180) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(181) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(182) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(183) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(184) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00100000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(185) <=
"00000000000000000000000000000000011011000000000000101000000000010001
00100000000000000000000000000000000000000010100000100000000001000000
00110000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(186) <=
"00000000000000000000000000000001000000000000000000010000000000000000
00100000000000000000000000000000000000000100000000000000110001010
00000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(187) <=
"00000000000000000000000000000001000000000001000000110000000000000000
00011010001111000110001111000111100000000111100011000000000000011000
00001111000011110001111000000000000000000000000000000000000000000000";
```

sprite_bombermanlogo1(188) <=
"00000000000000000000000000000000001000000000000001011000000000000000
0000000001100100010000100000110010000000000110000000100000000000011000
0110000011000100000110010000000000000000000000000000000000000000";
sprite_bombermanlogo1(189) <=
"00000000000000000000000000000000001000000001100001100000000000000000
0010000000000011000000000001000000000000000110000110100000000011010010
0100000010000000010010000000000000000000000000000000000000000000";
sprite_bombermanlogo1(190) <=
"00000000000000000000000000000000000100000000001101100000000000000000
0010000000111100000000000001000000000000000110010100100000000011010011
0000010111000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(191) <=
"0000000000000000000000000000000000011000000000110001100000000011000000
0010000000000000000000000100000000000000011001110010000000000110000
1100100010000000010000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(192) <=
"0000000000000000000000000000000000011011000000010011001000000010000
0010000000110000000000000000101000100000000011001000010001000000010000000
0000110010000000010110010000000000000000000000000000000000000000";
sprite_bombermanlogo1(193) <=
"0000000000000000000000000000000011111001100100010001000000000000111110
0100010001111001000010001000111000000000000100010001001100000000000011
0000111110010001000111000000000000000000000000000000000000000000";
sprite_bombermanlogo1(194) <=
"000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000010000000000000000000000000000000000000
0000000000000000000000010000000000000000000000000000000000000000";
sprite_bombermanlogo1(195) <=
"000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000011000000000000000000000000000000000000
0000000000000000000000011000000000000000000000000000000000000000";
sprite_bombermanlogo1(196) <=
"000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000001111100000000000000000000000000000000000
0000000000000000000111110000000000000000000000000000000000000000";
sprite_bombermanlogo1(197) <=
"000000000000000000000000000000000000000000000000000000000000000000000

```
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(198) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo1(199) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";


sprite_bombermanlogo2(0) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(1) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(2) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(3) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000011
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(4) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000100000101
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(5) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000001010000101
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(6) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
```

```
00000000000000000000000000000000000000000000000011000001001001001
00000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(7) <=
"00000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000010010000001010001
00000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(8) <=
"00000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000010010100001100011
00010000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(9) <=
"00000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000010001100000000011
11001000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(10) <=
"00000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000010000000000000000
00010000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(11) <=
"00000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000010000000000000000
00010000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(12) <=
"00000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000010000000000000000
00000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(13) <=
"00000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000011000000000000000
00100000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(14) <=
"00000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000010000000000000000
00011110000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(15) <=
"00000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000010000000010000000
00000010000000000000000000000000000000000000000000000000000000000";
```

sprite_bombermanlogo2(16) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000010000000
000000100000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(17) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000100000100010000000
000001000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(18) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000011000000100110000000
000010000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(19) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000001100000000110110001100
000010000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(20) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000110000000000110110011000
000001000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(21) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000001111000000110110111000
000000100000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(22) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000010000010101110000
000000001000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(23) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000010000000001100000
000000000100000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(24) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000010000000011000000
000111111100000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(25) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000

00000000000000000000000000000000000000000000000010000001100000000
00100000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(26) <=
"00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000111000000
00100000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(27) <=
"00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000010000011100000000
00100000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(28) <=
"00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000011110100001000000000
00100000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(29) <=
"00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000001011100000101
11100000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(30) <=
"00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000010000100
00000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(31) <=
"00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000011100100100
00000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(32) <=
"00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000110000010000100
00000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(33) <=
"00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000100000000000010100
00000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(34) <=
"00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000100000000000000001100
00000000000000000000000000000000000000000000000000000000000000000";

```
sprite_bombermanlogo2(35) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000010000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(36) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000010001100000000000000001000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(37) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000010001100000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(38) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000001111111111000010000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(39) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000001100000000000000000000000000000000000000000001
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(40) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000001000000000000000000000000000000000000000000000000
100000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(41) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000001000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(42) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000001000000000000000000000000000000000000000000000000000000
010000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(43) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000001000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(44) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
```

000000000000010000000000000111000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(45) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000001100100000000000000000000000000000000000000000000
001000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(46) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000100000000000000000000000000000000000000000000000000000000000000
001000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(47) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000001000001000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(48) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000010000000010000010000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(49) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000100000001000000100000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(50) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000001000000010000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(51) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000010000001000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(52) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000010000001000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(53) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000010000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";

sprite_bombermanlogo2(54) <=
"000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(55) <=
"000000000000000000000000000000000000000000000000000000000000000
1000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(56) <=
"000000000000000000000000000000000000000000000000000000000000001
0000000000000000000000000000000000000000000000000000000000000000
00000010000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(57) <=
"000000000000000000000000000000000000000000000000000000000000010
0000000000100000000000000000000000000000000000000000000000000000
00000001000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(58) <=
"000000000000000000000000000000000000000000000000000000000011000
0000001000100000000000000000000000000000000000000000000000000000
00000000001000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(59) <=
"000000000000000000000000000000000000000000000000000000001000000
0000000000000000000000000000000000000000000000000000000000000000
00000000000010000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(60) <=
"000000000000000000000000000000000000000000000000000000100000000
0000000000000000000000000000000000000000000000000000000000000000
0000000000000011111100000000000000000000000000000000000000";
sprite_bombermanlogo2(61) <=
"000000000000000000000000000000000000000011111111000001000000000
0000000000000000000000000000000000000000000000000000000000000000
00000000000000000000001100000000000000000000000000000000000";
sprite_bombermanlogo2(62) <=
"000000000000000000000000000000000000110000000000001001000000000
0000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000001000000000000000000000000000000000";
sprite_bombermanlogo2(63) <=
"000000000000000000000000000000000100000000000000000000000000000

```
00000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000010000111100000000100000000000000000000000000000000000";
sprite_bombermanlogo2(64) <=
"00000000000000000000000000000000100000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000100001
00000000000010001111111100000001000000000000000000000000000000000";
sprite_bombermanlogo2(65) <=
"00000000000000000000000000000001000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000001
01000000111110000100100111100000010000000000000000000000000000000";
sprite_bombermanlogo2(66) <=
"00000000000000000000000000000001000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000101000000000011010000 1
00000011111110000111110111111100000100000000000000000000000000000";
sprite_bombermanlogo2(67) <=
"00000000000000000000000000000001000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000001100000000
00000000000000011111111111111111000000000000000000000000000000000";
sprite_bombermanlogo2(68) <=
"00000000000000000000000000000001000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000100001000000100010001000011
10000000000000011110111100001111110010000000000000000000000000000";
sprite_bombermanlogo2(69) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000100000000111011000011 0
00100000000000110111110000001111100000000000000000000000000000000";
sprite_bombermanlogo2(70) <=
"00000000000000000000000000000001000000000000000000000000000000000000000000000
00000000000000000000010000000000000000000000000000000100000000001111000110 0
11111101100000001111111000000111110001000000000000000000000000000";
sprite_bombermanlogo2(71) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000011000000000000000000000000100011100000000111100011 0
11001111111100001111111000000011111001000000000000000000000000000";
sprite_bombermanlogo2(72) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000010000100000000000000000000000000100011100111111111100001 0
01101111111000111111100000011111100100000000000000000000000000000";
```

```
sprite_bombermanlogo2(73) <=
"00000000000000000001000000000000000000000000000000000000000000000000000000
00010000000010000000101011000000000111000001000111100110111111110000111
11111111111000111111100000011111000000000000000000000000000000";
sprite_bombermanlogo2(74) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000
10010000000100010001111001010011011100100110000110101111111111000011
11011111111100011111111100011111100000000000000000000000000000";
sprite_bombermanlogo2(75) <=
"00000000000000000001000000000000000000000000000000000000000000000000000000
00010000000000011000110010010111101011010011000011110110000011110000011
10000000000000011111111111111111000001000000000000000000000000";
sprite_bombermanlogo2(76) <=
"00000000000000000001000000000000000000000000000000000000010001001000100
00000000000100111000101111111111110011110111100011101100000011111000111
00000000000001111111111111111100000010000000000000000000000000";
sprite_bombermanlogo2(77) <=
"00000000000000000000000000000000000000001000000000000001000110000010
00001000001010001000111110110110011111111111000111111000000011110001111
00000000000011111111111111100000000000000000000000000000000000";
sprite_bombermanlogo2(78) <=
"00000000000000000000000000000000000000000000000000000010000011100110
00001111111100011000111111111100001111111111000111111000000011110001111
11111111000011111111111110000000000000000000000000000000000000";
sprite_bombermanlogo2(79) <=
"00000000000000000001000001100000000000010000000010000001000000001111
10011011000100111000100001111000011111111111000111111000000111110001111
11111111100011111111111110000000001000000000000000000000000000";
sprite_bombermanlogo2(80) <=
"00000000000000000000001010000010000000000001100010000010000000001111
11011011110010111000100000111000011111111111000111111000000111110000111
11111111110001111011111110000000000000000000000000000000000000";
sprite_bombermanlogo2(81) <=
"00000000000000000000100101101100000000011110011111000000011000000001111
11111111111111100010000001000000111111111110001111111100111111000111111
11111111000111000111111100000001000000000000000000000000000000";
sprite_bombermanlogo2(82) <=
"00000000000000000000000011100110001111111111111111111111101111100000011
```

```
11111111110111000110000000000000111111111110001111111111111111000011111111
11111111000110000011111100000110000000000000000000000000000";
sprite_bombermanlogo2(83) <=
"00000000000000000000000011110110011111111111111101111111111111111000011
11111111111111000110000000000000111111111110001111111111111100000111111111
11111110001100000111111000010000000000000000000000000000000";
sprite_bombermanlogo2(84) <=
"00000000000000000000000011111111111111111011111111111111111111011100011
11111111111100001100000000000000111111111000011111111110000000111111111111
11111000110000001111110000100000000000000000000000000000000";
sprite_bombermanlogo2(85) <=
"00000000000000000000010001111111111111111111111111111111111111100001
11111111111000111000000000000001110000000000000000000000000000000000000
00000000001100000011111100010000000000000000000000000000000";
sprite_bombermanlogo2(86) <=
"00000000000000000000000011111111111111111111111111111111111111110001
11111111111000111000000000000000000000000000000000000000000000000000000
00000000001000000011111100000000000000000000000000000000000";
sprite_bombermanlogo2(87) <=
"00000000000000000000010011111111111111111111111111111111111111110001
11111111110000000000000000000000000000000000000000000000000000000000000
00000000000000000000111111000000000000000000000000000000000";
sprite_bombermanlogo2(88) <=
"00000000000000000000000011111111111111111111111110000111111111100
11111111110000000000000000000000000000000000000000000000000000000000000
00000000000000000000111111000010000000000000000000000000000";
sprite_bombermanlogo2(89) <=
"00000000000000000000010011111111111111111111111100000111111111100
01111111110000000000000000000000000000000000000000000000000000000000000
00000000000000000000111100001000000000000000000000000000000";
sprite_bombermanlogo2(90) <=
"00000000000000000000000011111111111111111111110000000011111111100
01111111100000000000000000000000000000000000000000000000000000000000000
00000000000000000011000000000010000000000000000000000000000";
sprite_bombermanlogo2(91) <=
"00000000000000000000000010001111111111111111111110000000011111111100
01111111000000000000000000000000000000000000000000000000000000000000000
00000000000000000100000000000000000000000000000000000000000";
```

```
sprite_bombermanlogo2(92) <=
"0000000000000000000000000001111111111111111111111000000001111111000
1111110000000000000000000000000000000000000000000000000000000000
0000000000000000000010010000000000000111000000000000000000000000";
sprite_bombermanlogo2(93) <=
"0000000000000000000000000100111111111111111111111100000001111111110000
1110000000000000000000000000000000000000000000000000000000000000000
00000000000000000000010010000000000000000000000000000000000000";
sprite_bombermanlogo2(94) <=
"00000000000000000000000000000111111111111111111111100000011111111000
00000000000000000000000000000000000000000000000000000000000000000
000000000000000000000010000000000000000010000000000000000000000";
sprite_bombermanlogo2(95) <=
"000000000000000000000000000000111111111111111111111000011111111000
00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000100000000000000100000000000000000000000";
sprite_bombermanlogo2(96) <=
"0000000000000000000000000000100111111111111111111111111111111111110000
00000000000000000000000000000000000000000000000000000000000000000
000000000000000000000001000100000000000001000000000000000000000";
sprite_bombermanlogo2(97) <=
"0000000000000000000000000000000111111111111111111111111111111111100000
000000000000000000000000000000000000010000000000000000000000000000
0000000000000001000000000000000000000000001000000000000000000000";
sprite_bombermanlogo2(98) <=
"00000000000000000000000000001001111111111111111111111111111111111100000
00000000000000000000000000000000000000100000010000000000000000000010
000000000000000000011000101000000000000000001000000000000000000";
sprite_bombermanlogo2(99) <=
"00000000000000000000000000000000011111111111111111111111111111111000000
00000000000000000000000000000000000000000001100000000000000000101100
0000000100000001000010100000000100000110000000000000000000000000";
sprite_bombermanlogo2(100) <=
"0000000000000000000000000000010011111111111111111111111111111111110000000
0000000000000000000000000000000000001000000100000000000000000000000000
00000000000000110000010000000000000110000000000000000000000000";
sprite_bombermanlogo2(101) <=
"000000000000000000000000000000000011111111111111111111111111111100000000
```

00000000000000000000000000000000000010000100000000000000000110000
00010000000010100000100000010001111000000100000000000000000";
sprite_bombermanlogo2(102) <=
"00000000000000000000000000000010011111111111111111111111110000000000
00000000000000000000000010100000000001001000000100000000000110010000
00010010000011110011111000001100011000000010000000000000000";
sprite_bombermanlogo2(103) <=
"00000000000000000000000000000010011111111111111111111111100000000000
00000000000000000000000011000000000100111010000100000000011100000000
00011010000010111011111100011111111000000100000000000000000";
sprite_bombermanlogo2(104) <=
"00000000000000000000000000000000011111111111111111111000000000000
00000000000000000000001010110001101110011110010011000000011011110000
00011110000110011011111111111111110000001000000000000000000";
sprite_bombermanlogo2(105) <=
"00000000000000000000000000000010011111111111111111110000000000000
00000000000000000000011101111111111111111111111100000001110111010000
01101000011101111111111111111111000000000000000000000000000";
sprite_bombermanlogo2(106) <=
"00000000000000000000000000000000011111111111111110000000000000000
00000000000000000000111101111111111111111100111111000000101111111010011
11110000111111111111111111111111000000100000000000000000000";
sprite_bombermanlogo2(107) <=
"00000000000000000000000000000010011111111111111110000000000000000
00000000000000000001111111011110101111111111111111000001111111111101111
11100000111111111111111111111110000000000000000000000000000";
sprite_bombermanlogo2(108) <=
"00000000000000000000000000000000011111111111110000000000000000000
00000000000000000011111111111111011111111111111100000011111111111111111
11100001110111111111111111111100000000000000000000000000000";
sprite_bombermanlogo2(109) <=
"00000000000000000000000000000010011111111111000000000000000000000
00000000000000000111111111000111111000111111111100000111111110001111
11110000111011110011111111111100000001000000000000000000000";
sprite_bombermanlogo2(110) <=
"00000000000000000000000000000000011111110000000000000000000000000
00000000000000000111111111000001111000011111111100001111111100001111
11110000101111110000111111111110000000000000000000000000000";

sprite_bombermanlogo2(111) <=
"00000000000000000000000000000000000000001111100000000000000100000000
00000000000000000011111111100000011100000011111111000001111111000000111
11110001111111100000011111111111000000100000000000000000000000";
sprite_bombermanlogo2(112) <=
"00000000000000000000000000000000000000100000000000000000010010000000
00000000000000000011111111100000011000000011111111000011111110000000111
11110001111111100000011111111110000000000000000000000000000000";
sprite_bombermanlogo2(113) <=
"00000000000000000000000000000000000000000000000000000010000000000000
00000000000000000011111111100000000100000000111111110000111111100000011
11110000111111110000001111111100000000100000000000000000000000";
sprite_bombermanlogo2(114) <=
"00000000000000000000000000000000000000000000000000000010000001000000
00000000000000000011111111000000000000000000011111110000011111100000000011
11000000100011000000000010000000000000000000000000000000000000";
sprite_bombermanlogo2(115) <=
"00000000000000000000000000000000000000000000000000000010000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(116) <=
"00000000000000000000000000000000000000000010000000110000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000011000000000000010000000000000000000000000";
sprite_bombermanlogo2(117) <=
"00000000000000000000000000000000000000000010011000000000000000010000
00000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(118) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000010000000000000010000000000000000000000000";
sprite_bombermanlogo2(119) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000
00000000010000000000100000000000000000000000000000000000000000";
sprite_bombermanlogo2(120) <=
"00000000000000000000000000000000000000000000000000000000000000000100

00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000100111111111000000000111111000000000000000000000000000000";
sprite_bombermanlogo2(121) <=
"00000000000000000000000000000000000000000000000000000000000000000000000010
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000001000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(122) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(123) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(124) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
10000000000000000000000000000000000000000000000000000000000000000000000000000000
00000100000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(125) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
01000000000000000000000000000000000000000000000000000000000000000000000000000000
00001000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(126) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00100000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(127) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00010000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(128) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(129) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000001
00000000000000000000000000000000000000000000000000000000000000000000000000000000";

```
sprite_bombermanlogo2(130) <=
"0000000000000000000000000000000000000000000000000000000000000000000000000
0000000100000000000000000000000000000000000000000000000000000000000000010
0000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(131) <=
"0000000000000000000000000000000000000000000000000000000000000000000000000
0000000100000000000000000000000000000000000000000000000000000000000000100
0000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(132) <=
"0000000000000000000000000000000000000000000000000000000000000000000000000
0000000001000000000000000000000000000000000000000000000000000000000010000
0000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(133) <=
"0000000000000000000000000000000000000000000000000000000000000000000000000
0000000000010000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(134) <=
"0000000000000000000000000000000000000000000000000000000000000000000000000
0000000000001000000000000000000000000000000000000000000000000000000010000000
0000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(135) <=
"0000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000010000000000000000000000000000000000000000000000000000100000000
0000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(136) <=
"0000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000100000000000000000000000000000000000000000000000001000000000
0000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(137) <=
"0000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000001000000000000000000000000000000000000000000000100000000000
0000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(138) <=
"0000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000110000000000000000000000000000000000000000011000000000000
0000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(139) <=
"0000000000000000000000000000000000000000000000000000000000000000000000000
```

00000000000000000000000011000000000000000000110000000000000000000
00000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(140) <=
"00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000001111111111100000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(141) <=
"00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(142) <=
"00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(143) <=
"00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(144) <=
"00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(145) <=
"00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(146) <=
"00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(147) <=
"00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(148) <=
"00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000";

```
sprite_bombermanlogo2(149) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(150) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(151) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(152) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(153) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(154) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(155) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(156) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(157) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(158) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
```

00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(159) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(160) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(161) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(162) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(163) <=
"00000000000000000000000000000000000011100000000000000000000000000000000000000000
00000000010100000000010000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(164) <=
"00000000000000000000000000000000000100000000010100010100000000010000
00000000010100000000010000000000000000000000000000000000000100000100
00000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(165) <=
"00000000000000000000000000000000000101000100001010001010000000010000
01000000000000000000010000000000000000000000000000000101001000000000
00000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(166) <=
"00000000000000000000000000000000000000000000010100000100000000010000
01001000010100000100000000000000000000000000000000000101000001000010
10001000100000010000100000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(167) <=
"00000000000000000000000000000000000101000000001011111010000000100111
10100010101000010100000000000000000000000000000000000101000101010
10010000000001010100000000000000000000000000000000000000000000000000";

sprite_bombermanlogo2(168) <=
"00000000000000000000000000000000010100000000010010100100000000001010
010100100101101000100100000000000000000000000000000000001001000001000
000101000000001000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(169) <=
"00000000000000000000000000000000010100000000010100000100000001010000
010010000101100000010010000000000000000000000000000000001010001010000
100001001000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(170) <=
"00000000000000000000000000000000000000000000010100010100000000010000
010000101101101000000100000000000000000000000000000000000000100000100
000101001000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(171) <=
"00000000000000000000000000000000001010001011010100010101100000010000
010000101101001000000100000000000000000000000001001000000000000000001
010101001000001010100000000000000000000000000000000000000000000";
sprite_bombermanlogo2(172) <=
"00000000000000000000000000000000000100000000010100010100000000010000
010100000101010000000100000000000000000000100000101000000100000100000
000001000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(173) <=
"00000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000001000000000000000000000000
000000000000000000001000000000000000000000000000000000000000000";
sprite_bombermanlogo2(174) <=
"00000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000100000000000000000000000000000000000000000000";
sprite_bombermanlogo2(175) <=
"00000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000
000000000000001000010000000000000000000000000000000000000000000";
sprite_bombermanlogo2(176) <=
"00000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000
000000000000000011000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(177) <=
"00000000000000000000000000000000000000000000000000000000000000000000

000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(178) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(179) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(180) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(181) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(182) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(183) <=
"000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(184) <=
"000000000000000000000000000000000111100001100000011000000000001111
010000000000000000000000000000000000000011100000110000000100000100
001100000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(185) <=
"000000000000000000000000000000010010000001001000000000000000101110
010000000000000000000000000000000000000000000010000001000001010
000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(186) <=
"000000000000000000000000000000000000000010010000000000000001010000
010000000000000000000000000000000000000000010001001000000000000000
010100000000000000000000000000000000000000000000000000000000000000";

```
sprite_bombermanlogo2(187) <=
"00000000000000000000000000000000000000000010000010000000000101000000
01000000000000000011000000000000100000000000000000100000010001000000
01000000101000000000000100000000000000000000000000000000000000000000";
sprite_bombermanlogo2(188) <=
"00000000000000000000000000000001001000000101010001000000001010000000
01010101000000100000100000100000001000000000101010101000000010100010100
00000000000100000100000001000000000000000000000000000000000000000000";
sprite_bombermanlogo2(189) <=
"00000000000000000000000000000000100000000101000100000000000101000000
01000001001000000100101000000100101000000000001000001000000000000100100
10000100010100000000010100000000000000000000000000000000000000000000";
sprite_bombermanlogo2(190) <=
"00000000000000000000000000000000100000010110100000000000010100000000
01000001100000100100100000000100101000000000010101001000000000010100010
10000000010100010010010100000000000000000000000000000000000000000000";
sprite_bombermanlogo2(191) <=
"00000000000000000000000000000000000000000010100001000000000000000000
01000001001000000100101000000100101000000000000000010000000010000010
00000000000101000000100101000000000000000000000000000000000000000000";
sprite_bombermanlogo2(192) <=
"00000000000000000000000000000000100000000101010000000100000010000010
01000001000001000100101000000000001000000000000100010100000000010000
01000000000101000000000001000000000000000000000000000000000000000000";
sprite_bombermanlogo2(193) <=
"00000000000000000000000000000000000000000010000010001010100000000000
01000001000000000100100000100000101000000010001000001000000000101000
01000000000100000100000101000000000000000000000000000000000000000000";
sprite_bombermanlogo2(194) <=
"00000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000010000000000000000000000000000000000
00000000000000000000001000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(195) <=
"00000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000001000000000000000000000000000000000000
00000000000000000001000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(196) <=
"00000000000000000000000000000000000000000000000000000000000000000000
```

```
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(197) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(198) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";
sprite_bombermanlogo2(199) <=
"00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000000000";


sprite_bombermanlogo3(0) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(1) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(2) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(3) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111001111111111
11111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(4) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111101111100011111111111
11111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(5) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
```

```
11111111111111111111111111111111111111111111111111111100011110001111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(6) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111100111110000110000111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(7) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111000011100001000001111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(8) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111000010000000000111011111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(9) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111000000000000000000000001111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(10) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111000000000000000000000011111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(11) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111000000000000000000000011111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(12) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111000000000000000000000111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(13) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111000000000000000000000111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(14) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111000000000000000000000000001
11111111111111111111111111111111111111111111111111";
```

```
sprite_bombermanlogo3(15) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111111111111111111111111111110000000000000000000000000000000
1111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(16) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111111111111111111111111111110000000000000000000000000000001
1111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(17) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111111111111111111111111111110000000000000000000000000000011
1111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(18) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111111111111111111111111111110000000000000000000000000000111
1111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(19) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111111111111111111111111111110000000000000000000000000000111
1111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(20) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111111111111111111111111111110000000000000000000000000000011
1111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(21) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111111111111111111111111111110000000000000000000000000000001
1111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(22) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111111111111111111111111111110000000000000000000000000000000
0111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(23) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111111111111111111111111111110000000000000000000000000000000
0011111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(24) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
```

```
11111111111111111111111111111111111111111111100000000000000000000000000
00111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(25) <=
"11111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111100000000000000000000111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(26) <=
"11111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111100000000000000000000111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(27) <=
"11111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111100000000000000000000111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(28) <=
"11111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111100001000000000000000111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(29) <=
"11111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111100000000000010000111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(30) <=
"11111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111100000000000011111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(31) <=
"11111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111100000000000011111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(32) <=
"11111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111100000000010001111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(33) <=
"11111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111100000000000010001111111111
11111111111111111111111111111111111111111111111111";
```

```
sprite_bombermanlogo3(34) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111111111111111111111111000000000000000001100111111111111
1111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(35) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111111111111111111111111000000000000000000011111111111111
1111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(36) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111111111111111111111110000000000000000000000011111111111
1111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(37) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111111111111111111111110000000000000000000000001111111111
1111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(38) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111111111000000000000000100000000000000000000011111111
1111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(39) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111110000000000000000000000000000000000000000001111111
1111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(40) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111100000000000000000000000000000000000000000000011111
1111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(41) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111100000000000000000000000000000000000000000000000011111
1111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(42) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111100000000000000000000000000000000000000000000000000001111
1111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(43) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
```

```
11111111110000000000000000000000000000000000000000000000000001111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(44) <=
"11111111111111111111111111111111111111111111111111111111111111111
11111110000000000000000000000000000000000000000000000000001111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(45) <=
"11111111111111111111111111111111111111111111111111111111111111111
11111100000000000001100000000000000000000000000000000000000011
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(46) <=
"11111111111111111111111111111111111111111111111111111111111111111
11111000000000001111000000000000000000000000000000000000000111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(47) <=
"11111111111111111111111111111111111111111111111111111111111111111
11110000000000111100000000000000000000000000000000000000000011
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(48) <=
"11111111111111111111111111111111111111111111111111111111111111111
11000000000011111000000000000000000000000000000000000000000011
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(49) <=
"11111111111111111111111111111111111111111111111111111111111111111
10000000001111110000000000000000000000000000000000000000000011
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(50) <=
"11111111111111111111111111111111111111111111111111111111111111111
00000000011111100000000000000000000000000000000000000000000011
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(51) <=
"11111111111111111111111111111111111111111111111111111111111111110
00000001111110000000000000000000000000000000000000000000000011
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(52) <=
"11111111111111111111111111111111111111111111111111111111111111100
00000011111100000000000000000000000000000000000000000000000011
11111111111111111111111111111111111111111111111111";
```

```
sprite_bombermanlogo3(53) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111000
0000111111100000000000000000000000000000000000000000000000000000000000000001
11111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(54) <=
"11111111111111111111111111111111111111111111111111111111111111111111111110000
0001111111000000000000000000000000000000000000000000000000000000000000000000
11111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(55) <=
"11111111111111111111111111111111111111111111111111111111111111111111111100000
0011111110000000000000000000000000000000000000000000000000000000000000000000
01111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(56) <=
"11111111111111111111111111111111111111111111111111111111111111111111111000000
0111111100000000000000000000000000000000000000000000000000000000000000000000
00111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(57) <=
"11111111111111111111111111111111111111111111111111111111111111111111111000000
0111110000000000000000000000000000000000000000000000000000000000000000000000
00011111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(58) <=
"11111111111111111111111111111111111111111111111111111111111111111111111000000
0011100000000000000000000000000000000000000000000000000000000000000000000000
00000001111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(59) <=
"11111111111111111111111111111111111111111111111111111111111111111111111000000
0000000000000000000000000000000000000000000000000000000000000000000000000000
00000000011111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(60) <=
"11111111111111111111111111111111111111111111111111111111111111111111111000000
0000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000001111111111111111111111111111111111111111";
sprite_bombermanlogo3(61) <=
"11111111111111111111111111111111111111111111111111111111111111111111111000000
0000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000001111111111111111111111111111111111111";
sprite_bombermanlogo3(62) <=
"11111111111111111111111111111111111111111111111111111111111111111111111000000
```

000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000001111111111111111111111111111111";
sprite_bombermanlogo3(63) <=
"111111111111111111111111111111111100000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000001111111111111111111111111111111";
sprite_bombermanlogo3(64) <=
"111111111111111111111111111111111100000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000001111111111111111111111111111111";
sprite_bombermanlogo3(65) <=
"111111111111111111111111111111111100000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000001111111111111111111111111111111";
sprite_bombermanlogo3(66) <=
"111111111111111111111111111111111100000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000001111111111111111111111111111111";
sprite_bombermanlogo3(67) <=
"111111111111111111111111111111111100000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000001111111111111111111111111111111";
sprite_bombermanlogo3(68) <=
"111111111111111111111111111111111100000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000001111111111111111111111111111111";
sprite_bombermanlogo3(69) <=
"111111111111111111111111111111111100000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000001111111111111111111111111111111";
sprite_bombermanlogo3(70) <=
"111111111111111111111111111111111100000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000001111111111111111111111111111111";
sprite_bombermanlogo3(71) <=
"111111111111111111111111111111111100000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000001111111111111111111111111111111";

```
sprite_bombermanlogo3(72) <=
"11111111111111111110000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000001111111111111111111111111";
sprite_bombermanlogo3(73) <=
"11111111111111111110000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000001111111111111111111111111";
sprite_bombermanlogo3(74) <=
"11111111111111111110000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000001111111111111111111111111";
sprite_bombermanlogo3(75) <=
"11111111111111111110000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000001111111111111111111111111";
sprite_bombermanlogo3(76) <=
"11111111111111111110000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000001111111111111111111111111";
sprite_bombermanlogo3(77) <=
"11111111111111111110000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000001111111111111111111111111";
sprite_bombermanlogo3(78) <=
"11111111111111111110000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000001111111111111111111111111";
sprite_bombermanlogo3(79) <=
"11111111111111111110000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000001111111111111111111111111";
sprite_bombermanlogo3(80) <=
"11111111111111111110000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000001111111111111111111111111";
sprite_bombermanlogo3(81) <=
"11111111111111111110000000000000000000000000000000000000000000000000
```

000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000001111111111111111111111111";
sprite_bombermanlogo3(82) <=
"111111111111111111110000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000001111111111111111111111111";
sprite_bombermanlogo3(83) <=
"111111111111111111110000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000001111111111111111111111111";
sprite_bombermanlogo3(84) <=
"111111111111111111110000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000001111111111111111111111111";
sprite_bombermanlogo3(85) <=
"111111111111111111110000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000001111111111111111111111111";
sprite_bombermanlogo3(86) <=
"111111111111111111110000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000001111111111111111111111111";
sprite_bombermanlogo3(87) <=
"111111111111111111110000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000001111111111111111111111111";
sprite_bombermanlogo3(88) <=
"111111111111111111110000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000001111111111111111111111111";
sprite_bombermanlogo3(89) <=
"111111111111111111110000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000001111111111111111111111111";
sprite_bombermanlogo3(90) <=
"111111111111111111110000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000001111111111111111111111111";

sprite_bombermanlogo3(91) <=
"1111111111111111111111111000000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000111000000000001111111111111111111111111111";
sprite_bombermanlogo3(92) <=
"1111111111111111111111111100000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000110000000000000000001111111111111111111111";
sprite_bombermanlogo3(93) <=
"1111111111111111111111111100000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000011000000000000000001111111111111111111111";
sprite_bombermanlogo3(94) <=
"1111111111111111111111111110000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000001100000000000000001111111111111111111111";
sprite_bombermanlogo3(95) <=
"1111111111111111111111111111000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000111000000000000000011111111111111111111";
sprite_bombermanlogo3(96) <=
"1111111111111111111111111111000000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000011100000000000000011111111111111111111";
sprite_bombermanlogo3(97) <=
"1111111111111111111111111111100000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000011100000000000000011111111111111111111";
sprite_bombermanlogo3(98) <=
"1111111111111111111111111111100000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000001000000000000000000111111111111111111";
sprite_bombermanlogo3(99) <=
"1111111111111111111111111111110000000000000000000000000000000000000000000
00000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000001000000000000000000111111111111111111";
sprite_bombermanlogo3(100) <=
"1111111111111111111111111111110000000000000000000000000000000000000000000

000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000001111111111111111";
sprite_bombermanlogo3(101) <=
"111111111111111111111111111111000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000001111111111111111";
sprite_bombermanlogo3(102) <=
"111111111111111111111111111111000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000001111111111111111";
sprite_bombermanlogo3(103) <=
"111111111111111111111111111111000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000001111111111111111";
sprite_bombermanlogo3(104) <=
"111111111111111111111111111111000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000001111111111111111";
sprite_bombermanlogo3(105) <=
"111111111111111111111111111111000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000001111111111111111";
sprite_bombermanlogo3(106) <=
"111111111111111111111111111111000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000001111111111111111";
sprite_bombermanlogo3(107) <=
"111111111111111111111111111111000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000001111111111111111";
sprite_bombermanlogo3(108) <=
"111111111111111111111111111111000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000001111111111111111";
sprite_bombermanlogo3(109) <=
"111111111111111111111111111111000000000000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000000000001111111111111111";

sprite_bombermanlogo3(110) <=
"1111111111111111111111111111111111110000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000001111111111111111111111";
sprite_bombermanlogo3(111) <=
"11111111111111111111111111111111111110000000000000000000000000000000000
000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000001111111111111111111111";
sprite_bombermanlogo3(112) <=
"11111111111111111111111111111111111110000000000000000001100000000000000
000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000011111111111111111111111";
sprite_bombermanlogo3(113) <=
"11111111111111111111111111111111111111000000000000000001111000000000000
000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000011111111111111111111111";
sprite_bombermanlogo3(114) <=
"11111111111111111111111111111111111111110000000000000011111000000000000
000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000111111111111111111111111";
sprite_bombermanlogo3(115) <=
"11111111111111111111111111111111111111111000000000000111111111000000000
000000000000000000000000000000000000000000000000000000000000000000000
000000000000000000000000000000000000111111111111111111111111";
sprite_bombermanlogo3(116) <=
"111111111111111111111111111111111111111110000000000111111111110000000000
000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000000000000111111111111111111111111";
sprite_bombermanlogo3(117) <=
"111111111111111111111111111111111111111111100000111111111111111000000000
000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000011100000000000001111111111111111111111111";
sprite_bombermanlogo3(118) <=
"1111111111111111111111111111111111111111111111111111111111111111000000000
000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000011110000000000001111111111111111111111111";
sprite_bombermanlogo3(119) <=
"1111111111111111111111111111111111111111111111111111111111111111100000000

```
000000000000000000000000000000000000000000000000000000000000000000000000
000000000000000011111100000000111111111111111111111111";
sprite_bombermanlogo3(120) <=
"111111111111111111111111111111111111111111111111111111111111111100000000
000000000000000000000000000000000000000000000000000000000000000000000000
000011000000000111111111000000111111111111111111111111";
sprite_bombermanlogo3(121) <=
"111111111111111111111111111111111111111111111111111111111111111110000000
000000000000000000000000000000000000000000000000000000000000000000000000
000111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(122) <=
"111111111111111111111111111111111111111111111111111111111111111111000000
000000000000000000000000000000000000000000000000000000000000000000000000
001111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(123) <=
"111111111111111111111111111111111111111111111111111111111111111111100000
000000000000000000000000000000000000000000000000000000000000000000000000
011111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(124) <=
"111111111111111111111111111111111111111111111111111111111111111111100000
000000000000000000000000000000000000000000000000000000000000000000000000
011111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(125) <=
"111111111111111111111111111111111111111111111111111111111111111111110000
000000000000000000000000000000000000000000000000000000000000000000000000
111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(126) <=
"111111111111111111111111111111111111111111111111111111111111111111111000
000000000000000000000000000000000000000000000000000000000000000000000011
111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(127) <=
"111111111111111111111111111111111111111111111111111111111111111111111100
000000000000000000000000000000000000000000000000000000000000000000000111
111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(128) <=
"111111111111111111111111111111111111111111111111111111111111111111111111
000000000000000000000000000000000000000000000000000000000000000000001111
111111111111111111111111111111111111111111111111111111";
```

```
sprite_bombermanlogo3(129) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111
10000000000000000000000000000000000000000000000000000000000000000000011111
11111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(130) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111
11000000000000000000000000000000000000000000000000000000000000000000111111
11111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(131) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111
11100000000000000000000000000000000000000000000000000000000000000001111111
11111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(132) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111
11111000000000000000000000000000000000000000000000000000000000001111111111
11111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(133) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111
11111100000000000000000000000000000000000000000000000000000000111111111111
11111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(134) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111
11111111000000000000000000000000000000000000000000000000000001111111111111
11111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(135) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111
11111111100000000000000000000000000000000000000000000000000011111111111111
11111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(136) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111
11111111110000000000000000000000000000000000000000000000000111111111111111
11111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(137) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111
11111111111110000000000000000000000000000000000000000001111111111111111111
11111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(138) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111
```

```
11111111111111110000000000000000000000000000001111111111111111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(139) <=
"11111111111111111111111111111111111111111111111111111111111111111111
11111111111111111110000000000000000000000001111111111111111111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(140) <=
"11111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111110000000000001111111111111111111111111111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(141) <=
"11111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(142) <=
"11111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(143) <=
"11111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(144) <=
"11111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(145) <=
"11111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(146) <=
"11111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(147) <=
"11111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111";
```

```
sprite_bombermanlogo3(148) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(149) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(150) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(151) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(152) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(153) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(154) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(155) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(156) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(157) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
```

```
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(158) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(159) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(160) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(161) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(162) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(163) <=
"11111111111111111111111111111111111111000111111111111111111111111111111111111111
11110001111111100111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(164) <=
"11111111111111111111111111111111111000000111100011100011111111001111001111
11110001111111100111111111111111111111111100111111100111000111001111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(165) <=
"11111111111111111111111111111111111000111011110001110001111111001111001111
11111111111111100111111111111111111111111100111111100011000111001111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(166) <=
"11111111111111111111111111111111111001111111100011100111111110011110011
00001000110000110000011111111111111111111100111111100011000011001000001
10000011100000011111111111111111111111111111111111";
```

sprite_bombermanlogo3(167) <=
"1111111111111111111111111111111100011111111100000000011111110000000001
0011010001001000100110011111111111111111111100111111110010000010001011000
1100110010001000111111111111111111111111111111111111111111";
sprite_bombermanlogo3(168) <=
"1111111111111111111111111111111100011111111100000000011111110000000001
0000011000000110010011001111111111111111111100111111110010010010011111000
0100110010011100111111111111111111111111111111111111111111";
sprite_bombermanlogo3(169) <=
"1111111111111111111111111111111100011111111100011110011111110001111001100
0000100000000001001100111111111111111111110011111111000001000001100000000
1001100100111001111111111111111111111111111111111111111111";
sprite_bombermanlogo3(170) <=
"1111111111111111111111111111111100111111111000111000111111110011110011100
1100000000011111001100111111111111111111110011111111000011000011001000000
1001100100111001111111111111111111111111111111111111111111";
sprite_bombermanlogo3(171) <=
"1111111111111111111111111111111100011101001000111000100111110011110011001
1110000001001111100110011111111111111111110011011111100011100011000100000
0100110010001000111111111111111111111111111111111111111111";
sprite_bombermanlogo3(172) <=
"1111111111111111111111111111111100000010010001110001001111100111100100100
0000010001000001100110011111111111111111000011000111110001110001110000000
0100110011000000111111111111111111111111111111111111111111";
sprite_bombermanlogo3(173) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111111111111111111101111111111111111111111111111111111111111
1111111100111111111111111111111111111111111111111111";
sprite_bombermanlogo3(174) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111100111111111111111111111111111111111111111111";
sprite_bombermanlogo3(175) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111111111111111111111111111111111111111111111111111111111111
1111000000111111111111111111111111111111111111111111";
sprite_bombermanlogo3(176) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111

```
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111100111111111111111111111111111111111111111111";
sprite_bombermanlogo3(177) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(178) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(179) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(180) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(181) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(182) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(183) <=
"11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111111111111111111111111111111111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(184) <=
"11111111111111111111111111111111100001111100111111001111111111100001001
11111111111111111111111111111111111000111110011111111011111011110011111
11111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(185) <=
"11111111111111111111111111111111000000111100001111000111111111000000100
11111111111111111111111111111111111000111110001111110001110001110011111
11111111111111111111111111111111111111111111111111";
```

```
sprite_bombermanlogo3(186) <=
"1111111111111111111111111111111001111111000011110001111111100011111001
1111111111111111111111111111111111111110000111000011111100111000110001111
1111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(187) <=
"1111111111111111111111111111111001111111000011100001111111000111111000
0001110000110000000000111000000111111100001110000111111100110000110011
0000010000001110000001111111111111111111111111111111111111";
sprite_bombermanlogo3(188) <=
"1111111111111111111111111111111000011111100000110000111111100011111100
0100010011001001100011001001100011111110000010000011111110001000001001
1111001000110010011000111111111111111111111111111111111111";
sprite_bombermanlogo3(189) <=
"1111111111111111111111111111111000011111000001001001111111000111111001
1100100110010011000110010011000111111100100001001111111100001001001001
1110001000110010011000111111111111111111111111111111111111";
sprite_bombermanlogo3(190) <=
"1111111111111111111111111111111100011110000000010011111110001111100 1
1000000000100110011100100110001111111001000001001111111100000100000011
0000010001100100110001111111111111111111111111111111111111";
sprite_bombermanlogo3(191) <=
"1111111111111111111111111111111100111100010000100111111110011111100 1
1001001111100110001100100110001111111001100011001111111100001100001100
1100100011001001100011111111111111111111111111111111111111";
sprite_bombermanlogo3(192) <=
"1111111111111111111111111111111011100100100010001100100111110001110100
1110010011011001100011001001100011111110011000110010011111100011100011
0011001000110010011000111111111111111111111111111111111111";
sprite_bombermanlogo3(193) <=
"1111111111111111111111111111111000001100100111001100100011111100000100
1110011000011001100111001100000011111110011001110010011111100011100011 1
0000010011100110000001111111111111111111111111111111111111";
sprite_bombermanlogo3(194) <=
"1111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111111111100111111111111111111111111111111111111111111
1111111111110011111111111111111111111111111111111111";
sprite_bombermanlogo3(195) <=
"1111111111111111111111111111111111111111111111111111111111111111111111
```

```
1111111111111111111111011100111111111111111111111111111111111111111111111111
1111111101110011111111111111111111111111111111111111";
sprite_bombermanlogo3(196) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111110000011111111111111111111111111111111111111111111111111
1111111100000111111111111111111111111111111111111111";
sprite_bombermanlogo3(197) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(198) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111111111111111111111111111111111111";
sprite_bombermanlogo3(199) <=
"1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111111111111111111111111111111111111111111111111111111111111
1111111111111111111111111111111111111111111111111111";
```

```
--bomberman0 outside--
sprite_bomberman0(0)   <= "00000000000000000000000000000000";
sprite_bomberman0(1)   <= "00000000000011111111100000000000";
sprite_bomberman0(2)   <= "00000000001000000000010000000000";
sprite_bomberman0(3)   <= "00000000110000000000001100000000";
sprite_bomberman0(4)   <= "00000001000000000000000010000000";
sprite_bomberman0(5)   <= "00000010000000000000000001000000";
sprite_bomberman0(6)   <= "00000100000000000000000000100000";
sprite_bomberman0(7)   <= "00000100000000000000000000100000";
sprite_bomberman0(8)   <= "00000100000000000000000000100000";
sprite_bomberman0(9)   <= "00000100000110000011000000100000";
sprite_bomberman0(10) <= "00000100000110000011000000100000";
sprite_bomberman0(11) <= "00000100000110000011000000100000";
sprite_bomberman0(12) <= "00000100000110000011000000100000";
sprite_bomberman0(13) <= "00000001000000000000000001000000";
sprite_bomberman0(14) <= "00000000100000000000000010000000";
```

```
sprite_bomberman0(15) <= "00000000010000000000000100000000";
sprite_bomberman0(16) <= "00000000010000000000000100000000";
sprite_bomberman0(17) <= "00000000100000000000000010000000";
sprite_bomberman0(18) <= "00000000100000000000000001000000";
sprite_bomberman0(19) <= "00000001000111100011110000100000";
sprite_bomberman0(20) <= "00000010000111100011110000100000";
sprite_bomberman0(21) <= "00000010000000000000000000100000";
sprite_bomberman0(22) <= "00000001000000000000000001000000";
sprite_bomberman0(23) <= "00000000111000000000001110000000";
sprite_bomberman0(24) <= "00000000000100000000010000000000";
sprite_bomberman0(25) <= "00000000111100000000011110000000";
sprite_bomberman0(26) <= "00000001111000011100001111000000";
sprite_bomberman0(27) <= "00000011100000011100000011100000";
sprite_bomberman0(28) <= "00000011100000011100000011100000";
sprite_bomberman0(29) <= "00000001111111111111111111000000";
sprite_bomberman0(30) <= "00000000011111111111111100000000";
sprite_bomberman0(31) <= "00000000000000000000000000000000";

--bomberman1 shoes and gloves--
sprite_bomberman1(0)  <= "00000000000000000000000000000000";
sprite_bomberman1(1)  <= "00000000000000000000000000000000";
sprite_bomberman1(2)  <= "00000000000000000000000000000000";
sprite_bomberman1(3)  <= "00000000000000000000000000000000";
sprite_bomberman1(4)  <= "00000000000000000000000000000000";
sprite_bomberman1(5)  <= "00000000000000000000000000000000";
sprite_bomberman1(6)  <= "00000000000000000000000000000000";
sprite_bomberman1(7)  <= "00000000000000000000000000000000";
sprite_bomberman1(8)  <= "00000000001111111111111000000000";
sprite_bomberman1(9)  <= "00000000010000000000000100000000";
sprite_bomberman1(10) <= "00000000010000000000000100000000";
sprite_bomberman1(11) <= "00000000010000000000000100000000";
sprite_bomberman1(12) <= "00000000010000000000000100000000";
sprite_bomberman1(13) <= "00000000001111111111111000000000";
sprite_bomberman1(14) <= "00000000000000000000000000000000";
sprite_bomberman1(15) <= "00000000000000000000000000000000";
sprite_bomberman1(16) <= "00000000000000000000000000000000";
sprite_bomberman1(17) <= "00000000000000000000000000000000";
sprite_bomberman1(18) <= "00000000000000000000000000000000";
```

```
sprite_bomberman1(19) <= "00000000000000011100000000000000";
sprite_bomberman1(20) <= "00000001111100011100011111000000";
sprite_bomberman1(21) <= "00000001111100000000011111000000";
sprite_bomberman1(22) <= "00000000111100000000011110000000";
sprite_bomberman1(23) <= "00000000000000000000000000000000";
sprite_bomberman1(24) <= "00000000000000000000000000000000";
sprite_bomberman1(25) <= "00000000000000000000000000000000";
sprite_bomberman1(26) <= "00000000000111100011110000000000";
sprite_bomberman1(27) <= "00000000011111100011111100000000";
sprite_bomberman1(28) <= "00000000011111100011111100000000";
sprite_bomberman1(29) <= "00000000000000000000000000000000";
sprite_bomberman1(30) <= "00000000000000000000000000000000";
sprite_bomberman1(31) <= "00000000000000000000000000000000";

--bomberman2 skin--
sprite_bomberman2(0)  <= "00000000000000000000000000000000";
sprite_bomberman2(1)  <= "00000000000000000000000000000000";
sprite_bomberman2(2)  <= "00000000000000000000000000000000";
sprite_bomberman2(3)  <= "00000000000000000000000000000000";
sprite_bomberman2(4)  <= "00000000000000000000000000000000";
sprite_bomberman2(5)  <= "00000000000000000000000000000000";
sprite_bomberman2(6)  <= "00000000000000000000000000000000";
sprite_bomberman2(7)  <= "00000000000000000000000000000000";
sprite_bomberman2(8)  <= "00000000000000000000000000000000";
sprite_bomberman2(9)  <= "00000000001100111110011000000000";
sprite_bomberman2(10) <= "00000000001100111110011000000000";
sprite_bomberman2(11) <= "00000000001100111110011000000000";
sprite_bomberman2(12) <= "00000000001100111110011000000000";
sprite_bomberman2(13) <= "00000000000000000000000000000000";
sprite_bomberman2(14) <= "00000000000000000000000000000000";
sprite_bomberman2(15) <= "00000000000000000000000000000000";
sprite_bomberman2(16) <= "00000000001100000000011000000000";
sprite_bomberman2(17) <= "00000000011100000000011100000000";
sprite_bomberman2(18) <= "00000000111000000000001110000000";
sprite_bomberman2(19) <= "00000000110000000000000110000000";
sprite_bomberman2(20) <= "00000000000000000000000000000000";
sprite_bomberman2(21) <= "00000000000000000000000000000000";
sprite_bomberman2(22) <= "00000000000000000000000000000000";
```

```
sprite_bomberman2(23) <= "00000000000011100011100000000000";
sprite_bomberman2(24) <= "00000000000011100011100000000000";
sprite_bomberman2(25) <= "00000000000011100011100000000000";
sprite_bomberman2(26) <= "00000000000000000000000000000000";
sprite_bomberman2(27) <= "00000000000000000000000000000000";
sprite_bomberman2(28) <= "00000000000000000000000000000000";
sprite_bomberman2(29) <= "00000000000000000000000000000000";
sprite_bomberman2(30) <= "00000000000000000000000000000000";
sprite_bomberman2(31) <= "00000000000000000000000000000000";

--bomberman3 helmet--
sprite_bomberman3(0)  <= "00000000000000000000000000000000";
sprite_bomberman3(1)  <= "00000000000000000000000000000000";
sprite_bomberman3(2)  <= "00000000000011111111100000000000";
sprite_bomberman3(3)  <= "00000000000111111111110000000000";
sprite_bomberman3(4)  <= "00000000011111111111111100000000";
sprite_bomberman3(5)  <= "00000000111111111111111110000000";
sprite_bomberman3(6)  <= "00000001111111111111111111000000";
sprite_bomberman3(7)  <= "00000001111111111111111111000000";
sprite_bomberman3(8)  <= "00000001110000000000000111000000";
sprite_bomberman3(9)  <= "00000001100100000000010011000000";
sprite_bomberman3(10) <= "00000001100100000000010011000000";
sprite_bomberman3(11) <= "00000001100100000000010011000000";
sprite_bomberman3(12) <= "00000001100100000000010011000000";
sprite_bomberman3(13) <= "00000000110000000000000110000000";
sprite_bomberman3(14) <= "00000000011111111111111100000000";
sprite_bomberman3(15) <= "00000000001111111111111000000000";
sprite_bomberman3(16) <= "00000000000000000000000000000000";
sprite_bomberman3(17) <= "00000000000000000000000000000000";
sprite_bomberman3(18) <= "00000000000000000000000000000000";
sprite_bomberman3(19) <= "00000000000000000000000000000000";
sprite_bomberman3(20) <= "00000000000000000000000000000000";
sprite_bomberman3(21) <= "00000000000000000000000000000000";
sprite_bomberman3(22) <= "00000000000000000000000000000000";
sprite_bomberman3(23) <= "00000000000000000000000000000000";
sprite_bomberman3(24) <= "00000000000000000000000000000000";
sprite_bomberman3(25) <= "00000000000000000000000000000000";
sprite_bomberman3(26) <= "00000000000000000000000000000000";
```

```
sprite_bomberman3(27) <= "00000000000000000000000000000000";
sprite_bomberman3(28) <= "00000000000000000000000000000000";
sprite_bomberman3(29) <= "00000000000000000000000000000000";
sprite_bomberman3(30) <= "00000000000000000000000000000000";
sprite_bomberman3(31) <= "00000000000000000000000000000000";

--bomberman1 body--
sprite_bomberman4(0)  <= "00000000000000000000000000000000";
sprite_bomberman4(1)  <= "00000000000000000000000000000000";
sprite_bomberman4(2)  <= "00000000000000000000000000000000";
sprite_bomberman4(3)  <= "00000000000000000000000000000000";
sprite_bomberman4(4)  <= "00000000000000000000000000000000";
sprite_bomberman4(5)  <= "00000000000000000000000000000000";
sprite_bomberman4(6)  <= "00000000000000000000000000000000";
sprite_bomberman4(7)  <= "00000000000000000000000000000000";
sprite_bomberman4(8)  <= "00000000000000000000000000000000";
sprite_bomberman4(9)  <= "00000000000000000000000000000000";
sprite_bomberman4(10) <= "00000000000000000000000000000000";
sprite_bomberman4(11) <= "00000000000000000000000000000000";
sprite_bomberman4(12) <= "00000000000000000000000000000000";
sprite_bomberman4(13) <= "00000000000000000000000000000000";
sprite_bomberman4(14) <= "00000000000000000000000000000000";
sprite_bomberman4(15) <= "00000000000000000000000000000000";
sprite_bomberman4(16) <= "00000000000011111111100000000000";
sprite_bomberman4(17) <= "00000000011111111111111000000000";
sprite_bomberman4(18) <= "00000000011111111111111000000000";
sprite_bomberman4(19) <= "00000000011111111111111000000000";
sprite_bomberman4(20) <= "00000000011111111111111000000000";
sprite_bomberman4(21) <= "00000000011111111111110000000000";
sprite_bomberman4(22) <= "00000000000011111111000000000000";
sprite_bomberman4(23) <= "00000000000011111111000000000000";
sprite_bomberman4(24) <= "00000000000000000000000000000000";
sprite_bomberman4(25) <= "00000000000000000000000000000000";
sprite_bomberman4(26) <= "00000000000000000000000000000000";
sprite_bomberman4(27) <= "00000000000000000000000000000000";
sprite_bomberman4(28) <= "00000000000000000000000000000000";
sprite_bomberman4(29) <= "00000000000000000000000000000000";
sprite_bomberman4(30) <= "00000000000000000000000000000000";
```

```
sprite_bomberman4(31) <= "00000000000000000000000000000000";


--bombermanB0 outside--
sprite_bombermanB0(0)  <= "00000000000000000000000000000000";
sprite_bombermanB0(1)  <= "00000000000011111111100000000000";
sprite_bombermanB0(2)  <= "00000000001000000000010000000000";
sprite_bombermanB0(3)  <= "00000000110000000000001100000000";
sprite_bombermanB0(4)  <= "00000001000000000000000010000000";
sprite_bombermanB0(5)  <= "00000010000000000000000001000000";
sprite_bombermanB0(6)  <= "00000100000000000000000000100000";
sprite_bombermanB0(7)  <= "00000100000000000000000000100000";
sprite_bombermanB0(8)  <= "00000100000000000000000000100000";
sprite_bombermanB0(9)  <= "00000100000000000000000000100000";
sprite_bombermanB0(10) <= "00000100000000000000000000100000";
sprite_bombermanB0(11) <= "00000100000000000000000000100000";
sprite_bombermanB0(12) <= "00000100000000000000000000100000";
sprite_bombermanB0(13) <= "00000001000000000000000001000000";
sprite_bombermanB0(14) <= "00000000100000000000000010000000";
sprite_bombermanB0(15) <= "00000000010000000000000100000000";
sprite_bombermanB0(16) <= "00000000010000000000000100000000";
sprite_bombermanB0(17) <= "00000000100000000000000010000000";
sprite_bombermanB0(18) <= "00000001000000000000000001000000";
sprite_bombermanB0(19) <= "00000001000111111111110000100000";
sprite_bombermanB0(20) <= "00000010000111111111110000100000";
sprite_bombermanB0(21) <= "00000100000000000000000000100000";
sprite_bombermanB0(22) <= "00000001000000000000000001000000";
sprite_bombermanB0(23) <= "00000000111100000000011110000000";
sprite_bombermanB0(24) <= "00000000000100000000010000000000";
sprite_bombermanB0(25) <= "00000000111100011100011110000000";
sprite_bombermanB0(26) <= "00000001111000011100001111000000";
sprite_bombermanB0(27) <= "00000011100000011100000011100000";
sprite_bombermanB0(28) <= "00000011100000011100000011100000";
sprite_bombermanB0(29) <= "00000001111111111111111111000000";
sprite_bombermanB0(30) <= "00000000011111111111111100000000";
sprite_bombermanB0(31) <= "00000000000000000000000000000000";

--bombermanB1 shoes and gloves--
```

```
sprite_bombermanB1(0)  <= "00000000000000000000000000000000";
sprite_bombermanB1(1)  <= "00000000000000000000000000000000";
sprite_bombermanB1(2)  <= "00000000000000011100000000000000";
sprite_bombermanB1(3)  <= "00000000000000111110000000000000";
sprite_bombermanB1(4)  <= "00000000000000111110000000000000";
sprite_bombermanB1(5)  <= "00000000000000011100000000000000";
sprite_bombermanB1(6)  <= "00000000000000000000000000000000";
sprite_bombermanB1(7)  <= "00000000000000000000000000000000";
sprite_bombermanB1(8)  <= "00000000000000000000000000000000";
sprite_bombermanB1(9)  <= "00000000000000000000000000000000";
sprite_bombermanB1(10) <= "00000000000000000000000000000000";
sprite_bombermanB1(11) <= "00000000000000000000000000000000";
sprite_bombermanB1(12) <= "00000000000000000000000000000000";
sprite_bombermanB1(13) <= "00000000000000000000000000000000";
sprite_bombermanB1(14) <= "00000000000000000000000000000000";
sprite_bombermanB1(15) <= "00000000000000000000000000000000";
sprite_bombermanB1(16) <= "00000000000000000000000000000000";
sprite_bombermanB1(17) <= "00000000000000000000000000000000";
sprite_bombermanB1(18) <= "00000000000000000000000000000000";
sprite_bombermanB1(19) <= "00000000000000000000000000000000";
sprite_bombermanB1(20) <= "00000001111100000000011111000000";
sprite_bombermanB1(21) <= "00000001111100000000011111000000";
sprite_bombermanB1(22) <= "00000000111100000000011110000000";
sprite_bombermanB1(23) <= "00000000000000000000000000000000";
sprite_bombermanB1(24) <= "00000000000000000000000000000000";
sprite_bombermanB1(25) <= "00000000000000000000000000000000";
sprite_bombermanB1(26) <= "00000000000111100011110000000000";
sprite_bombermanB1(27) <= "00000000011111100011111100000000";
sprite_bombermanB1(28) <= "00000000011111100011111100000000";
sprite_bombermanB1(29) <= "00000000000000000000000000000000";
sprite_bombermanB1(30) <= "00000000000000000000000000000000";
sprite_bombermanB1(31) <= "00000000000000000000000000000000";

--bombermanB2 skin--
sprite_bombermanB2(0)  <= "00000000000000000000000000000000";
sprite_bombermanB2(1)  <= "00000000000000000000000000000000";
sprite_bombermanB2(2)  <= "00000000000000000000000000000000";
sprite_bombermanB2(3)  <= "00000000000000000000000000000000";
```

```
sprite_bombermanB2(4)  <= "00000000000000000000000000000000";
sprite_bombermanB2(5)  <= "00000000000000000000000000000000";
sprite_bombermanB2(6)  <= "00000000000000000000000000000000";
sprite_bombermanB2(7)  <= "00000000000000000000000000000000";
sprite_bombermanB2(8)  <= "00000000000000000000000000000000";
sprite_bombermanB2(9)  <= "00000000000000000000000000000000";
sprite_bombermanB2(10) <= "00000000000000000000000000000000";
sprite_bombermanB2(11) <= "00000000000000000000000000000000";
sprite_bombermanB2(12) <= "00000000000000000000000000000000";
sprite_bombermanB2(13) <= "00000000000000000000000000000000";
sprite_bombermanB2(14) <= "00000000000000000000000000000000";
sprite_bombermanB2(15) <= "00000000000000000000000000000000";
sprite_bombermanB2(16) <= "00000000001100000000011000000000";
sprite_bombermanB2(17) <= "00000000011100000000011100000000";
sprite_bombermanB2(18) <= "00000000111000000000001110000000";
sprite_bombermanB2(19) <= "00000000110000000000000110000000";
sprite_bombermanB2(20) <= "00000000000000000000000000000000";
sprite_bombermanB2(21) <= "00000000000000000000000000000000";
sprite_bombermanB2(22) <= "00000000000000000000000000000000";
sprite_bombermanB2(23) <= "00000000000011100011100000000000";
sprite_bombermanB2(24) <= "00000000000011100011100000000000";
sprite_bombermanB2(25) <= "00000000000011100011100000000000";
sprite_bombermanB2(26) <= "00000000000000000000000000000000";
sprite_bombermanB2(27) <= "00000000000000000000000000000000";
sprite_bombermanB2(28) <= "00000000000000000000000000000000";
sprite_bombermanB2(29) <= "00000000000000000000000000000000";
sprite_bombermanB2(30) <= "00000000000000000000000000000000";
sprite_bombermanB2(31) <= "00000000000000000000000000000000";

--bombermanB3 helmet--
sprite_bombermanB3(0)  <= "00000000000000000000000000000000";
sprite_bombermanB3(1)  <= "00000000000000000000000000000000";
sprite_bombermanB3(2)  <= "00000000000011100011100000000000";
sprite_bombermanB3(3)  <= "00000000000111000001110000000000";
sprite_bombermanB3(4)  <= "00000000011111000001111100000000";
sprite_bombermanB3(5)  <= "00000000111111100011111110000000";
sprite_bombermanB3(6)  <= "00000001111111111111111111000000";
sprite_bombermanB3(7)  <= "00000001111111111111111111000000";
```

```
sprite_bombermanB3(8)    <= "00000001111111111111111111000000";
sprite_bombermanB3(9)    <= "00000001111111111111111111000000";
sprite_bombermanB3(10) <= "00000001111111111111111111000000";
sprite_bombermanB3(11) <= "00000001111111111111111111000000";
sprite_bombermanB3(12) <= "00000001111111111111111111000000";
sprite_bombermanB3(13) <= "00000000111111111111111110000000";
sprite_bombermanB3(14) <= "00000000011111111111111100000000";
sprite_bombermanB3(15) <= "00000000001111111111111000000000";
sprite_bombermanB3(16) <= "00000000000000000000000000000000";
sprite_bombermanB3(17) <= "00000000000000000000000000000000";
sprite_bombermanB3(18) <= "00000000000000000000000000000000";
sprite_bombermanB3(19) <= "00000000000000000000000000000000";
sprite_bombermanB3(20) <= "00000000000000000000000000000000";
sprite_bombermanB3(21) <= "00000000000000000000000000000000";
sprite_bombermanB3(22) <= "00000000000000000000000000000000";
sprite_bombermanB3(23) <= "00000000000000000000000000000000";
sprite_bombermanB3(24) <= "00000000000000000000000000000000";
sprite_bombermanB3(25) <= "00000000000000000000000000000000";
sprite_bombermanB3(26) <= "00000000000000000000000000000000";
sprite_bombermanB3(27) <= "00000000000000000000000000000000";
sprite_bombermanB3(28) <= "00000000000000000000000000000000";
sprite_bombermanB3(29) <= "00000000000000000000000000000000";
sprite_bombermanB3(30) <= "00000000000000000000000000000000";
sprite_bombermanB3(31) <= "00000000000000000000000000000000";

--bombermanB1 body--
sprite_bombermanB4(0)    <= "00000000000000000000000000000000";
sprite_bombermanB4(1)    <= "00000000000000000000000000000000";
sprite_bombermanB4(2)    <= "00000000000000000000000000000000";
sprite_bombermanB4(3)    <= "00000000000000000000000000000000";
sprite_bombermanB4(4)    <= "00000000000000000000000000000000";
sprite_bombermanB4(5)    <= "00000000000000000000000000000000";
sprite_bombermanB4(6)    <= "00000000000000000000000000000000";
sprite_bombermanB4(7)    <= "00000000000000000000000000000000";
sprite_bombermanB4(8)    <= "00000000000000000000000000000000";
sprite_bombermanB4(9)    <= "00000000000000000000000000000000";
sprite_bombermanB4(10) <= "00000000000000000000000000000000";
sprite_bombermanB4(11) <= "00000000000000000000000000000000";
```

```
sprite_bombermanB4(12) <= "00000000000000000000000000000000";
sprite_bombermanB4(13) <= "00000000000000000000000000000000";
sprite_bombermanB4(14) <= "00000000000000000000000000000000";
sprite_bombermanB4(15) <= "00000000000000000000000000000000";
sprite_bombermanB4(16) <= "00000000000011111111100000000000";
sprite_bombermanB4(17) <= "00000000001111111111111000000000";
sprite_bombermanB4(18) <= "00000000001111111111111000000000";
sprite_bombermanB4(19) <= "00000000001111111111111000000000";
sprite_bombermanB4(20) <= "00000000001111111111111000000000";
sprite_bombermanB4(21) <= "00000000000111111111110000000000";
sprite_bombermanB4(22) <= "00000000000001111111000000000000";
sprite_bombermanB4(23) <= "00000000000001111111000000000000";
sprite_bombermanB4(24) <= "00000000000000000000000000000000";
sprite_bombermanB4(25) <= "00000000000000000000000000000000";
sprite_bombermanB4(26) <= "00000000000000000000000000000000";
sprite_bombermanB4(27) <= "00000000000000000000000000000000";
sprite_bombermanB4(28) <= "00000000000000000000000000000000";
sprite_bombermanB4(29) <= "00000000000000000000000000000000";
sprite_bombermanB4(30) <= "00000000000000000000000000000000";
sprite_bombermanB4(31) <= "00000000000000000000000000000000";

--bombermanL1 outside--
sprite_bombermanL0(0)  <= "00000000000000000000000000000000";
sprite_bombermanL0(1)  <= "00000000000001111111100000000000";
sprite_bombermanL0(2)  <= "00000000011100000000011011110000";
sprite_bombermanL0(3)  <= "00000001100000000000000100001000";
sprite_bombermanL0(4)  <= "00000010000000000000000010001000";
sprite_bombermanL0(5)  <= "00000010000000000000000001000100";
sprite_bombermanL0(6)  <= "00000010000000000000000001001000";
sprite_bombermanL0(7)  <= "00000010000000000000000000110000";
sprite_bombermanL0(8)  <= "00000010001000000000000000100000";
sprite_bombermanL0(9)  <= "00000010010000000000000000100000";
sprite_bombermanL0(10) <= "00000010010000000000000000100000";
sprite_bombermanL0(11) <= "00000010010000000000000001000000";
sprite_bombermanL0(12) <= "00000010010000000000000001000000";
sprite_bombermanL0(13) <= "00000010000000000000000010000000";
sprite_bombermanL0(14) <= "00000001000000000000000100000000";
sprite_bombermanL0(15) <= "00000000010000000000111000000000";
```

```
sprite_bombermanL0(16) <= "00000000100000000000100000000000";
sprite_bombermanL0(17) <= "00000000100000000000100000000000";
sprite_bombermanL0(18) <= "00000000110000000110100000000000";
sprite_bombermanL0(19) <= "00000000110000000110100000000000";
sprite_bombermanL0(20) <= "00000000100000000000100000000000";
sprite_bombermanL0(21) <= "00000000100000000000100000000000";
sprite_bombermanL0(22) <= "00000000010000000001000000000000";
sprite_bombermanL0(23) <= "00000000001110000010000000000000";
sprite_bombermanL0(24) <= "00000000011000000001100000000000";
sprite_bombermanL0(25) <= "00000000110000000000111000000000";
sprite_bombermanL0(26) <= "00000001110000000000111110000000";
sprite_bombermanL0(27) <= "00000001111000000001111110000000";
sprite_bombermanL0(28) <= "00000000011111111111111000000000";
sprite_bombermanL0(29) <= "00000000001111111111100000000000";
sprite_bombermanL0(30) <= "00000000000000000000000000000000";
sprite_bombermanL0(31) <= "00000000000000000000000000000000";

--bombermanL1 shoes and gloves--
sprite_bombermanL1(0)  <= "00000000000000000000000000000000";
sprite_bombermanL1(1)  <= "00000000000000000000000000000000";
sprite_bombermanL1(2)  <= "00000000000000000000000000000000";
sprite_bombermanL1(3)  <= "00000000000000000000000001111000";
sprite_bombermanL1(4)  <= "00000000000000000000000001111000";
sprite_bombermanL1(5)  <= "00000000000000000000000000111100";
sprite_bombermanL1(6)  <= "00000000000000000000000000011000";
sprite_bombermanL1(7)  <= "00000000111110000000000000000000";
sprite_bombermanL1(8)  <= "00000000000001000000000000000000";
sprite_bombermanL1(9)  <= "00000000000001000000000000000000";
sprite_bombermanL1(10) <= "00000000000000010000000000000000";
sprite_bombermanL1(11) <= "00000000000001000000000000000000";
sprite_bombermanL1(12) <= "00000000000001000000000000000000";
sprite_bombermanL1(13) <= "00000000111110000000000000000000";
sprite_bombermanL1(14) <= "00000000000000000000000000000000";
sprite_bombermanL1(15) <= "00000000000000000000000000000000";
sprite_bombermanL1(16) <= "00000000000000000000000000000000";
sprite_bombermanL1(17) <= "00000000000000000000000000000000";
sprite_bombermanL1(18) <= "00000000001100000000000000000000";
sprite_bombermanL1(19) <= "00000000001100000000000000000000";
```

```
sprite_bombermanL1(20) <= "00000000000001111100000000000000";
sprite_bombermanL1(21) <= "00000000000011111110000000000000";
sprite_bombermanL1(22) <= "00000000000001111100000000000000";
sprite_bombermanL1(23) <= "00000000000000000000000000000000";
sprite_bombermanL1(24) <= "00000000000000000000000000000000";
sprite_bombermanL1(25) <= "00000000000011111110000000000000";
sprite_bombermanL1(26) <= "00000000000111111110000000000000";
sprite_bombermanL1(27) <= "00000000000111111100000000000000";
sprite_bombermanL1(28) <= "00000000000000000000000000000000";
sprite_bombermanL1(29) <= "00000000000000000000000000000000";
sprite_bombermanL1(30) <= "00000000000000000000000000000000";
sprite_bombermanL1(31) <= "00000000000000000000000000000000";

--bombermanL1 skin--
sprite_bombermanL2(0)  <= "00000000000000000000000000000000";
sprite_bombermanL2(1)  <= "00000000000000000000000000000000";
sprite_bombermanL2(2)  <= "00000000000000000000000000000000";
sprite_bombermanL2(3)  <= "00000000000000000000000000000000";
sprite_bombermanL2(4)  <= "00000000000000000000000000000000";
sprite_bombermanL2(5)  <= "00000000000000000000000000000000";
sprite_bombermanL2(6)  <= "00000000000000000000000000000000";
sprite_bombermanL2(7)  <= "00000000000000000000000000000000";
sprite_bombermanL2(8)  <= "00000000111110000000000000000000";
sprite_bombermanL2(9)  <= "00000001111111000000000000000000";
sprite_bombermanL2(10) <= "00000001111111100000000000000000";
sprite_bombermanL2(11) <= "00000001111111000000000000000000";
sprite_bombermanL2(12) <= "00000000111110000000000000000000";
sprite_bombermanL2(13) <= "00000000000000000000000000000000";
sprite_bombermanL2(14) <= "00000000000000000000000000000000";
sprite_bombermanL2(15) <= "00000000000000000000000000000000";
sprite_bombermanL2(16) <= "00000000000000000000000000000000";
sprite_bombermanL2(17) <= "00000000000000111000000000000000";
sprite_bombermanL2(18) <= "00000000000000111000000000000000";
sprite_bombermanL2(19) <= "00000000000000111000000000000000";
sprite_bombermanL2(20) <= "00000000000000000000000000000000";
sprite_bombermanL2(21) <= "00000000000000000000000000000000";
sprite_bombermanL2(22) <= "00000000000000000000000000000000";
sprite_bombermanL2(23) <= "00000000000000111000000000000000";
```

```
sprite_bombermanL2(24) <= "00000000000000011100000000000000";
sprite_bombermanL2(25) <= "00000000000000000000000000000000";
sprite_bombermanL2(26) <= "00000000000000000000000000000000";
sprite_bombermanL2(27) <= "00000000000000000000000000000000";
sprite_bombermanL2(28) <= "00000000000000000000000000000000";
sprite_bombermanL2(29) <= "00000000000000000000000000000000";
sprite_bombermanL2(30) <= "00000000000000000000000000000000";
sprite_bombermanL2(31) <= "00000000000000000000000000000000";

--bombermanL1 helmet--
sprite_bombermanL3(0)  <= "00000000000000000000000000000000";
sprite_bombermanL3(1)  <= "00000000000000000000000000000000";
sprite_bombermanL3(2)  <= "00000000000011111111100000000000";
sprite_bombermanL3(3)  <= "00000000011111111111110000000000";
sprite_bombermanL3(4)  <= "00000001111111111111111100000000";
sprite_bombermanL3(5)  <= "00000001111111111111111110000000";
sprite_bombermanL3(6)  <= "00000001111111111111111110000000";
sprite_bombermanL3(7)  <= "00000000000001111111111111000000";
sprite_bombermanL3(8)  <= "00000000000001111111111111000000";
sprite_bombermanL3(9)  <= "00000000000000011111111111000000";
sprite_bombermanL3(10) <= "00000000000000011111111111000000";
sprite_bombermanL3(11) <= "00000000000000011111111110000000";
sprite_bombermanL3(12) <= "00000000000001111111111110000000";
sprite_bombermanL3(13) <= "00000000000011111111111100000000";
sprite_bombermanL3(14) <= "00000000111111111111111000000000";
sprite_bombermanL3(15) <= "00000000011111111111000000000000";
sprite_bombermanL3(16) <= "00000000000000000000000000000000";
sprite_bombermanL3(17) <= "00000000000000000000000000000000";
sprite_bombermanL3(18) <= "00000000000000000000000000000000";
sprite_bombermanL3(19) <= "00000000000000000000000000000000";
sprite_bombermanL3(20) <= "00000000000000000000000000000000";
sprite_bombermanL3(21) <= "00000000000000000000000000000000";
sprite_bombermanL3(22) <= "00000000000000000000000000000000";
sprite_bombermanL3(23) <= "00000000000000000000000000000000";
sprite_bombermanL3(24) <= "00000000000000000000000000000000";
sprite_bombermanL3(25) <= "00000000000000000000000000000000";
sprite_bombermanL3(26) <= "00000000000000000000000000000000";
sprite_bombermanL3(27) <= "00000000000000000000000000000000";
```

```
sprite_bombermanL3(28) <= "00000000000000000000000000000000";
sprite_bombermanL3(29) <= "00000000000000000000000000000000";
sprite_bombermanL3(30) <= "00000000000000000000000000000000";
sprite_bombermanL3(31) <= "00000000000000000000000000000000";

--bombermanL1 body--
sprite_bombermanL4(0)  <= "00000000000000000000000000000000";
sprite_bombermanL4(1)  <= "00000000000000000000000000000000";
sprite_bombermanL4(2)  <= "00000000000000000000000000000000";
sprite_bombermanL4(3)  <= "00000000000000000000000000000000";
sprite_bombermanL4(4)  <= "00000000000000000000000000000000";
sprite_bombermanL4(5)  <= "00000000000000000000000000000000";
sprite_bombermanL4(6)  <= "00000000000000000000000000000000";
sprite_bombermanL4(7)  <= "00000000000000000000000000000000";
sprite_bombermanL4(8)  <= "00000000000000000000000000000000";
sprite_bombermanL4(9)  <= "00000000000000000000000000000000";
sprite_bombermanL4(10) <= "00000000000000000000000000000000";
sprite_bombermanL4(11) <= "00000000000000000000000000000000";
sprite_bombermanL4(12) <= "00000000000000000000000000000000";
sprite_bombermanL4(13) <= "00000000000000000000000000000000";
sprite_bombermanL4(14) <= "00000000000000000000000000000000";
sprite_bombermanL4(15) <= "00000000000000000000000000000000";
sprite_bombermanL4(16) <= "00000000011111111111000000000000";
sprite_bombermanL4(17) <= "00000000011111111111000000000000";
sprite_bombermanL4(18) <= "00000000011111111111000000000000";
sprite_bombermanL4(19) <= "00000000011111111111000000000000";
sprite_bombermanL4(20) <= "00000000111111111111000000000000";
sprite_bombermanL4(21) <= "00000000111111111111000000000000";
sprite_bombermanL4(22) <= "00000000011111111110000000000000";
sprite_bombermanL4(23) <= "00000000000000000000000000000000";
sprite_bombermanL4(24) <= "00000000000000000000000000000000";
sprite_bombermanL4(25) <= "00000000000000000000000000000000";
sprite_bombermanL4(26) <= "00000000000000000000000000000000";
sprite_bombermanL4(27) <= "00000000000000000000000000000000";
sprite_bombermanL4(28) <= "00000000000000000000000000000000";
sprite_bombermanL4(29) <= "00000000000000000000000000000000";
sprite_bombermanL4(30) <= "00000000000000000000000000000000";
sprite_bombermanL4(31) <= "00000000000000000000000000000000";
```

```
   --concrete code -- 111111
sprite_concrete0(0)    <= "00000000000000000000000000000000";
sprite_concrete0(1)    <= "00000000000000000000000000000000";
sprite_concrete0(2)    <= "00000000000000000000000000000000";
sprite_concrete0(3)    <= "00000000000000000000000000000000";
sprite_concrete0(4)    <= "00000000000000000000000000000000";
sprite_concrete0(5)    <= "00000000000000000000000000000000";
sprite_concrete0(6)    <= "00000000000000000000000000000000";
sprite_concrete0(7)    <= "00000000000000000000000000000000";
sprite_concrete0(8)    <= "00000000000000000000000000000000";
sprite_concrete0(9)    <= "00000000000000000000000000000000";
sprite_concrete0(10) <= "00000000000000000000000000000000";
sprite_concrete0(11) <= "00000000000000000000000000000000";
sprite_concrete0(12) <= "00000000000000000000000000000000";
sprite_concrete0(13) <= "00000000000000000000000000000000";
sprite_concrete0(14) <= "00000000000000000000000000000000";
sprite_concrete0(15) <= "00000000000000000000000000000000";
sprite_concrete0(16) <= "00000000000000000000000000000000";
sprite_concrete0(17) <= "00000000000000000000000000000000";
sprite_concrete0(18) <= "00000000000000000000000000000000";
sprite_concrete0(19) <= "00000000000000000000000000000000";
sprite_concrete0(20) <= "00000000000000000000000000000000";
sprite_concrete0(21) <= "00000000000000000000000000000000";
sprite_concrete0(22) <= "00000000000000000000000000000000";
sprite_concrete0(23) <= "11111111111111111111111111111110";
sprite_concrete0(24) <= "11111111111111111111111111111110";
sprite_concrete0(25) <= "11111111111111111111111111111110";
sprite_concrete0(26) <= "11111111111111111111111111111110";
sprite_concrete0(27) <= "11111111111111111111111111111110";
sprite_concrete0(28) <= "11111111111111111111111111111110";
sprite_concrete0(29) <= "11111111111111111111111111111110";
sprite_concrete0(30) <= "11111111111111111111111111111110";
sprite_concrete0(31) <= "11111111111111111111111111111110";


sprite_concrete1(0)    <= "11111111111111111111111111111111";
sprite_concrete1(1)    <= "11111111111111111111111111111111";
```

```
sprite_concrete1(2)    <= "11111111111111111111111111111111";
sprite_concrete1(3)    <= "11111111111111111111111111111111";
sprite_concrete1(4)    <= "11111111111111111111111111111111";
sprite_concrete1(5)    <= "11111111111111111111111111111111";
sprite_concrete1(6)    <= "11111111111111111111111111111111";
sprite_concrete1(7)    <= "11111111111111111111111111111111";
sprite_concrete1(8)    <= "11111111111111111111111111111111";
sprite_concrete1(9)    <= "11111111111111111111111111111111";
sprite_concrete1(10) <= "11111111111111111111111111111111";
sprite_concrete1(11) <= "11111111111111111111111111111111";
sprite_concrete1(12) <= "11111111111111111111111111111111";
sprite_concrete1(13) <= "11111111111111111111111111111111";
sprite_concrete1(14) <= "11111111111111111111111111111111";
sprite_concrete1(15) <= "11111111111111111111111111111111";
sprite_concrete1(16) <= "11111111111111111111111111111111";
sprite_concrete1(17) <= "11111111111111111111111111111111";
sprite_concrete1(18) <= "11111111111111111111111111111111";
sprite_concrete1(19) <= "11111111111111111111111111111111";
sprite_concrete1(20) <= "11111111111111111111111111111111";
sprite_concrete1(21) <= "11111111111111111111111111111111";
sprite_concrete1(22) <= "11111111111111111111111111111111";
sprite_concrete1(23) <= "11111111111111111111111111111111";
sprite_concrete1(24) <= "11111111111111111111111111111111";
sprite_concrete1(25) <= "11111111111111111111111111111111";
sprite_concrete1(26) <= "11111111111111111111111111111111";
sprite_concrete1(27) <= "11111111111111111111111111111111";
sprite_concrete1(28) <= "11111111111111111111111111111111";
sprite_concrete1(29) <= "11111111111111111111111111111111";
sprite_concrete1(30) <= "11111111111111111111111111111111";
sprite_concrete1(31) <= "11111111111111111111111111111111";


sprite_concrete2(0)    <= "11111111111111111111111111111111";
sprite_concrete2(1)    <= "10000000000000000000000000000001";
sprite_concrete2(2)    <= "10110000000000000000000000001101";
sprite_concrete2(3)    <= "10110000000000000000000000001101";
sprite_concrete2(4)    <= "10000000000000000000000000000001";
sprite_concrete2(5)    <= "10000111111111111111111111100001";
```

```
sprite_concrete2(6)    <= "10000100000000000000000000100001";
sprite_concrete2(7)    <= "10000101100000000000000110100001";
sprite_concrete2(8)    <= "10000101100000000000000110100001";
sprite_concrete2(9)    <= "10000100000000000000000000100001";
sprite_concrete2(10) <= "10000100000000000000000000100001";
sprite_concrete2(11) <= "10000100000000000000000000100001";
sprite_concrete2(12) <= "10000100000000000000000000100001";
sprite_concrete2(13) <= "10000100000000000000000000100001";
sprite_concrete2(14) <= "10000100000000000000000000100001";
sprite_concrete2(15) <= "10000101100000000000000110100001";
sprite_concrete2(16) <= "10000101100000000000000110100001";
sprite_concrete2(17) <= "10000100000000000000000000100001";
sprite_concrete2(18) <= "10000111111111111111111111100001";
sprite_concrete2(19) <= "10000000000000000000000000000001";
sprite_concrete2(20) <= "10110000000000000000000000001101";
sprite_concrete2(21) <= "10110000000000000000000000001101";
sprite_concrete2(22) <= "10000000000000000000000000000001";
sprite_concrete2(23) <= "11111111111111111111111111111110";
sprite_concrete2(24) <= "10000000000000000000000000000010";
sprite_concrete2(25) <= "10110000000000000000000000011010";
sprite_concrete2(26) <= "10000111111111111111111111000010";
sprite_concrete2(27) <= "10000100000000000000000001000010";
sprite_concrete2(28) <= "10000111111111111111111111000010";
sprite_concrete2(29) <= "10110000000000000000000000011010";
sprite_concrete2(30) <= "10000000000000000000000000000010";
sprite_concrete2(31) <= "11111111111111111111111111111111";

   --bomber code -- 000001
sprite_bomber0(0)    <= "11111111111111111111111111111111";
sprite_bomber0(1)    <= "10000000000000000000000000000001";
sprite_bomber0(2)    <= "10000000000000000000000000000001";
sprite_bomber0(3)    <= "10000000000000000000000000000001";
sprite_bomber0(4)    <= "10000000000111111111111000000001";
sprite_bomber0(5)    <= "10000000011111000111111000000001";
sprite_bomber0(6)    <= "10000000111111000111111000000001";
sprite_bomber0(7)    <= "10000001111111000111111000000001";
sprite_bomber0(8)    <= "10000011110001111111111111110001";
sprite_bomber0(9)    <= "10001111000011111111111111111001";
```

```
sprite_bomber0(10) <= "11111111000111111111111111111111";
sprite_bomber0(11) <= "10011111000111111111111111111101";
sprite_bomber0(12) <= "10011100000111111111111111111101";
sprite_bomber0(13) <= "10111100001111111111111111111111";
sprite_bomber0(14) <= "10111100111111111111111111111111";
sprite_bomber0(15) <= "10111100111111111111111111111111";
sprite_bomber0(16) <= "10111100111111111111111111111111";
sprite_bomber0(17) <= "10111110111111111111111111111111";
sprite_bomber0(18) <= "10111111111111111111111111111111";
sprite_bomber0(19) <= "10111111111111111111111111111111";
sprite_bomber0(20) <= "10111111111111111111111111111111";
sprite_bomber0(21) <= "11111111111111111111111111111111";
sprite_bomber0(22) <= "10111111111111111111111111111111";
sprite_bomber0(23) <= "10011111111111111111111111111111";
sprite_bomber0(24) <= "10001111111111111111111111111101";
sprite_bomber0(25) <= "10000111111111111111111111111001";
sprite_bomber0(26) <= "10000111111111111111111111110001";
sprite_bomber0(27) <= "10000011111111111111111111100001";
sprite_bomber0(28) <= "10000001111111111111111111000001";
sprite_bomber0(29) <= "10000000111111111111111100000001";
sprite_bomber0(30) <= "10000000011111111111111000000001";
sprite_bomber0(31) <= "11111111111111111111111111111111";


sprite_bomber1(0)  <= "11111111111111111111111111111111";
sprite_bomber1(1)  <= "11111111111111111111111111111111";
sprite_bomber1(2)  <= "11111111111111111111111111111111";
sprite_bomber1(3)  <= "11111111111111111111111111111111";
sprite_bomber1(4)  <= "11111111111000000000011111111111";
sprite_bomber1(5)  <= "11111111100000000000001111111111";
sprite_bomber1(6)  <= "11111111000000000000000000111111";
sprite_bomber1(7)  <= "11111111000000000000000000111111";
sprite_bomber1(8)  <= "11111100000000000000000000011111";
sprite_bomber1(9)  <= "11110000000000000000000000000111";
sprite_bomber1(10) <= "11110000000000000000000000000111";
sprite_bomber1(11) <= "11110000000000000000000000000111";
sprite_bomber1(12) <= "11110000000000000000000000000111";
sprite_bomber1(13) <= "11000000000000000000000000000001";
```

```
sprite_bomber1(14) <= "11000000000000000000000000000001";
sprite_bomber1(15) <= "11000000000000000000000000000001";
sprite_bomber1(16) <= "11000000000000000000000000000001";
sprite_bomber1(17) <= "11000000000000000000000000000001";
sprite_bomber1(18) <= "11000000000000000000000000000001";
sprite_bomber1(19) <= "11000000000000000000000000000001";
sprite_bomber1(20) <= "11000000000000000000000000000001";
sprite_bomber1(21) <= "11110000000000000000000000000011";
sprite_bomber1(22) <= "11110000000000000000000000000111";
sprite_bomber1(23) <= "11110000000000000000000000000111";
sprite_bomber1(24) <= "11110000000000000000000000000111";
sprite_bomber1(25) <= "11111100000000000000000000011111";
sprite_bomber1(26) <= "11111100000000000000000000011111";
sprite_bomber1(27) <= "11111100000000000000000000011111";
sprite_bomber1(28) <= "11111111000000000000000001111111";
sprite_bomber1(29) <= "11111111000000000000000011111111";
sprite_bomber1(30) <= "11111111111111111111111111111111";
sprite_bomber1(31) <= "11111111111111111111111111111111";


sprite_bomber2(0)  <= "00000000000000000000000000000000";
sprite_bomber2(1)  <= "00000000000000000000000000000000";
sprite_bomber2(2)  <= "00000000000000000000000011100000";
sprite_bomber2(3)  <= "00000000000000000000000011100000";
sprite_bomber2(4)  <= "00000000000000000000000111100000";
sprite_bomber2(5)  <= "00000000000000111000000111100000";
sprite_bomber2(6)  <= "00000000000000111000001111000000";
sprite_bomber2(7)  <= "00000000000000111000011110000000";
sprite_bomber2(8)  <= "00000000001110000000111100000000";
sprite_bomber2(9)  <= "00000000111100000001111000000000";
sprite_bomber2(10) <= "00000000111000000011100000000000";
sprite_bomber2(11) <= "00000000111000000000000000000000";
sprite_bomber2(12) <= "00000011111000000000000000000000";
sprite_bomber2(13) <= "00000011110000000000000000000000";
sprite_bomber2(14) <= "00000011000000000000000000000000";
sprite_bomber2(15) <= "00000011000000000000000000000000";
sprite_bomber2(16) <= "00000011000000000000000000000000";
sprite_bomber2(17) <= "00000001000000000000000000000000";
```

```
sprite_bomber2(18) <= "00000000000000000000000000000000";
sprite_bomber2(19) <= "00000000000000000000000000000000";
sprite_bomber2(20) <= "00000000000000000000000000000000";
sprite_bomber2(21) <= "00000000000000000000000000000000";
sprite_bomber2(22) <= "00000000000000000000000000000000";
sprite_bomber2(23) <= "00000000000000000000000000000000";
sprite_bomber2(24) <= "00000000000000000000000000000000";
sprite_bomber2(25) <= "00000000000000000000000000000000";
sprite_bomber2(26) <= "00000000000000000000000000000000";
sprite_bomber2(27) <= "00000000000000000000000000000000";
sprite_bomber2(28) <= "00000000000000000000000000000000";
sprite_bomber2(29) <= "00000000000000000000000000000000";
sprite_bomber2(30) <= "00000000000000000000000000000000";
sprite_bomber2(31) <= "00000000000000000000000000000000";

sprite_bomber3(0)  <= "00000000000000000000000011100000";
sprite_bomber3(1)  <= "00000000000000000000000111110000";
sprite_bomber3(2)  <= "00000000000000000000001111111000";
sprite_bomber3(3)  <= "00000000000000000000001111111000";
sprite_bomber3(4)  <= "00000000000000000000000111110000";
sprite_bomber3(5)  <= "00000000000000011000000011100000";
sprite_bomber3(6)  <= "00000000000000011110000000000000";
sprite_bomber3(7)  <= "00000000000000001100000000000000";
sprite_bomber3(8)  <= "00000000000000000000000000000000";
sprite_bomber3(9)  <= "00000000000000000000000000000000";
sprite_bomber3(10) <= "00000000000000000000000000000000";
sprite_bomber3(11) <= "00000000000000000000000000000000";
sprite_bomber3(12) <= "00000000000000000000000000000000";
sprite_bomber3(13) <= "00000000000000000000000000000000";
sprite_bomber3(14) <= "00000000000000000000000000000000";
sprite_bomber3(15) <= "00000000000000000000000000000000";
sprite_bomber3(16) <= "00000000000000000000000000000000";
sprite_bomber3(17) <= "00000000000000000000000000000000";
sprite_bomber3(18) <= "00000000000000000000000000000000";
sprite_bomber3(19) <= "00000000000000000000000000000000";
sprite_bomber3(20) <= "00000000000000000000000000000000";
sprite_bomber3(21) <= "00000000000000000000000000000000";
sprite_bomber3(22) <= "00000000000000000000000000000000";
```

```
sprite_bomber3(23) <= "00000000000000000000000000000000";
sprite_bomber3(24) <= "00000000000000000000000000000000";
sprite_bomber3(25) <= "00000000000000000000000000000000";
sprite_bomber3(26) <= "00000000000000000000000000000000";
sprite_bomber3(27) <= "00000000000000000000000000000000";
sprite_bomber3(28) <= "00000000000000000000000000000000";
sprite_bomber3(29) <= "00000000000000000000000000000000";
sprite_bomber3(30) <= "00000000000000000000000000000000";
sprite_bomber3(31) <= "00000000000000000000000000000000";


   --fire code -- 000010
sprite_fire0(0)    <= "00111100000000000000000000111100";
sprite_fire0(1)    <= "01111000000000000000000000011110";
sprite_fire0(2)    <= "11110000000000000000000000001111";
sprite_fire0(3)    <= "11100000000000000000000000000111";
sprite_fire0(4)    <= "11000000000000000000000000000011";
sprite_fire0(5)    <= "10000000000000000000000000000001";
sprite_fire0(6)    <= "00000000000000000000000000000000";
sprite_fire0(7)    <= "00000000000000000000000000000000";
sprite_fire0(8)    <= "00000000000000000000000000000000";
sprite_fire0(9)    <= "00000000000000000000000000000000";
sprite_fire0(10) <= "00000000000000000000000000000000";
sprite_fire0(11) <= "00000000000000000000000000000000";
sprite_fire0(12) <= "00000000000000000000000000000000";
sprite_fire0(13) <= "00000000000000000000000000000000";
sprite_fire0(14) <= "00000000000000000000000000000000";
sprite_fire0(15) <= "00000000000000000000000000000000";
sprite_fire0(16) <= "00000000000000000000000000000000";
sprite_fire0(17) <= "00000000000000000000000000000000";
sprite_fire0(18) <= "00000000000000000000000000000000";
sprite_fire0(19) <= "00000000000000000000000000000000";
sprite_fire0(20) <= "00000000000000000000000000000000";
sprite_fire0(21) <= "00000000000000000000000000000000";
sprite_fire0(22) <= "00000000000000000000000000000000";
sprite_fire0(23) <= "00000000000000000000000000000000";
sprite_fire0(24) <= "00000000000000000000000000000000";
sprite_fire0(25) <= "00000000000000000000000000000000";
```

```
sprite_fire0(26) <= "10000000000000000000000000000001";
sprite_fire0(27) <= "11000000000000000000000000000011";
sprite_fire0(28) <= "11100000000000000000000000000111";
sprite_fire0(29) <= "11110000000000000000000000001111";
sprite_fire0(30) <= "01111000000000000000000000011110";
sprite_fire0(31) <= "00111100000000000000000000111100";


sprite_fire1(0)  <= "11000011000000000000000011000011";
sprite_fire1(1)  <= "10000110000000000000000001100001";
sprite_fire1(2)  <= "00001100000000000000000000110000";
sprite_fire1(3)  <= "00011000000000000000000000011000";
sprite_fire1(4)  <= "00110000000000000000000000001100";
sprite_fire1(5)  <= "01100000000000000000000000000110";
sprite_fire1(6)  <= "11000000000000000000000000000011";
sprite_fire1(7)  <= "10000000000000000000000000000001";
sprite_fire1(8)  <= "00000000000000000000000000000000";
sprite_fire1(9)  <= "00000000000000000000000000000000";
sprite_fire1(10) <= "00000000000000000000000000000000";
sprite_fire1(11) <= "00000000000000000000000000000000";
sprite_fire1(12) <= "00000000000000000000000000000000";
sprite_fire1(13) <= "00000000000000000000000000000000";
sprite_fire1(14) <= "00000000000000000000000000000000";
sprite_fire1(15) <= "00000000000000000000000000000000";
sprite_fire1(16) <= "00000000000000000000000000000000";
sprite_fire1(17) <= "00000000000000000000000000000000";
sprite_fire1(18) <= "00000000000000000000000000000000";
sprite_fire1(19) <= "00000000000000000000000000000000";
sprite_fire1(20) <= "00000000000000000000000000000000";
sprite_fire1(21) <= "00000000000000000000000000000000";
sprite_fire1(22) <= "00000000000000000000000000000000";
sprite_fire1(23) <= "00000000000000000000000000000000";
sprite_fire1(24) <= "10000000000000000000000000000001";
sprite_fire1(25) <= "11000000000000000000000000000011";
sprite_fire1(26) <= "01100000000000000000000000000110";
sprite_fire1(27) <= "00110000000000000000000000001100";
sprite_fire1(28) <= "00011000000000000000000000011000";
sprite_fire1(29) <= "00001100000000000000000000110000";
```

```
sprite_fire1(30) <= "10000110000000000000000001100001";
sprite_fire1(31) <= "11000011000000000000000011000011";

--fire2 uses concrete 1 pattern

sprite_fireM0(0)  <= "11111111111111111111111111111111";
sprite_fireM0(1)  <= "11111111111111111111111111111111";
sprite_fireM0(2)  <= "00000000000000000000000000000000";
sprite_fireM0(3)  <= "00000000000000000000000000000000";
sprite_fireM0(4)  <= "00000000000000000000000000000000";
sprite_fireM0(5)  <= "00000000000000000000000000000000";
sprite_fireM0(6)  <= "00000000000000000000000000000000";
sprite_fireM0(7)  <= "00000000000000000000000000000000";
sprite_fireM0(8)  <= "00000000000000000000000000000000";
sprite_fireM0(9)  <= "00000000000000000000000000000000";
sprite_fireM0(10) <= "00000000000000000000000000000000";
sprite_fireM0(11) <= "00000000000000000000000000000000";
sprite_fireM0(12) <= "00000000000000000000000000000000";
sprite_fireM0(13) <= "00000000000000000000000000000000";
sprite_fireM0(14) <= "00000000000000000000000000000000";
sprite_fireM0(15) <= "00000000000000000000000000000000";
sprite_fireM0(16) <= "00000000000000000000000000000000";
sprite_fireM0(17) <= "00000000000000000000000000000000";
sprite_fireM0(18) <= "00000000000000000000000000000000";
sprite_fireM0(19) <= "00000000000000000000000000000000";
sprite_fireM0(20) <= "00000000000000000000000000000000";
sprite_fireM0(21) <= "00000000000000000000000000000000";
sprite_fireM0(22) <= "00000000000000000000000000000000";
sprite_fireM0(23) <= "00000000000000000000000000000000";
sprite_fireM0(24) <= "00000000000000000000000000000000";
sprite_fireM0(25) <= "00000000000000000000000000000000";
sprite_fireM0(26) <= "00000000000000000000000000000000";
sprite_fireM0(27) <= "00000000000000000000000000000000";
sprite_fireM0(28) <= "00000000000000000000000000000000";
sprite_fireM0(29) <= "00000000000000000000000000000000";
sprite_fireM0(30) <= "11111111111111111111111111111111";
sprite_fireM0(31) <= "11111111111111111111111111111111";
```

```
sprite_fireM1(0)    <= "00000000000000000000000000000000";
sprite_fireM1(1)    <= "00000000000000000000000000000000";
sprite_fireM1(2)    <= "11111111111111111111111111111111";
sprite_fireM1(3)    <= "11111111111111111111111111111111";
sprite_fireM1(4)    <= "11111111111111111111111111111111";
sprite_fireM1(5)    <= "11111111111111111111111111111111";
sprite_fireM1(6)    <= "00000000000000000000000000000000";
sprite_fireM1(7)    <= "00000000000000000000000000000000";
sprite_fireM1(8)    <= "00000000000000000000000000000000";
sprite_fireM1(9)    <= "00000000000000000000000000000000";
sprite_fireM1(10) <= "00000000000000000000000000000000";
sprite_fireM1(11) <= "00000000000000000000000000000000";
sprite_fireM1(12) <= "00000000000000000000000000000000";
sprite_fireM1(13) <= "00000000000000000000000000000000";
sprite_fireM1(14) <= "00000000000000000000000000000000";
sprite_fireM1(15) <= "00000000000000000000000000000000";
sprite_fireM1(16) <= "00000000000000000000000000000000";
sprite_fireM1(17) <= "00000000000000000000000000000000";
sprite_fireM1(18) <= "00000000000000000000000000000000";
sprite_fireM1(19) <= "00000000000000000000000000000000";
sprite_fireM1(20) <= "00000000000000000000000000000000";
sprite_fireM1(21) <= "00000000000000000000000000000000";
sprite_fireM1(22) <= "00000000000000000000000000000000";
sprite_fireM1(23) <= "00000000000000000000000000000000";
sprite_fireM1(24) <= "00000000000000000000000000000000";
sprite_fireM1(25) <= "00000000000000000000000000000000";
sprite_fireM1(26) <= "11111111111111111111111111111111";
sprite_fireM1(27) <= "11111111111111111111111111111111";
sprite_fireM1(28) <= "11111111111111111111111111111111";
sprite_fireM1(29) <= "11111111111111111111111111111111";
sprite_fireM1(30) <= "00000000000000000000000000000000";
sprite_fireM1(31) <= "00000000000000000000000000000000";

--fireM2 uses concrete 1 pattern

--brick code -- 000011
sprite_brick0(0)    <= "00000000000000000000000000000000";
```

```
sprite_brick0(1)    <= "00000000000000000000000000000000";
sprite_brick0(2)    <= "00000000000000000000000000000000";
sprite_brick0(3)    <= "00000000000000000000000000000000";
sprite_brick0(4)    <= "00000000000000000000000000000000";
sprite_brick0(5)    <= "00000000000000000000000000000000";
sprite_brick0(6)    <= "00000000000000000000000000000000";
sprite_brick0(7)    <= "00000000000000000000000000000000";
sprite_brick0(8)    <= "00000000000000000000000000000000";
sprite_brick0(9)    <= "00000000000000000000000000000000";
sprite_brick0(10) <= "00000000000000000000000000000000";
sprite_brick0(11) <= "00000000000000000000000000000000";
sprite_brick0(12) <= "00000000000000000000000000000000";
sprite_brick0(13) <= "00000000000000000000000000000000";
sprite_brick0(14) <= "00000000000000000000000000000000";
sprite_brick0(15) <= "00000000000000000000000000000000";
sprite_brick0(16) <= "00000000000000000000000000000000";
sprite_brick0(17) <= "00000000000000000000000000000000";
sprite_brick0(18) <= "00000000000000000000000000000000";
sprite_brick0(19) <= "00000000000000000000000000000000";
sprite_brick0(20) <= "00000000000000000000000000000000";
sprite_brick0(21) <= "00000000000000000000000000000000";
sprite_brick0(22) <= "00000000000000000000000000000000";
sprite_brick0(23) <= "11111111111111111111111111111110";
sprite_brick0(24) <= "11111111111111111111111111111110";
sprite_brick0(25) <= "11111111111111111111111111111110";
sprite_brick0(26) <= "11111111111111111111111111111110";
sprite_brick0(27) <= "11111111111111111111111111111110";
sprite_brick0(28) <= "11111111111111111111111111111110";
sprite_brick0(29) <= "11111111111111111111111111111110";
sprite_brick0(30) <= "11111111111111111111111111111110";
sprite_brick0(31) <= "11111111111111111111111111111110";

--brick1 uses concrete 1 pattern


sprite_brick2(0)    <= "11111111111111111111111111111111";
sprite_brick2(1)    <= "10000000000000000000000000000001";
sprite_brick2(2)    <= "10000000000000000000000000000001";
```

```
sprite_brick2(3)    <= "10000000000000000000000000000001";
sprite_brick2(4)    <= "10000000000000000000000000000001";
sprite_brick2(5)    <= "10000111111111111111111111100001";
sprite_brick2(6)    <= "10000100000000100010000000100001";
sprite_brick2(7)    <= "10000100000000010100000000100001";
sprite_brick2(8)    <= "10000110000000001000000000100001";
sprite_brick2(9)    <= "10000101000000000100000000100001";
sprite_brick2(10) <= "10000100100000000010000000100001";
sprite_brick2(11) <= "10000100010000000001000000100001";
sprite_brick2(12) <= "10000100001000000000100000100001";
sprite_brick2(13) <= "10000100000100000000010000100001";
sprite_brick2(14) <= "10000100000101000000000001000100001";
sprite_brick2(15) <= "10000100010001000000000100100001";
sprite_brick2(16) <= "10000100100000100000000010100001";
sprite_brick2(17) <= "10000101000000010000000001100001";
sprite_brick2(18) <= "10000111111111111111111111100001";
sprite_brick2(19) <= "10000000000000000000000000000001";
sprite_brick2(20) <= "10000000000000000000000000000001";
sprite_brick2(21) <= "10000000000000000000000000000001";
sprite_brick2(22) <= "10000000000000000000000000000001";
sprite_brick2(23) <= "11111111111111111111111111111110";
sprite_brick2(24) <= "10000000001000000000010000000010";
sprite_brick2(25) <= "10000000001000000000010000000010";
sprite_brick2(26) <= "10000000001000000000010000000010";
sprite_brick2(27) <= "10000000001000000000010000000010";
sprite_brick2(28) <= "10000000001000000000010000000010";
sprite_brick2(29) <= "10000000001000000000010000000010";
sprite_brick2(30) <= "10000000001000000000010000000010";
sprite_brick2(31) <= "11111111111111111111111111111111";

   --background code -- 000000
--background0 uses concrete 1 pattern


sprite_background1(0)    <= "11111111111111111111111111111111";
sprite_background1(1)    <= "10000000000000000000000000000001";
sprite_background1(2)    <= "10000000000000000000000000000001";
sprite_background1(3)    <= "10000000000000000000000000000001";
```

```
sprite_background1(4)    <= "10000000000000000000000000000001";
sprite_background1(5)    <= "10000000000000000000000000000001";
sprite_background1(6)    <= "10000000000000000000000000000001";
sprite_background1(7)    <= "10000000000000000000000000000001";
sprite_background1(8)    <= "10000000000000000000000000000001";
sprite_background1(9)    <= "10000000000000000000000000000001";
sprite_background1(10) <= "11111111111111111111111111111111";
sprite_background1(11) <= "10000000000000000000000000000001";
sprite_background1(12) <= "10000000000000000000000000000001";
sprite_background1(13) <= "10000000000000000000000000000001";
sprite_background1(14) <= "10000000000000000000000000000001";
sprite_background1(15) <= "10000000000000000000000000000001";
sprite_background1(16) <= "10000000000000000000000000000001";
sprite_background1(17) <= "10000000000000000000000000000001";
sprite_background1(18) <= "10000000000000000000000000000001";
sprite_background1(19) <= "10000000000000000000000000000001";
sprite_background1(20) <= "10000000000000000000000000000001";
sprite_background1(21) <= "11111111111111111111111111111111";
sprite_background1(22) <= "10000000000000000000000000000001";
sprite_background1(23) <= "10000000000000000000000000000001";
sprite_background1(24) <= "10000000000000000000000000000001";
sprite_background1(25) <= "10000000000000000000000000000001";
sprite_background1(26) <= "10000000000000000000000000000001";
sprite_background1(27) <= "10000000000000000000000000000001";
sprite_background1(28) <= "10000000000000000000000000000001";
sprite_background1(29) <= "10000000000000000000000000000001";
sprite_background1(30) <= "10000000000000000000000000000001";
sprite_background1(31) <= "11111111111111111111111111111111";

    --powerup code -- 000100
sprite_powerup0(0)    <= "00000000000000000000000000000000";
sprite_powerup0(1)    <= "00000000000000000000000000000000";
sprite_powerup0(2)    <= "00000000000000000111111111111100";
sprite_powerup0(3)    <= "00000000000000011001110011001100";
sprite_powerup0(4)    <= "00000000000000110001100010001100";
sprite_powerup0(5)    <= "00000000000111100001000010001100";
sprite_powerup0(6)    <= "00000000011000000000000000001100";
sprite_powerup0(7)    <= "00000000111000000000000000001100";
```

```
sprite_powerup0(8)    <= "00000011100000000000000000001100";
sprite_powerup0(9)    <= "00000110000000000000000000001100";
sprite_powerup0(10) <= "00001100000000000000000000001100";
sprite_powerup0(11) <= "00011000000000000000000000001100";
sprite_powerup0(12) <= "00011000000000000000000000001100";
sprite_powerup0(13) <= "00011000000011000001100000001100";
sprite_powerup0(14) <= "00110000000011000001100000001100";
sprite_powerup0(15) <= "00110000000011000001100000001100";
sprite_powerup0(16) <= "00110000000011000001100000001100";
sprite_powerup0(17) <= "00110000000011000001100000001100";
sprite_powerup0(18) <= "00110000000011000001100000001100";
sprite_powerup0(19) <= "00110000000011000001100000001100";
sprite_powerup0(20) <= "00110000000000000000000000001100";
sprite_powerup0(21) <= "00110000000000000000000000001100";
sprite_powerup0(22) <= "00110000000111111111111000011000";
sprite_powerup0(23) <= "00001100000001111111100000110000";
sprite_powerup0(24) <= "00001100000001100001100001100000";
sprite_powerup0(25) <= "00001100000000110011000011000000";
sprite_powerup0(26) <= "00000110000000011110000110000000";
sprite_powerup0(27) <= "00000011000000000000001100000000";
sprite_powerup0(28) <= "00000001100000000000011000000000";
sprite_powerup0(29) <= "00000000011111111111110000000000";
sprite_powerup0(30) <= "00000000000000000000000000000000";
sprite_powerup0(31) <= "00000000000000000000000000000000";


sprite_powerup1(0)    <= "00000000000000000000000000000000";
sprite_powerup1(1)    <= "00000000000000000000000000000000";
sprite_powerup1(2)    <= "00111111111111111000000000000000";
sprite_powerup1(3)    <= "00111111111111100110001100110000";
sprite_powerup1(4)    <= "00111111111111001110001101110000";
sprite_powerup1(5)    <= "00111111111000011110011101110000";
sprite_powerup1(6)    <= "00111111110011111110111101110000";
sprite_powerup1(7)    <= "00111111000111111111111111110000";
sprite_powerup1(8)    <= "00111100011111111111111111110000";
sprite_powerup1(9)    <= "00111001111111111111111111110000";
sprite_powerup1(10) <= "00110011111111111111111111110000";
sprite_powerup1(11) <= "00100111111111111111111111110000";
```

```
sprite_powerup1(12) <= "00100111111111111111111111110000";
sprite_powerup1(13) <= "00100111111100111110011111110000";
sprite_powerup1(14) <= "00001111111100111110011111110000";
sprite_powerup1(15) <= "00001111111100111110011111110000";
sprite_powerup1(16) <= "00001111111100111110011111110000";
sprite_powerup1(17) <= "00001111111100111110011111110000";
sprite_powerup1(18) <= "00001111111100111110011111110000";
sprite_powerup1(19) <= "00001111111100111110011111110000";
sprite_powerup1(20) <= "00001111111111111111111111110000";
sprite_powerup1(21) <= "00001111111111111111111111110000";
sprite_powerup1(22) <= "00001111111000000000000111110000";
sprite_powerup1(23) <= "00110011111110000000011111100100";
sprite_powerup1(24) <= "00110011111110000000011111001100";
sprite_powerup1(25) <= "00110011111111000000111100111100";
sprite_powerup1(26) <= "00111100111111100001111001111100";
sprite_powerup1(27) <= "00111110011111111111110011111100";
sprite_powerup1(28) <= "00111111001111111111100111111100";
sprite_powerup1(29) <= "00111111100000000000001111111100";
sprite_powerup1(30) <= "00000000000000000000000000000000";
sprite_powerup1(31) <= "00000000000000000000000000000000";


sprite_powerup2(0)  <= "11111111111111111111111111111111";
sprite_powerup2(1)  <= "11111111111111111111111111111111";
sprite_powerup2(2)  <= "11000000000000000000000000000011";
sprite_powerup2(3)  <= "11000000000000000000000000000011";
sprite_powerup2(4)  <= "11000000000000000000000000000011";
sprite_powerup2(5)  <= "11000000000000000000000000000011";
sprite_powerup2(6)  <= "11000000000000000000000000000011";
sprite_powerup2(7)  <= "11000000000000000000000000000011";
sprite_powerup2(8)  <= "11000000000000000000000000000011";
sprite_powerup2(9)  <= "11000000000000000000000000000011";
sprite_powerup2(10) <= "11000000000000000000000000000011";
sprite_powerup2(11) <= "11000000000000000000000000000011";
sprite_powerup2(12) <= "11000000000000000000000000000011";
sprite_powerup2(13) <= "11000000000000000000000000000011";
sprite_powerup2(14) <= "11000000000000000000000000000011";
sprite_powerup2(15) <= "11000000000000000000000000000011";
```

```
sprite_powerup2(16) <= "11000000000000000000000000000011";
sprite_powerup2(17) <= "11000000000000000000000000000011";
sprite_powerup2(18) <= "11000000000000000000000000000011";
sprite_powerup2(19) <= "11000000000000000000000000000011";
sprite_powerup2(20) <= "11000000000000000000000000000011";
sprite_powerup2(21) <= "11000000000000000000000000000011";
sprite_powerup2(22) <= "11000000000000000000000000000011";
sprite_powerup2(23) <= "11000000000000000000000000000011";
sprite_powerup2(24) <= "11000000000000011110000000000011";
sprite_powerup2(25) <= "11000000000000001100000000000011";
sprite_powerup2(26) <= "11000000000000000000000000000011";
sprite_powerup2(27) <= "11000000000000000000000000000011";
sprite_powerup2(28) <= "11000000000000000000000000000011";
sprite_powerup2(29) <= "11000000000000000000000000000011";
sprite_powerup2(30) <= "11111111111111111111111111111111";
sprite_powerup2(31) <= "11111111111111111111111111111111";

   --bombup code -- 000101
sprite_bombup0(0)   <= "00000000000000000000000000000000";
sprite_bombup0(1)   <= "00000000000000000000000000000000";
sprite_bombup0(2)   <= "00000000000000000000000100001000";
sprite_bombup0(3)   <= "00000000000000000000000100011000";
sprite_bombup0(4)   <= "00000000011111111111100100011000";
sprite_bombup0(5)   <= "00000000111111000111111000011000";
sprite_bombup0(6)   <= "00000001111111000111111000011000";
sprite_bombup0(7)   <= "00000011111111000111111000011000";
sprite_bombup0(8)   <= "00000111110001111111111001111000";
sprite_bombup0(9)   <= "00001111000011111111111011111000";
sprite_bombup0(10) <= "00001111000111111111111111111100";
sprite_bombup0(11) <= "00011111000111111111111111111000";
sprite_bombup0(12) <= "00011100000111111111111111111100";
sprite_bombup0(13) <= "00111100001111111111111111111110";
sprite_bombup0(14) <= "00111100111111111111111111111110";
sprite_bombup0(15) <= "00111100111111111111111111111110";
sprite_bombup0(16) <= "00111100111111111111111111111110";
sprite_bombup0(17) <= "00111110111111111111111111111110";
sprite_bombup0(18) <= "00111111111111111111111111111110";
sprite_bombup0(19) <= "00111111111111111111111111111110";
```

```
sprite_bombup0(20) <= "00111111111111111111111111111110";
sprite_bombup0(21) <= "00011111111111111111111111111100";
sprite_bombup0(22) <= "00011111111111111111111111111000";
sprite_bombup0(23) <= "00001111111111111111111111111000";
sprite_bombup0(24) <= "00001111111111111111111111111000";
sprite_bombup0(25) <= "00000111111111111111111111100000";
sprite_bombup0(26) <= "00000111111111111111111111100000";
sprite_bombup0(27) <= "00000011111111111111111111100000";
sprite_bombup0(28) <= "00000001111111111111111110000000";
sprite_bombup0(29) <= "00000000111111111111111100000000";
sprite_bombup0(30) <= "00000000000000000000000000000000";
sprite_bombup0(31) <= "00001010000000000000000000000100";


sprite_bombup1(0)  <= "11111111111111111111111111111111";
sprite_bombup1(1)  <= "11111111111111111111111111111111";
sprite_bombup1(2)  <= "11111111111111111111111011110111";
sprite_bombup1(3)  <= "11111111111111111111111010000111";
sprite_bombup1(4)  <= "11111111111000000000011010000111";
sprite_bombup1(5)  <= "11111111100000111000000110000111";
sprite_bombup1(6)  <= "11111111000000101000000000100111";
sprite_bombup1(7)  <= "11111111000000101000000000100111";
sprite_bombup1(8)  <= "11111100001010000000000010011111";
sprite_bombup1(9)  <= "11110000111100000000000100000111";
sprite_bombup1(10) <= "11110000001000000000000000000111";
sprite_bombup1(11) <= "11110000001000000000000000000111";
sprite_bombup1(12) <= "11110010001000000000000000000111";
sprite_bombup1(13) <= "11000000000000000000000000000001";
sprite_bombup1(14) <= "11000000000000000000000000000001";
sprite_bombup1(15) <= "11000000000000000000000000000001";
sprite_bombup1(16) <= "11000000000000000000000000000001";
sprite_bombup1(17) <= "11000000000000000000000000000001";
sprite_bombup1(18) <= "11000000000000000000000000000001";
sprite_bombup1(19) <= "11000000000000000000000000000001";
sprite_bombup1(20) <= "11000000000000000000000000000001";
sprite_bombup1(21) <= "11110000000000000000000000000011";
sprite_bombup1(22) <= "11110000000000000000000000000111";
sprite_bombup1(23) <= "11110000000000000000000000000111";
```

```
sprite_bombup1(24) <= "11110000000000000000000000000111";
sprite_bombup1(25) <= "11111100000000000000000000011111";
sprite_bombup1(26) <= "11111100000000000000000000011111";
sprite_bombup1(27) <= "11111100000000000000000000011111";
sprite_bombup1(28) <= "11111111000000000000000001111111";
sprite_bombup1(29) <= "11111111000000000000000011111111";
sprite_bombup1(30) <= "11111111111111111111111111111111";
sprite_bombup1(31) <= "11110101111111111111111111111011";


sprite_bombup2(0)  <= "00000000000000000000000000000000";
sprite_bombup2(1)  <= "00000000000000000000000000000000";
sprite_bombup2(2)  <= "00000000000000000000000011110000";
sprite_bombup2(3)  <= "00000000000000000000000011100000";
sprite_bombup2(4)  <= "00000000000000000000011011100000";
sprite_bombup2(5)  <= "00000000000000111000000111100000";
sprite_bombup2(6)  <= "00000000000000111000000111000000";
sprite_bombup2(7)  <= "00000000000000111000000111000000";
sprite_bombup2(8)  <= "00000000001110000000000100010000";
sprite_bombup2(9)  <= "00000000111100000000000000000000";
sprite_bombup2(10) <= "00000000111000000000000000000000";
sprite_bombup2(11) <= "00000000111000000000000000000000";
sprite_bombup2(12) <= "00000011111000000000000000000000";
sprite_bombup2(13) <= "00000011110000000000000000000000";
sprite_bombup2(14) <= "00000011000000000000000000000000";
sprite_bombup2(15) <= "00000011000000000000000000000000";
sprite_bombup2(16) <= "00000011000000000000000000000000";
sprite_bombup2(17) <= "00000001000000000000000000000000";
sprite_bombup2(18) <= "00000000000000000000000000000000";
sprite_bombup2(19) <= "00000000000000000000000000000000";
sprite_bombup2(20) <= "00000000000000000000000000000000";
sprite_bombup2(21) <= "00000000000000000000000000000000";
sprite_bombup2(22) <= "00000000000000000000000000000000";
sprite_bombup2(23) <= "00000000000000000000000000000000";
sprite_bombup2(24) <= "00000000000000000000000000000000";
sprite_bombup2(25) <= "00000000000000000000000000000000";
sprite_bombup2(26) <= "00000000000000000000000000000000";
sprite_bombup2(27) <= "00000000000000000000000000000000";
```

```
sprite_bombup2(28) <= "00000000000000000000000000000000";
sprite_bombup2(29) <= "00000000000000000000000000000000";
sprite_bombup2(30) <= "00000000000000000000000000000000";
sprite_bombup2(31) <= "00000000000000000000000000000000";



sprite_bombup3(0)  <= "11111111111111111111111111111111";
sprite_bombup3(1)  <= "11111111111111111111111111111111";
sprite_bombup3(2)  <= "11000000000000000000000000000011";
sprite_bombup3(3)  <= "11000000000000000000000000000011";
sprite_bombup3(4)  <= "11000000000000000000000000000011";
sprite_bombup3(5)  <= "11000000000000000000000000000011";
sprite_bombup3(6)  <= "11000000000000000000000000000011";
sprite_bombup3(7)  <= "11000000000000000000000000000011";
sprite_bombup3(8)  <= "11000000000000000000000000000011";
sprite_bombup3(9)  <= "11000000000000000000000000000011";
sprite_bombup3(10) <= "11000000000000000000000000000011";
sprite_bombup3(11) <= "11000000000000000000000000000011";
sprite_bombup3(12) <= "11000000000000000000000000000011";
sprite_bombup3(13) <= "11000000000000000000000000000011";
sprite_bombup3(14) <= "11000000000000000000000000000011";
sprite_bombup3(15) <= "11000000000000000000000000000011";
sprite_bombup3(16) <= "11000000000000000000000000000011";
sprite_bombup3(17) <= "11000000000000000000000000000011";
sprite_bombup3(18) <= "11000000000000000000000000000011";
sprite_bombup3(19) <= "11000000000000000000000000000011";
sprite_bombup3(20) <= "11000000000000000000000000000011";
sprite_bombup3(21) <= "11000000000000000000000000000011";
sprite_bombup3(22) <= "11000000000000000000000000000011";
sprite_bombup3(23) <= "11000000000000000000000000000011";
sprite_bombup3(24) <= "11000000000000000000000000000011";
sprite_bombup3(25) <= "11000000000000000000000000000011";
sprite_bombup3(26) <= "11000000000000000000000000000011";
sprite_bombup3(27) <= "11000000000000000000000000000011";
sprite_bombup3(28) <= "11000000000000000000000000000011";
sprite_bombup3(29) <= "11000000000000000000000000000011";
sprite_bombup3(30) <= "11111111111111111111111111111111";
```

```
sprite_bombup3(31) <= "11111111111111111111111111111111";


   --speedup code -- 000110
sprite_speedup0(0)  <= "00000000000000000000000000000000";
sprite_speedup0(1)  <= "00000000000000000000000000000000";
sprite_speedup0(2)  <= "00000000000001111111111111000000";
sprite_speedup0(3)  <= "00000000000011111111111111100000";
sprite_speedup0(4)  <= "00000000000110000000000000110000";
sprite_speedup0(5)  <= "00000000000110000000000000110000";
sprite_speedup0(6)  <= "00000000000111111100000000110000";
sprite_speedup0(7)  <= "00000000000111111110000000110000";
sprite_speedup0(8)  <= "00000000000110000000000000110000";
sprite_speedup0(9)  <= "00000000000110000000000000110000";
sprite_speedup0(10) <= "00000000000111111100000000110000";
sprite_speedup0(11) <= "00000000000111111110000000110000";
sprite_speedup0(12) <= "00000000000110000000000000110000";
sprite_speedup0(13) <= "00000011111110000000000000110000";
sprite_speedup0(14) <= "00000110000000000000000000110000";
sprite_speedup0(15) <= "00001100000000000000000000110000";
sprite_speedup0(16) <= "00011000000000000000000000011100";
sprite_speedup0(17) <= "00110000000000000000000000001100";
sprite_speedup0(18) <= "00110000000000000000000000001100";
sprite_speedup0(19) <= "00110000000000000000000000001100";
sprite_speedup0(20) <= "00110000000000000000000000001100";
sprite_speedup0(21) <= "00110000000000000000000000001100";
sprite_speedup0(22) <= "00110000111110000000011111001100";
sprite_speedup0(23) <= "00110001100011000000110001101100";
sprite_speedup0(24) <= "00110111000001110011100000111000";
sprite_speedup0(25) <= "00001100011100011110001110001100";
sprite_speedup0(26) <= "00001100011100011110001110001100";
sprite_speedup0(27) <= "00000111000001110011100000111000";
sprite_speedup0(28) <= "00000001100011000000110001100000";
sprite_speedup0(29) <= "00000000111110000000011111000000";
sprite_speedup0(30) <= "00000000000000000000000000000000";
sprite_speedup0(31) <= "00000000000000000000000000000000";
```

```
sprite_speedup1(0)    <= "11111111111111111111111111111111";
sprite_speedup1(1)    <= "11111111111111111111111111111111";
sprite_speedup1(2)    <= "11111111111110000000000000111100";
sprite_speedup1(3)    <= "11111111111100000000000000011100";
sprite_speedup1(4)    <= "11111111111000000000000000001100";
sprite_speedup1(5)    <= "11111111111000000000000000001100";
sprite_speedup1(6)    <= "11111111111000000000000000001100";
sprite_speedup1(7)    <= "11111111111000000000000000001100";
sprite_speedup1(8)    <= "11111111111000000000000000001100";
sprite_speedup1(9)    <= "11111111111000000000000000001100";
sprite_speedup1(10) <= "11111111111000000000000000001100";
sprite_speedup1(11) <= "11111111111000000000000000001100";
sprite_speedup1(12) <= "11111100000000000000000000001100";
sprite_speedup1(13) <= "11110000000000000000000000001100";
sprite_speedup1(14) <= "11110000000000000000000000001100";
sprite_speedup1(15) <= "11100000000000000000000000001100";
sprite_speedup1(16) <= "11100000000000000000000000001100";
sprite_speedup1(17) <= "11000000000000000000000000000100";
sprite_speedup1(18) <= "11000000000000000000000000000000";
sprite_speedup1(19) <= "11000000000000000000000000000000";
sprite_speedup1(20) <= "11000000000000000000000000000000";
sprite_speedup1(21) <= "11000000000000000000000000000000";
sprite_speedup1(22) <= "11000000000000000000000000000000";
sprite_speedup1(23) <= "11000000000000000000000000000000";
sprite_speedup1(24) <= "11000000000000000000000000000100";
sprite_speedup1(25) <= "11110000000000000000000000000000";
sprite_speedup1(26) <= "11110000000000000000000000000000";
sprite_speedup1(27) <= "11111000000000001100000000000100";
sprite_speedup1(28) <= "11111110000000111111000000011111";
sprite_speedup1(29) <= "11111111000001111111100000111111";
sprite_speedup1(30) <= "00000000000000000000000000000000";
sprite_speedup1(31) <= "00000000000000000000000000000000";


sprite_speedup2(0)    <= "00000000000000000000000000000000";
sprite_speedup2(1)    <= "00000000000000000000000000000000";
sprite_speedup2(2)    <= "00000000000000000000000000000000";
sprite_speedup2(3)    <= "00000000000000000000000000000000";
```

```
sprite_speedup2(4)    <= "00000000000001111111111111000000";
sprite_speedup2(5)    <= "00000000000001111111111111000000";
sprite_speedup2(6)    <= "00000000000000000011111111000000";
sprite_speedup2(7)    <= "00000000000000000001111111000000";
sprite_speedup2(8)    <= "00000000000001111111111111000000";
sprite_speedup2(9)    <= "00000000000001111111111111000000";
sprite_speedup2(10) <= "00000000000000000011111111000000";
sprite_speedup2(11) <= "00000000000000000001111111000000";
sprite_speedup2(12) <= "00000000000001111111111111000000";
sprite_speedup2(13) <= "00000000000001111111111111000000";
sprite_speedup2(14) <= "00000001111111111111111111000000";
sprite_speedup2(15) <= "00000011111111111111111111100000";
sprite_speedup2(16) <= "00000111111111111111111111100000";
sprite_speedup2(17) <= "00001111111111111111111111110000";
sprite_speedup2(18) <= "00001111111111111111111111110000";
sprite_speedup2(19) <= "00001111111111111111111111110000";
sprite_speedup2(20) <= "00001111111111111111111111110000";
sprite_speedup2(21) <= "00001111111111111111111111110000";
sprite_speedup2(22) <= "00001111000001111111100000110000";
sprite_speedup2(23) <= "00001110011100111111001110000000";
sprite_speedup2(24) <= "00001000111110000000011111000000";
sprite_speedup2(25) <= "00000011100011100001110001110000";
sprite_speedup2(26) <= "00000011100011100001110001110000";
sprite_speedup2(27) <= "00000000111110000000011111000000";
sprite_speedup2(28) <= "00000000011100000000001110000000";
sprite_speedup2(29) <= "00000000000000000000000000000000";
sprite_speedup2(30) <= "00000000000000000000000000000000";
sprite_speedup2(31) <= "00000000000000000000000000000000";


sprite_speedup3(0)    <= "11111111111111111111111111111111";
sprite_speedup3(1)    <= "11111111111111111111111111111111";
sprite_speedup3(2)    <= "11000000000000000000000000000011";
sprite_speedup3(3)    <= "11000000000000000000000000000011";
sprite_speedup3(4)    <= "11000000000000000000000000000011";
sprite_speedup3(5)    <= "11000000000000000000000000000011";
sprite_speedup3(6)    <= "11000000000000000000000000000011";
sprite_speedup3(7)    <= "11000000000000000000000000000011";
```

```
sprite_speedup3(8)    <= "11000000000000000000000000000011";
sprite_speedup3(9)    <= "11000000000000000000000000000011";
sprite_speedup3(10) <= "11000000000000000000000000000011";
sprite_speedup3(11) <= "11000000000000000000000000000011";
sprite_speedup3(12) <= "11000000000000000000000000000011";
sprite_speedup3(13) <= "11000000000000000000000000000011";
sprite_speedup3(14) <= "11000000000000000000000000000011";
sprite_speedup3(15) <= "11000000000000000000000000000011";
sprite_speedup3(16) <= "11000000000000000000000000000011";
sprite_speedup3(17) <= "11000000000000000000000000000011";
sprite_speedup3(18) <= "11000000000000000000000000000011";
sprite_speedup3(19) <= "11000000000000000000000000000011";
sprite_speedup3(20) <= "11000000000000000000000000000011";
sprite_speedup3(21) <= "11000000000000000000000000000011";
sprite_speedup3(22) <= "11000000000000000000000000000011";
sprite_speedup3(23) <= "11000000000000000000000000000011";
sprite_speedup3(24) <= "11000000000000000000000000000011";
sprite_speedup3(25) <= "11000000000000000000000000000011";
sprite_speedup3(26) <= "11000000000000000000000000000011";
sprite_speedup3(27) <= "11000000000000000000000000000011";
sprite_speedup3(28) <= "11000000000000000000000000000011";
sprite_speedup3(29) <= "11000000000000000000000000000011";
sprite_speedup3(30) <= "11111111111111111111111111111111";
sprite_speedup3(31) <= "11111111111111111111111111111111";


   HCounter : process (clk_counter)
   begin
      if rising_edge(clk_counter) then
         if reset = '1' then
            Hcount <= (others => '0');
         elsif EndOfLine = '1' then
            Hcount <= (others => '0');
         else
            Hcount <= Hcount + 1;
         end if;
      end if;
   end process HCounter;
```

```
EndOfLine <= '1' when Hcount = HTOTAL - 1 else '0';

VCounter: process (clk_counter)
begin
   if rising_edge(clk_counter) then
      if reset = '1' then
         Vcount <= (others => '0');
      elsif EndOfLine = '1' then
         if EndOfField = '1' then
            Vcount <= (others => '0');
         else
            Vcount <= Vcount + 1;
         end if;
      end if;
   end if;
end process VCounter;

EndOfField <= '1' when Vcount = VTOTAL - 1 else '0';

-- State machines to generate HSYNC, VSYNC, HBLANK, and VBLANK

HSyncGen : process (clk_counter)
begin
   if rising_edge(clk_counter) then
      if reset = '1' or EndOfLine = '1' then
         vga_hsync <= '1';
      elsif Hcount = HSYNC - 1 then
         vga_hsync <= '0';
      end if;
   end if;
end process HSyncGen;

HBlankGen : process (clk_counter)
begin
   if rising_edge(clk_counter) then
      if reset = '1' then
         vga_hblank <= '1';
```

```
        elsif Hcount = HSYNC + HBACK_PORCH then
            vga_hblank <= '0';
        elsif Hcount = HSYNC + HBACK_PORCH + HACTIVE then
            vga_hblank <= '1';
        end if;
    end if;
end process HBlankGen;

VSyncGen : process (clk_counter)
begin
    if rising_edge(clk_counter) then
        if reset = '1' then
            vga_vsync <= '1';
        elsif EndOfLine ='1' then
            if EndOfField = '1' then
                vga_vsync <= '1';
            elsif Vcount = VSYNC - 1 then
                vga_vsync <= '0';
            end if;
        end if;
    end if;
end process VSyncGen;

VBlankGen : process (clk_counter)
begin
    if rising_edge(clk_counter) then
        if reset = '1' then
            vga_vblank <= '1';
        elsif EndOfLine = '1' then
            if Vcount = VSYNC + VBACK_PORCH - 1 then
                vga_vblank <= '0';
            elsif Vcount = VSYNC + VBACK_PORCH + VACTIVE - 1 then
                vga_vblank <= '1';
            end if;
        end if;
    end if;
end process VBlankGen;
```

```
Timergen : process(clk)
variable counter : integer := 0;
begin
   if rising_edge(clk) then
     if(gamestage = "0001") then
       counter := counter + 1;
       if counter >= 500000 then
            counter := 0;
            timer <= timer + 1;
       end if;
     else
            timer <= (others => '0');
       --     player1_pos <= "10";
       --     player2_pos <= "10";
     end if;
   end if;
end process Timergen;

-- Registered video signals going to the video DAC
control: process (clk, reset)
variable tilex : unsigned(6 downto 0);
variable tiley : unsigned(4 downto 0);
variable code    : unsigned(5 downto 0);
variable player1_x_old : unsigned (9 downto 0);     -- the old x_pos of the player1
variable player1_y_old : unsigned (9 downto 0);     -- the old y_pos of the player1
variable player2_x_old : unsigned (9 downto 0);     -- the old x_pos of the player2
variable player2_y_old : unsigned (9 downto 0);     -- the old y_pos of the player2
variable player3_x_old : unsigned (9 downto 0);     -- the old x_pos of the player3
variable player3_y_old : unsigned (9 downto 0);     -- the old y_pos of the player3
variable player4_x_old : unsigned (9 downto 0);     -- the old x_pos of the player4
variable player4_y_old : unsigned (9 downto 0);     -- the old y_pos of the player4

begin
  if reset = '1' then

  elsif clk'event and clk = '1' then

    ----------address 0,1 11 for player1 x,y,states--------------------
```

```
----------address 2,3 12 for player2 x,y,states--------------------
----------address 4,5 13 for player3 x,y,states--------------------
----------address 6,7 14 for player4 x,y,states--------------------
----------address 9,10 for tile,time------------------------------

---------------------write player1 position-----------------------
if (chipselect = '1' and write = '1' and address = "00000000") then
  player1_x_old := player1_x(9 downto 0);
  player1_x <= writedata(9 downto 0);
       if (player1_x_old < writedata) then
          player1_pos <= "11";
       elsif (player1_x_old > writedata) then
          player1_pos <= "01";
       end if;
end if;
if (chipselect = '1' and write = '1' and address = "00000001") then
    player1_y_old := player1_y(9 downto 0);
    player1_y <= writedata(9 downto 0);
       if (player1_y_old < writedata) then
          player1_pos <= "10";
       elsif (player1_y_old > writedata) then
          player1_pos <= "00";
       end if;
end if;
---------------------write player2 position-----------------------
if (chipselect = '1' and write = '1' and address = "00000010") then
    player2_x_old := player2_x(9 downto 0);
    player2_x <= writedata(9 downto 0);
       if (player2_x_old < writedata) then
          player2_pos <= "11";
       elsif (player2_x_old > writedata) then
          player2_pos <= "01";

       end if;
end if;
if (chipselect = '1' and write = '1' and address = "00000011") then
    player2_y_old := player2_y(9 downto 0);
    player2_y <= writedata(9 downto 0);
```

```
        if (player2_y_old < writedata) then
            player2_pos <= "10";
        elsif (player2_y_old > writedata) then
            player2_pos <= "00";
        end if;
end if;
----------------------write player3 position-----------------------
if (chipselect = '1' and write = '1' and address = "00000100") then
    player3_x_old := player3_x(9 downto 0);
    player3_x <= writedata(9 downto 0);
        if (player3_x_old < writedata) then
            player3_pos <= "11";
        elsif (player3_x_old > writedata) then
            player3_pos <= "01";
        end if;
end if;
if (chipselect = '1' and write = '1' and address = "00000101") then
    player3_y_old := player3_y(9 downto 0);
    player3_y <= writedata(9 downto 0);
        if (player3_y_old < writedata) then
            player3_pos <= "10";
        elsif (player3_y_old > writedata) then
            player3_pos <= "00";
        end if;
end if;
----------------------write player4 position-----------------------
if (chipselect = '1' and write = '1' and address = "00000110") then
    player4_x_old := player4_x(9 downto 0);
    player4_x <= writedata(9 downto 0);
        if (player4_x_old < writedata) then
            player4_pos <= "11";
        elsif (player4_x_old > writedata) then
            player4_pos <= "01";
        end if;
end if;
if (chipselect = '1' and write = '1' and address = "00000111") then
    player4_y_old := player4_y(9 downto 0);
    player4_y <= writedata(9 downto 0);
```

```
            if (player4_y_old < writedata) then
               player4_pos <= "10";
            elsif (player4_y_old > writedata) then
               player4_pos <= "00";
            end if;
        end if;
        ----------------------set tiles' content--------------------------
        if (chipselect = '1' and write = '1' and address = "00001001") then
          tilex(4 downto 0) := writedata(4 downto 0);
          tiley                    := writedata(9 downto 5);--
          code(5 downto 0)    := writedata(15 downto 10);--
          control_array(14-to_integer(unsigned(tiley)),119-to_integer(unsigned(((tilex sll
2) + tilex + tilex)+5))) <= code(0);
          control_array(14-to_integer(unsigned(tiley)),119-to_integer(unsigned(((tilex sll
2) + tilex + tilex)+4))) <= code(1);
          control_array(14-to_integer(unsigned(tiley)),119-to_integer(unsigned(((tilex sll
2) + tilex + tilex)+3))) <= code(2);
          control_array(14-to_integer(unsigned(tiley)),119-to_integer(unsigned(((tilex sll
2) + tilex + tilex)+2))) <= code(3);
          control_array(14-to_integer(unsigned(tiley)),119-to_integer(unsigned(((tilex sll
2) + tilex + tilex)+1))) <= code(4);
          control_array(14-to_integer(unsigned(tiley)),119-to_integer(unsigned(((tilex sll
2) + tilex + tilex)+0))) <= code(5);
        end if;
        ----------------------set gamestage = 10      ------------------------
        if (chipselect = '1' and write = '1' and address = "00001010") then
                gamestage <= writedata(3 downto 0);
        end if;
        ----------------------set player1 states address = 11--------------
        if (chipselect = '1' and write = '1' and address = "00001011") then
                player1_s <= writedata(2 downto 0);
        end if;
        ----------------------set player2 states address = 12--------------
        if (chipselect = '1' and write = '1' and address = "00001100") then
                player2_s <= writedata(2 downto 0);
        end if;
        ----------------------set player3 states address = 13--------------
        if (chipselect = '1' and write = '1' and address = "00001101") then
```

```
            player3_s <= writedata(2 downto 0);
    end if;
    ----------------------set player4 states address = 14--------------
    if (chipselect = '1' and write = '1' and address = "00001110") then
            player4_s <= writedata(2 downto 0);
    end if;

    if (chipselect = '1' and write = '1' and address = "00001111") then
            pointer_y <= writedata(9 downto 0);
    end if;

    ----------------------read current    time----------------------------
    if (chipselect = '1' and write = '1' and address = "00000000") then
         readdata(15 downto 0) <= timer(15 downto 0);
    end if;


end if;
end process control;


VideoOut: process (clk_counter, reset)
variable control_array_row        : unsigned (119 downto 0);
variable sprite_background0_row : unsigned (31 downto 0);
variable sprite_background1_row : unsigned (31 downto 0);
variable sprite_concrete0_row : unsigned (31 downto 0);
variable sprite_concrete1_row : unsigned (31 downto 0);
variable sprite_concrete2_row : unsigned (31 downto 0);
variable sprite_bomber0_row      : unsigned (31 downto 0);
variable sprite_bomber1_row      : unsigned (31 downto 0);
variable sprite_bomber2_row      : unsigned (31 downto 0);
variable sprite_bomber3_row      : unsigned (31 downto 0);
variable sprite_fire0_row          : unsigned (31 downto 0);
variable sprite_fire1_row          : unsigned (31 downto 0);
variable sprite_fire2_row    : unsigned (31 downto 0);
variable sprite_brick0_row        : unsigned (31 downto 0);
variable sprite_brick1_row        : unsigned (31 downto 0);
variable sprite_brick2_row        : unsigned (31 downto 0);
```

```
    variable sprite_powerup0_row    : unsigned (31 downto 0);
    variable sprite_powerup1_row    : unsigned (31 downto 0);
    variable sprite_powerup2_row    : unsigned (31 downto 0);
    variable sprite_bombup0_row     : unsigned (31 downto 0);
    variable sprite_bombup1_row     : unsigned (31 downto 0);
    variable sprite_bombup2_row     : unsigned (31 downto 0);
    variable sprite_bombup3_row     : unsigned (31 downto 0);
    variable sprite_bombup4_row     : unsigned (31 downto 0);
    variable sprite_speedup0_row    : unsigned (31 downto 0);
    variable sprite_speedup1_row    : unsigned (31 downto 0);
    variable sprite_speedup2_row    : unsigned (31 downto 0);
    variable sprite_speedup3_row    : unsigned (31 downto 0);
    variable sprite_bomberman0_row: unsigned (31 downto 0);
    variable sprite_bomberman1_row: unsigned (31 downto 0);
    variable sprite_bomberman2_row: unsigned (31 downto 0);
    variable sprite_bomberman3_row: unsigned (31 downto 0);
    variable sprite_bomberman4_row: unsigned (31 downto 0);

    variable sprite_bomberman20_row : unsigned (31 downto 0);
    variable sprite_bomberman21_row : unsigned (31 downto 0);
    variable sprite_bomberman22_row : unsigned (31 downto 0);
    variable sprite_bomberman23_row : unsigned (31 downto 0);
    variable sprite_bomberman24_row : unsigned (31 downto 0);

    variable sprite_bomberman30_row : unsigned (31 downto 0);
    variable sprite_bomberman31_row : unsigned (31 downto 0);
    variable sprite_bomberman32_row : unsigned (31 downto 0);
    variable sprite_bomberman33_row : unsigned (31 downto 0);
    variable sprite_bomberman34_row : unsigned (31 downto 0);


    variable sprite_bomberman40_row : unsigned (31 downto 0);
    variable sprite_bomberman41_row : unsigned (31 downto 0);
    variable sprite_bomberman42_row : unsigned (31 downto 0);
    variable sprite_bomberman43_row : unsigned (31 downto 0);
    variable sprite_bomberman44_row : unsigned (31 downto 0);
--------------------title_row logo_row pointer_low----------------------------------------
    variable title_row        : unsigned (127 downto 0);
```

```
    variable pointer_row    : unsigned (15 downto 0);
    variable    sprite_bombermanlogo0_row : unsigned (199 downto 0);
    variable    sprite_bombermanlogo1_row : unsigned (199 downto 0);
    variable    sprite_bombermanlogo2_row : unsigned (199 downto 0);
    variable    sprite_bombermanlogo3_row : unsigned (199 downto 0);

-----------------------------------------------------------------
    variable control_array_V : unsigned (9 downto 0);
    variable control_array_H : unsigned (9 downto 0);
    variable player_array_V    : unsigned (9 downto 0);
    variable player_array_H    : unsigned (9 downto 0);
    variable sprite_array_V    : unsigned (9 downto 0);
    variable sprite_array_H    : unsigned (9 downto 0);

    variable sprite_player_V : unsigned (9 downto 0);
    variable sprite_player_H : unsigned (9 downto 0);

    variable sprite_player2_V: unsigned (9 downto 0);
    variable sprite_player2_H: unsigned (9 downto 0);

    variable sprite_player3_V: unsigned (9 downto 0);
    variable sprite_player3_H: unsigned (9 downto 0);

    variable sprite_player4_V: unsigned (9 downto 0);
    variable sprite_player4_H: unsigned (9 downto 0);

    variable ctrl_array_V: integer := to_integer(unsigned(14 - control_array_V));
    variable ctrl_array_H: integer := to_integer(unsigned(119 - ((control_array_H sll 2)
+ control_array_H + control_array_H)));

    variable temp_sprite_player_H    : unsigned (9 downto 0);
    variable temp_sprite_player2_H : unsigned (9 downto 0);
    variable temp_sprite_player3_H : unsigned (9 downto 0);
    variable temp_sprite_player4_H : unsigned (9 downto 0);
--------------------Sprite title V & H----------------------------
    variable sprite_title_V    : unsigned (9 downto 0);
    variable sprite_title_H    : unsigned (9 downto 0);
--------------------Sprite pointer V & H----------------------------
```

```
   variable sprite_pointer_V    : unsigned (9 downto 0);
   variable sprite_pointer_H    : unsigned (9 downto 0);
 ----------Sprite logo V & H----------
   variable sprite_bombermanlogo_V    : unsigned (9 downto 0);
   variable sprite_bombermanlogo_H    : unsigned (9 downto 0);

   variable titletempy : integer;
   variable titletempx : integer;
   variable logotempy : integer;
   variable logotempx : integer;
   variable logoarray : integer;
   variable player1tempx : integer;
   variable player1tempy : integer;
   variable player2tempx : integer;
   variable player2tempy : integer;
   variable player3tempx : integer;
   variable player3tempy : integer;
   variable player4tempx : integer;
   variable player4tempy : integer;
   begin

   if reset = '1' then
         VGA_R <= "0000000000";
         VGA_G <= "0000000000";
         VGA_B <= "0000000000";
   elsif clk_counter'event and clk_counter = '1' then    -- indicate rising edge
     control_array_V := (Vcount - (VSYNC + VBACK_PORCH)) srl 5;
     control_array_H := (Hcount - (HSYNC + HBACK_PORCH)) srl 5;

     player_array_V := (Vcount - (VSYNC + VBACK_PORCH));
     player_array_H := (Hcount - (HSYNC + HBACK_PORCH));
     sprite_array_V := (Vcount - (VSYNC + VBACK_PORCH)) AND "0000011111";
     sprite_array_H := (Hcount - (HSYNC + HBACK_PORCH)) AND "0000011111";
----------sprite title----------
     sprite_title_V    := (Vcount - (VSYNC + VBACK_PORCH) - title_y + 24) mod
48;-- doesn't work using AND "0000101111";
     sprite_title_H    := (Hcount - (HSYNC + HBACK_PORCH) - title_x + 64) AND
"0001111111";
```

```
-------------------sprite pointer-------------------------------------------------------
    sprite_pointer_V    := (Vcount - (VSYNC + VBACK_PORCH) - pointer_y + 8)
AND "0000001111";
    sprite_pointer_H    := (Hcount - (HSYNC + HBACK_PORCH) - pointer_x + 8)
AND "0000001111";
-------------------sprite logo----------------------------------------------------------
    sprite_bombermanlogo_V    := (Vcount - (VSYNC + VBACK_PORCH) - logo_y
+ 100) mod 200;
    sprite_bombermanlogo_H    := (Hcount - (HSYNC + HBACK_PORCH) - logo_x
+ 100) mod 200;
-------------------player---------------------------------------------------------------
    sprite_player_V    := (Vcount - (VSYNC + VBACK_PORCH) - player1_y+16)
AND "0000011111";
    sprite_player_H    := (Hcount - (HSYNC + HBACK_PORCH) - player1_x+16)
AND "0000011111";
    sprite_player2_V := (Vcount - (VSYNC + VBACK_PORCH) - player2_y+16)
AND "0000011111";
    sprite_player2_H := (Hcount - (HSYNC + HBACK_PORCH) - player2_x+16)
AND "0000011111";
    sprite_player3_V := (Vcount - (VSYNC + VBACK_PORCH) - player3_y+16)
AND "0000011111";
    sprite_player3_H := (Hcount - (HSYNC + HBACK_PORCH) - player3_x+16)
AND "0000011111";
    sprite_player4_V := (Vcount - (VSYNC + VBACK_PORCH) - player4_y+16)
AND "0000011111";
    sprite_player4_H := (Hcount - (HSYNC + HBACK_PORCH) - player4_x+16)
AND "0000011111";


---------------------------------------select pos for player1-------------------------------
   if(player1_pos = "10") then
      sprite_bomberman0_row :=
sprite_bomberman0(to_integer(unsigned(sprite_player_V)));
      sprite_bomberman1_row :=
sprite_bomberman1(to_integer(unsigned(sprite_player_V)));
      sprite_bomberman2_row :=
sprite_bomberman2(to_integer(unsigned(sprite_player_V)));
      sprite_bomberman3_row :=
sprite_bomberman3(to_integer(unsigned(sprite_player_V)));
```

```
        sprite_bomberman4_row :=
sprite_bomberman4(to_integer(unsigned(sprite_player_V)));
        temp_sprite_player_H := 31 - sprite_player_H;
      elsif(player1_pos = "00") then
        sprite_bomberman0_row :=
sprite_bombermanB0(to_integer(unsigned(sprite_player_V)));
        sprite_bomberman1_row :=
sprite_bombermanB1(to_integer(unsigned(sprite_player_V)));
        sprite_bomberman2_row :=
sprite_bombermanB2(to_integer(unsigned(sprite_player_V)));
        sprite_bomberman3_row :=
sprite_bombermanB3(to_integer(unsigned(sprite_player_V)));
        sprite_bomberman4_row :=
sprite_bombermanB4(to_integer(unsigned(sprite_player_V)));
        temp_sprite_player_H := 31 - sprite_player_H;
      elsif(player1_pos = "01") then
        sprite_bomberman0_row :=
sprite_bombermanL0(to_integer(unsigned(sprite_player_V)));
        sprite_bomberman1_row :=
sprite_bombermanL1(to_integer(unsigned(sprite_player_V)));
        sprite_bomberman2_row :=
sprite_bombermanL2(to_integer(unsigned(sprite_player_V)));
        sprite_bomberman3_row :=
sprite_bombermanL3(to_integer(unsigned(sprite_player_V)));
        sprite_bomberman4_row :=
sprite_bombermanL4(to_integer(unsigned(sprite_player_V)));
        temp_sprite_player_H := 31 - sprite_player_H;
        elsif(player1_pos = "11") then
        sprite_bomberman0_row :=
sprite_bombermanL0(to_integer(unsigned(sprite_player_V)));
        sprite_bomberman1_row :=
sprite_bombermanL1(to_integer(unsigned(sprite_player_V)));
        sprite_bomberman2_row :=
sprite_bombermanL2(to_integer(unsigned(sprite_player_V)));
        sprite_bomberman3_row :=
sprite_bombermanL3(to_integer(unsigned(sprite_player_V)));
        sprite_bomberman4_row :=
sprite_bombermanL4(to_integer(unsigned(sprite_player_V)));
```

```
        temp_sprite_player_H := sprite_player_H;
      end if;
-------------------------------------select pos for player2------------------------------
      if(player2_pos = "10") then
        sprite_bomberman20_row :=
sprite_bomberman0(to_integer(unsigned(sprite_player2_V)));
        sprite_bomberman21_row :=
sprite_bomberman1(to_integer(unsigned(sprite_player2_V)));
        sprite_bomberman22_row :=
sprite_bomberman2(to_integer(unsigned(sprite_player2_V)));
        sprite_bomberman23_row :=
sprite_bomberman3(to_integer(unsigned(sprite_player2_V)));
        sprite_bomberman24_row :=
sprite_bomberman4(to_integer(unsigned(sprite_player2_V)));
        temp_sprite_player2_H := 31 - sprite_player2_H;
      elsif(player2_pos = "00") then
        sprite_bomberman20_row :=
sprite_bombermanB0(to_integer(unsigned(sprite_player2_V)));
        sprite_bomberman21_row :=
sprite_bombermanB1(to_integer(unsigned(sprite_player2_V)));
        sprite_bomberman22_row :=
sprite_bombermanB2(to_integer(unsigned(sprite_player2_V)));
        sprite_bomberman23_row :=
sprite_bombermanB3(to_integer(unsigned(sprite_player2_V)));
        sprite_bomberman24_row :=
sprite_bombermanB4(to_integer(unsigned(sprite_player2_V)));
        temp_sprite_player2_H := 31 - sprite_player2_H;
      elsif(player2_pos = "01") then
        sprite_bomberman20_row :=
sprite_bombermanL0(to_integer(unsigned(sprite_player2_V)));
        sprite_bomberman21_row :=
sprite_bombermanL1(to_integer(unsigned(sprite_player2_V)));
        sprite_bomberman22_row :=
sprite_bombermanL2(to_integer(unsigned(sprite_player2_V)));
        sprite_bomberman23_row :=
sprite_bombermanL3(to_integer(unsigned(sprite_player2_V)));
        sprite_bomberman24_row :=
sprite_bombermanL4(to_integer(unsigned(sprite_player2_V)));
```

```
        temp_sprite_player2_H := 31 - sprite_player2_H;
        elsif(player2_pos = "11") then
        sprite_bomberman20_row :=
sprite_bombermanL0(to_integer(unsigned(sprite_player2_V)));
        sprite_bomberman21_row :=
sprite_bombermanL1(to_integer(unsigned(sprite_player2_V)));
        sprite_bomberman22_row :=
sprite_bombermanL2(to_integer(unsigned(sprite_player2_V)));
        sprite_bomberman23_row :=
sprite_bombermanL3(to_integer(unsigned(sprite_player2_V)));
        sprite_bomberman24_row :=
sprite_bombermanL4(to_integer(unsigned(sprite_player2_V)));
        temp_sprite_player2_H := sprite_player2_H;
      end if;
-------------------------------------select pos for player3-------------------------------
      if(player3_pos = "10") then
        sprite_bomberman30_row :=
sprite_bomberman0(to_integer(unsigned(sprite_player3_V)));
        sprite_bomberman31_row :=
sprite_bomberman1(to_integer(unsigned(sprite_player3_V)));
        sprite_bomberman32_row :=
sprite_bomberman2(to_integer(unsigned(sprite_player3_V)));
        sprite_bomberman33_row :=
sprite_bomberman3(to_integer(unsigned(sprite_player3_V)));
        sprite_bomberman34_row :=
sprite_bomberman4(to_integer(unsigned(sprite_player3_V)));
        temp_sprite_player3_H := 31 - sprite_player3_H;
      elsif(player3_pos = "00") then
        sprite_bomberman30_row :=
sprite_bombermanB0(to_integer(unsigned(sprite_player3_V)));
        sprite_bomberman31_row :=
sprite_bombermanB1(to_integer(unsigned(sprite_player3_V)));
        sprite_bomberman32_row :=
sprite_bombermanB2(to_integer(unsigned(sprite_player3_V)));
        sprite_bomberman33_row :=
sprite_bombermanB3(to_integer(unsigned(sprite_player3_V)));
        sprite_bomberman34_row :=
sprite_bombermanB4(to_integer(unsigned(sprite_player3_V)));
```

```
        temp_sprite_player3_H := 31 - sprite_player3_H;
      elsif(player3_pos = "01") then
        sprite_bomberman30_row :=
sprite_bombermanL0(to_integer(unsigned(sprite_player3_V)));
        sprite_bomberman31_row :=
sprite_bombermanL1(to_integer(unsigned(sprite_player3_V)));
        sprite_bomberman32_row :=
sprite_bombermanL2(to_integer(unsigned(sprite_player3_V)));
        sprite_bomberman33_row :=
sprite_bombermanL3(to_integer(unsigned(sprite_player3_V)));
        sprite_bomberman34_row :=
sprite_bombermanL4(to_integer(unsigned(sprite_player3_V)));
        temp_sprite_player3_H := 31 - sprite_player3_H;
        elsif(player3_pos = "11") then
        sprite_bomberman30_row :=
sprite_bombermanL0(to_integer(unsigned(sprite_player3_V)));
        sprite_bomberman31_row :=
sprite_bombermanL1(to_integer(unsigned(sprite_player3_V)));
        sprite_bomberman32_row :=
sprite_bombermanL2(to_integer(unsigned(sprite_player3_V)));
        sprite_bomberman33_row :=
sprite_bombermanL3(to_integer(unsigned(sprite_player3_V)));
        sprite_bomberman34_row :=
sprite_bombermanL4(to_integer(unsigned(sprite_player3_V)));
        temp_sprite_player3_H := sprite_player3_H;
      end if;
-----------------------------------select pos for player4-------------------------------
      if(player4_pos = "10") then
        sprite_bomberman40_row :=
sprite_bomberman0(to_integer(unsigned(sprite_player4_V)));
        sprite_bomberman41_row :=
sprite_bomberman1(to_integer(unsigned(sprite_player4_V)));
        sprite_bomberman42_row :=
sprite_bomberman2(to_integer(unsigned(sprite_player4_V)));
        sprite_bomberman43_row :=
sprite_bomberman3(to_integer(unsigned(sprite_player4_V)));
        sprite_bomberman44_row :=
sprite_bomberman4(to_integer(unsigned(sprite_player4_V)));
```

```
        temp_sprite_player4_H := 31 - sprite_player4_H;
      elsif(player4_pos = "00") then
        sprite_bomberman40_row :=
sprite_bombermanB0(to_integer(unsigned(sprite_player4_V)));
        sprite_bomberman41_row :=
sprite_bombermanB1(to_integer(unsigned(sprite_player4_V)));
        sprite_bomberman42_row :=
sprite_bombermanB2(to_integer(unsigned(sprite_player4_V)));
        sprite_bomberman43_row :=
sprite_bombermanB3(to_integer(unsigned(sprite_player4_V)));
        sprite_bomberman44_row :=
sprite_bombermanB4(to_integer(unsigned(sprite_player4_V)));
        temp_sprite_player4_H := 31 - sprite_player4_H;
      elsif(player4_pos = "01") then
        sprite_bomberman40_row :=
sprite_bombermanL0(to_integer(unsigned(sprite_player4_V)));
        sprite_bomberman41_row :=
sprite_bombermanL1(to_integer(unsigned(sprite_player4_V)));
        sprite_bomberman42_row :=
sprite_bombermanL2(to_integer(unsigned(sprite_player4_V)));
        sprite_bomberman43_row :=
sprite_bombermanL3(to_integer(unsigned(sprite_player4_V)));
        sprite_bomberman44_row :=
sprite_bombermanL4(to_integer(unsigned(sprite_player4_V)));
        temp_sprite_player4_H := 31 - sprite_player4_H;
        elsif(player4_pos = "11") then
        sprite_bomberman40_row :=
sprite_bombermanL0(to_integer(unsigned(sprite_player4_V)));
        sprite_bomberman41_row :=
sprite_bombermanL1(to_integer(unsigned(sprite_player4_V)));
        sprite_bomberman42_row :=
sprite_bombermanL2(to_integer(unsigned(sprite_player4_V)));
        sprite_bomberman43_row :=
sprite_bombermanL3(to_integer(unsigned(sprite_player4_V)));
        sprite_bomberman44_row :=
sprite_bombermanL4(to_integer(unsigned(sprite_player4_V)));
        temp_sprite_player4_H := sprite_player4_H;
      end if;
```

```
----------------------------------------title----------------------------------------------------
--------
title_row := title(to_integer(unsigned(47-sprite_title_V)));
pointer_row := pointer(to_integer(unsigned(15-sprite_pointer_V)));
titletempy := to_integer(player_array_V) - to_integer(title_y);
titletempx := to_integer(player_array_H) - to_integer(title_x);
logotempy := to_integer(player_array_V) - to_integer(logo_y);
logotempx := to_integer(player_array_H) - to_integer(logo_x);
logoarray := 199-to_integer(unsigned(sprite_bombermanlogo_H));
player1tempx := (to_integer(player_array_H) - to_integer(player1_x));
player1tempy := (to_integer(player_array_V) - to_integer(player1_y));
player2tempx := (to_integer(player_array_H) - to_integer(player2_x));
player2tempy := (to_integer(player_array_V) - to_integer(player2_y));
player3tempx := (to_integer(player_array_H) - to_integer(player3_x));
player3tempy := (to_integer(player_array_V) - to_integer(player3_y));
player4tempx := (to_integer(player_array_H) - to_integer(player4_x));
player4tempy := (to_integer(player_array_V) - to_integer(player4_y));
sprite_bombermanlogo0_row :=
sprite_bombermanlogo0(to_integer(unsigned(sprite_bombermanlogo_V)));
sprite_bombermanlogo1_row :=
sprite_bombermanlogo1(to_integer(unsigned(sprite_bombermanlogo_V)));
sprite_bombermanlogo2_row :=
sprite_bombermanlogo2(to_integer(unsigned(sprite_bombermanlogo_V)));
sprite_bombermanlogo3_row :=
sprite_bombermanlogo3(to_integer(unsigned(sprite_bombermanlogo_V)));
----------------------------------player
selecting-------------------------------------------------------------
if (titletempy < 24 and titletempy > -24 and titletempx    < 64 and titletempx    > -64
and title_row(127-to_integer(unsigned(sprite_title_H))) = '1' and gamestage = "0000"
and sprite_title_H < 128) then
      VGA_R <= "1111111111";
      VGA_G <= "1111111111";
      VGA_B <= "1111111111";
----------------------------------pointer---------------------------------------------------------
---------
elsif ((to_integer(player_array_V) - to_integer(pointer_y))< 8 and
(to_integer(player_array_V) - to_integer(pointer_y)) > -8 and
```

```
(to_integer(player_array_H) - to_integer(pointer_x)) < 8 and
(to_integer(player_array_H) - to_integer(pointer_x)) > -8 and
pointer_row(15-to_integer(unsigned(sprite_pointer_H))) = '1' and gamestage =
"0000") then
        VGA_R <= "1111111111";
        VGA_G <= "1111111111";
        VGA_B <= "1111111111";
-----------------------------------logo-----------------------------------------------------------
----------
elsif (logotempy < 100 and logotempy    > -100 and logotempx < 100 and logotempx
> -100 and sprite_bombermanlogo0_row(logoarray) = '1' and gamestage = "0000")
then
        VGA_R <= "0000000000";
        VGA_G <= "0000000000";
        VGA_B <= "0000000000";
elsif (logotempy < 100 and logotempy    > -100 and logotempx < 100 and logotempx
> -100 and sprite_bombermanlogo1_row(logoarray) = '1' and gamestage = "0000")
then
        VGA_R <= "1110000000";
        VGA_G <= "0000000000";
        VGA_B <= "0000000000";
elsif (logotempy < 100 and logotempy    > -100 and logotempx < 100 and logotempx
> -100 and sprite_bombermanlogo2_row(logoarray) = '1' and gamestage = "0000")
then
        VGA_R <= "1111111111";
        VGA_G <= "1111111111";
        VGA_B <= "0000000000";
elsif (logotempy < 100 and logotempy    > -100 and logotempx < 100 and logotempx
> -100 and sprite_bombermanlogo3_row(logoarray) = '1' and gamestage = "0000")
then
        VGA_R <= "1111111111";
        VGA_G <= "1111111111";
        VGA_B <= "1111111111";

---------------------------------player1---------------------------------------------------------
-----------------------------------------------------------------------------------------------
-----------------------------------
elsif (player1tempy < 16 and player1tempy    > -16 and player1tempx < 16 and
```

```
player1tempx    > -16 and
sprite_bomberman0_row(to_integer(temp_sprite_player_H)) = '1' and player1_s =
"000" and gamestage = playing) then
VGA_R <= "0000000000";
VGA_G <= "0000000000";
VGA_B <= "0000000000";
elsif (player1tempy < 16 and player1tempy > -16 and player1tempx < 16 and
player1tempx > -16 and sprite_bomberman1_row(to_integer(temp_sprite_player_H))
= '1' and player1_s = "000" and gamestage = playing) then
VGA_R <= "1111111111";
VGA_G <= "0100010100";
VGA_B <= "0100010110";

elsif (player1tempy < 16 and player1tempy > -16 and player1tempx < 16 and
player1tempx > -16 and sprite_bomberman2_row(to_integer(temp_sprite_player_H))
= '1' and player1_s = "000" and gamestage = playing) then
VGA_R <= "1111111111";
VGA_G <= "1101111000";
VGA_B <= "1010110100";

elsif (player1tempy < 16 and player1tempy > -16 and player1tempx < 16 and
player1tempx > -16 and sprite_bomberman3_row(to_integer(temp_sprite_player_H))
= '1' and player1_s = "000" and gamestage = playing) then
VGA_R <= "1111111111";
VGA_G <= "1111111111";
VGA_B <= "1111111111";

elsif (player1tempy < 16 and player1tempy > -16 and player1tempx < 16 and
player1tempx > -16 and sprite_bomberman4_row(to_integer(temp_sprite_player_H))
= '1' and player1_s = "000" and gamestage = playing) then
VGA_R <= "0000000000";
VGA_G <= "0000000000";
VGA_B <= "1111000000";
--------------------------------player2--------------------------------------------------------------
----------------------------------------------------------------------------------------------------
--------------------------------------
elsif (player2tempy    < 16 and player2tempy > -16 and player2tempx < 16 and
player2tempx > -16 and
```

```
sprite_bomberman20_row(to_integer(temp_sprite_player2_H)) = '1' and player2_s =
"000" and gamestage = playing) then
VGA_R <= "0000000000";
VGA_G <= "0000000000";
VGA_B <= "0000000000";
elsif (player2tempy < 16 and player2tempy > -16 and player2tempx < 16 and
player2tempx > -16 and
sprite_bomberman21_row(to_integer(temp_sprite_player2_H)) = '1' and player2_s =
"000" and gamestage = playing) then
VGA_R <= "1111111111";
VGA_G <= "0100010100";
VGA_B <= "0100010110";

elsif (player2tempy < 16 and player2tempy > -16 and player2tempx < 16 and
player2tempx > -16 and
sprite_bomberman22_row(to_integer(temp_sprite_player2_H)) = '1' and player2_s =
"000" and gamestage = playing) then
VGA_R <= "1111111111";
VGA_G <= "1101111000";
VGA_B <= "1010110100";

elsif (player2tempy < 16 and player2tempy > -16 and player2tempx < 16 and
player2tempx > -16 and
sprite_bomberman23_row(to_integer(temp_sprite_player2_H)) = '1' and player2_s =
"000" and gamestage = playing) then
VGA_R <= "0100000000";
VGA_G <= "0100000000";
VGA_B <= "0100000000";

elsif (player2tempy < 16 and player2tempy > -16 and player2tempx < 16 and
player2tempx > -16 and
sprite_bomberman24_row(to_integer(temp_sprite_player2_H)) = '1' and player2_s =
"000" and gamestage = playing) then
VGA_R <= "0000000000";
VGA_G <= "0000000000";
VGA_B <= "1111000000";
--------------------------------player3-----------------------------------------------------
-----------------------------------------------------------------------------------------------
```

```
---------------------------------------
elsif (player3tempy < 16 and player3tempy > -16 and player3tempx < 16 and
player3tempx > -16 and
sprite_bomberman30_row(to_integer(temp_sprite_player3_H)) = '1' and player3_s =
"000" and gamestage = playing) then
VGA_R <= "0000000000";
VGA_G <= "0000000000";
VGA_B <= "0000000000";
elsif (player3tempy < 16 and player3tempy > -16 and player3tempx < 16 and
player3tempx > -16 and
sprite_bomberman31_row(to_integer(temp_sprite_player3_H)) = '1' and player3_s =
"000" and gamestage = playing) then
VGA_R <= "1111111111";
VGA_G <= "0100010100";
VGA_B <= "0100010110";

elsif (player3tempy < 16 and player3tempy > -16 and player3tempx < 16 and
player3tempx > -16 and
sprite_bomberman32_row(to_integer(temp_sprite_player3_H)) = '1' and player3_s =
"000" and gamestage = playing) then
VGA_R <= "1111111111";
VGA_G <= "1101111000";
VGA_B <= "1010110100";

elsif (player3tempy < 16 and player3tempy > -16 and player3tempx < 16 and
player3tempx > -16 and
sprite_bomberman33_row(to_integer(temp_sprite_player3_H)) = '1' and player3_s =
"000" and gamestage = playing) then
VGA_R <= "0000000000";
VGA_G <= "1111111111";
VGA_B <= "0000000000";

elsif (player3tempy < 16 and player3tempy > -16 and player3tempx < 16 and
player3tempx > -16 and
sprite_bomberman34_row(to_integer(temp_sprite_player3_H)) = '1' and player3_s =
"000" and gamestage = playing) then
VGA_R <= "0000000000";
VGA_G <= "0000000000";
```

```
VGA_B <= "1111000000";
---------------------------------player4--------------------------------------------------------------
---------------------------------------------------------------------------------------------------------
---------------------------------------
elsif (player4tempy < 16 and player4tempy > -16 and player4tempx < 16 and
player4tempx > -16 and
sprite_bomberman40_row(to_integer(temp_sprite_player4_H)) = '1' and player4_s =
"000" and gamestage = playing) then
VGA_R <= "0000000000";
VGA_G <= "0000000000";
VGA_B <= "0000000000";
elsif (player4tempy < 16 and player4tempy > -16 and player4tempx < 16 and
player4tempx > -16 and
sprite_bomberman41_row(to_integer(temp_sprite_player4_H)) = '1' and player4_s =
"000" and gamestage = playing) then
VGA_R <= "1111111111";
VGA_G <= "0100010100";
VGA_B <= "0100010110";

elsif (player4tempy < 16 and player4tempy > -16 and player4tempx < 16 and
player4tempx > -16 and
sprite_bomberman42_row(to_integer(temp_sprite_player4_H)) = '1' and player4_s =
"000" and gamestage = playing) then
VGA_R <= "1111111111";
VGA_G <= "1101111000";
VGA_B <= "1010110100";

elsif (player4tempy < 16 and player4tempy > -16 and player4tempx < 16 and
player4tempx > -16 and
sprite_bomberman43_row(to_integer(temp_sprite_player4_H)) = '1' and player4_s =
"000" and gamestage = playing) then
VGA_R <= "0000000000";
VGA_G <= "1111111111";
VGA_B <= "1111111111";

elsif (player4tempy < 16 and player4tempy > -16 and player4tempx < 16 and
player4tempx > -16 and
sprite_bomberman44_row(to_integer(temp_sprite_player4_H)) = '1' and player4_s =
```

```
"000" and gamestage = playing) then
VGA_R <= "0000000000";
VGA_G <= "0000000000";
VGA_B <= "1111000000";
----------------------------------concrete-----------------------------------------------------
----------
elsif (control_array(ctrl_array_V,ctrl_array_H - 0) = '1' and
control_array(ctrl_array_V,ctrl_array_H - 1) = '1' and
control_array(ctrl_array_V,ctrl_array_H    - 2) = '1' and
control_array(ctrl_array_V,ctrl_array_H    - 3) = '1' and
control_array(ctrl_array_V,ctrl_array_H    - 4) = '1' and
control_array(ctrl_array_V,ctrl_array_H    - 5) = '1' and control_array_V <= 14 and
control_array_H    <= 19 and gamestage = playing) then
       sprite_concrete0_row := sprite_concrete0(to_integer(sprite_array_V));
       sprite_concrete1_row := sprite_concrete1(to_integer(sprite_array_V));
       sprite_concrete2_row := sprite_concrete2(to_integer(sprite_array_V));
        if (sprite_concrete1_row(to_integer(unsigned(31 - sprite_array_H))) = '1') then
        VGA_R <= "1011111000";
        VGA_G <= "1011111000";
        VGA_B <= "1011111000";
        end if;
        if (sprite_concrete0_row(to_integer(unsigned(31 - sprite_array_H))) = '1') then
        VGA_R <= "0110100100";
        VGA_G <= "0110100100";
        VGA_B <= "0110100100";
        end if;
        if (sprite_concrete2_row(to_integer(unsigned(31 - sprite_array_H))) = '1') then
        VGA_R <= "0000000000";
        VGA_G <= "0000000000";
        VGA_B <= "0000000000";
       end if;
-----------------------------bomber-------------------------------------------------
elsif (control_array(ctrl_array_V,ctrl_array_H - 0) = '0' and
control_array(ctrl_array_V,ctrl_array_H - 1) = '0' and
control_array(ctrl_array_V,ctrl_array_H    - 2) = '0' and
control_array(ctrl_array_V,ctrl_array_H    - 3) = '0' and
control_array(ctrl_array_V,ctrl_array_H    - 4) = '0' and
control_array(ctrl_array_V,ctrl_array_H    - 5) = '1' and control_array_V <= 14 and
```

```
control_array_H <= 19 and gamestage = playing) then
      sprite_bomber0_row := sprite_bomber0(to_integer(sprite_array_V));
      sprite_bomber1_row := sprite_bomber1(to_integer(sprite_array_V));
      sprite_bomber2_row := sprite_bomber2(to_integer(sprite_array_V));
      sprite_bomber3_row := sprite_bomber3(to_integer(sprite_array_V));
      if (sprite_bomber1_row(to_integer(unsigned(31 - sprite_array_H))) = '1') then
        VGA_R <= "1011100000";
        VGA_G <= "1000011000";
        VGA_B <= "0000101100";
      end if;
      if (sprite_bomber0_row(to_integer(unsigned(31 - sprite_array_H))) = '1') then
        VGA_R <= "0000000000";
        VGA_G <= "0000000000";
        VGA_B <= "0000000000";
      end if;
      if (sprite_bomber2_row(to_integer(unsigned(31 - sprite_array_H))) = '1') then
        VGA_R <= "1101001100";
        VGA_G <= "1101001100";
        VGA_B <= "1101001100";
      end if;
      if (sprite_bomber3_row(to_integer(unsigned(31 - sprite_array_H))) = '1') then
        VGA_R <= "1111111111";
        VGA_G <= "0000000000";
        VGA_B <= "0000000000";
      end if;
----------------------------fire-------------------------------------------------------
elsif (control_array(ctrl_array_V,ctrl_array_H - 0) = '0' and
control_array(ctrl_array_V,ctrl_array_H - 1) = '0' and
control_array(ctrl_array_V,ctrl_array_H    - 2) = '0' and
control_array(ctrl_array_V,ctrl_array_H    - 3) = '0' and
control_array(ctrl_array_V,ctrl_array_H    - 4) = '1' and
control_array(ctrl_array_V,ctrl_array_H    - 5) = '0' and control_array_V <= 14 and
control_array_H <= 19 and gamestage = playing) then
      sprite_fire0_row := sprite_fire0(to_integer(unsigned(sprite_array_V)));
      sprite_fire1_row := sprite_fire1(to_integer(unsigned(sprite_array_V)));
      sprite_fire2_row := sprite_concrete1(to_integer(unsigned(sprite_array_V)));
      if (sprite_fire2_row(to_integer(unsigned(31 - sprite_array_H))) = '1') then
        VGA_R <= "1111111111";
```

```
        VGA_G <= "1111111111";
        VGA_B <= "0011111111";
      end if;
      if (sprite_fire0_row(to_integer(unsigned(31 - sprite_array_H))) = '1') then
        VGA_R <= "1000000000";
        VGA_G <= "0000000000";
        VGA_B <= "0000000000";
      end if;
      if (sprite_fire1_row(to_integer(unsigned(31 - sprite_array_H))) = '1') then
        VGA_R <= "1111111111";
        VGA_G <= "0010000000";
        VGA_B <= "0000000000";
      end if;

-------------------------brick-----------------------------------------------------------
elsif (control_array(ctrl_array_V,ctrl_array_H - 0) = '0' and
control_array(ctrl_array_V,ctrl_array_H - 1) = '0' and
control_array(ctrl_array_V,ctrl_array_H  - 2) = '0' and
control_array(ctrl_array_V,ctrl_array_H  - 3) = '0' and
control_array(ctrl_array_V,ctrl_array_H  - 4) = '1' and
control_array(ctrl_array_V,ctrl_array_H  - 5) = '1' and control_array_V <= 14 and
control_array_H <= 19 and gamestage = playing) then
      sprite_brick0_row := sprite_brick0(to_integer(unsigned(sprite_array_V)));
      sprite_brick1_row := sprite_concrete1(to_integer(unsigned(sprite_array_V)));
      sprite_brick2_row := sprite_brick2(to_integer(unsigned(sprite_array_V)));
      if (sprite_brick1_row(to_integer(unsigned(31 - sprite_array_H))) = '1') then
        VGA_R <= "1111111111";
        VGA_G <= "1100000100";
        VGA_B <= "0010010100";
      end if;
      if (sprite_brick0_row(to_integer(unsigned(31 - sprite_array_H))) = '1') then
        VGA_R <= "1000101100";
        VGA_G <= "0110100100";
        VGA_B <= "0001010000";
      end if;
      if (sprite_brick2_row(to_integer(unsigned(31 - sprite_array_H))) = '1') then
        VGA_R <= "0000000000";
        VGA_G <= "0000000000";
```

```
        VGA_B <= "0000000000";
        end if;
-----------------------powerup-----------------------------------------------------
elsif (control_array(ctrl_array_V,ctrl_array_H - 0) = '0' and
control_array(ctrl_array_V,ctrl_array_H - 1) = '0' and
control_array(ctrl_array_V,ctrl_array_H    - 2) = '0' and
control_array(ctrl_array_V,ctrl_array_H    - 3) = '1' and
control_array(ctrl_array_V,ctrl_array_H    - 4) = '0' and
control_array(ctrl_array_V,ctrl_array_H    - 5) = '0' and control_array_V <= 14 and
control_array_H <= 19 and gamestage = playing) then
      sprite_powerup0_row :=
sprite_powerup0(to_integer(unsigned(sprite_array_V)));
      sprite_powerup1_row :=
sprite_powerup1(to_integer(unsigned(sprite_array_V)));
      sprite_powerup2_row :=
sprite_powerup2(to_integer(unsigned(sprite_array_V)));
      if (sprite_powerup0_row(to_integer(unsigned(31 - sprite_array_H))) = '1') then
        VGA_R <= "0000000000";
        VGA_G <= "0000000000";
        VGA_B <= "0000000000";
      elsif (sprite_powerup1_row(to_integer(unsigned(31 - sprite_array_H))) = '1')
then
        VGA_R <= "1111111111";
        VGA_G <= "1111111111";
        VGA_B <= "0000000000";
      else
        VGA_R <= "1111111111";
        VGA_G <= "0000000000";
        VGA_B <= "0000000000";
      end if;
----------------------bombup-------------------------------------------------------
elsif (control_array(ctrl_array_V,ctrl_array_H - 0) = '0' and
control_array(ctrl_array_V,ctrl_array_H - 1) = '0' and
control_array(ctrl_array_V,ctrl_array_H    - 2) = '0' and
control_array(ctrl_array_V,ctrl_array_H    - 3) = '1' and
control_array(ctrl_array_V,ctrl_array_H    - 4) = '0' and
control_array(ctrl_array_V,ctrl_array_H    - 5) = '1' and control_array_V <= 14 and
control_array_H <= 19 and gamestage = playing) then
```

```
        sprite_bombup0_row := sprite_bombup0(to_integer(unsigned(sprite_array_V)));
        sprite_bombup1_row := sprite_bombup1(to_integer(unsigned(sprite_array_V)));
        sprite_bombup2_row := sprite_bombup2(to_integer(unsigned(sprite_array_V)));
        sprite_bombup3_row := sprite_bombup3(to_integer(unsigned(sprite_array_V)));
        if (sprite_bombup0_row(to_integer(unsigned(31 - sprite_array_H))) = '1') then
          VGA_R <= "0000000000";
          VGA_G <= "0000000000";
          VGA_B <= "0000000000";
          end if;
          if (sprite_bombup1_row(to_integer(unsigned(31 - sprite_array_H))) = '1') then
          VGA_R <= "0110011000";
          VGA_G <= "1100110100";
          VGA_B <= "0000000000";
          end if;
          if (sprite_bombup2_row(to_integer(unsigned(31 - sprite_array_H))) = '1') then
          VGA_R <= "1101001100";
          VGA_G <= "1101001100";
          VGA_B <= "1101001100";
          end if;
          if (sprite_bombup3_row(to_integer(unsigned(31 - sprite_array_H))) = '1') then
          VGA_R <= "1111111111";
          VGA_G <= "0000000000";
          VGA_B <= "0000000000";
          end if;
--------------------speedup---------------------------------------------------------------
elsif (control_array(ctrl_array_V,ctrl_array_H - 0) = '0' and
control_array(ctrl_array_V,ctrl_array_H - 1) = '0' and
control_array(ctrl_array_V,ctrl_array_H    - 2) = '0' and
control_array(ctrl_array_V,ctrl_array_H    - 3) = '1' and
control_array(ctrl_array_V,ctrl_array_H    - 4) = '1' and
control_array(ctrl_array_V,ctrl_array_H    - 5) = '0' and control_array_V <= 14 and
control_array_H <= 19 and gamestage = playing) then
        sprite_speedup0_row := sprite_speedup0(to_integer(unsigned(sprite_array_V)));
        sprite_speedup1_row := sprite_speedup1(to_integer(unsigned(sprite_array_V)));
        sprite_speedup2_row := sprite_speedup2(to_integer(unsigned(sprite_array_V)));
        sprite_speedup3_row := sprite_speedup3(to_integer(unsigned(sprite_array_V)));
        if (sprite_speedup1_row(to_integer(unsigned(31 - sprite_array_H))) = '1') then
          VGA_R <= "0110011000";
```

```
        VGA_G <= "1100110100";
        VGA_B <= "0000000000";
        end if;
        if (sprite_speedup2_row(to_integer(unsigned(31 - sprite_array_H))) = '1') then
        VGA_R <= "1111111111";
        VGA_G <= "1111111111";
        VGA_B <= "1111111111";
        end if;
        if (sprite_speedup3_row(to_integer(unsigned(31 - sprite_array_H))) = '1') then
        VGA_R <= "1111111111";
        VGA_G <= "0000000000";
        VGA_B <= "0000000000";
        end if;
        if (sprite_speedup0_row(to_integer(unsigned(31 - sprite_array_H))) = '1') then
        VGA_R <= "0000000000";
        VGA_G <= "0000000000";
        VGA_B <= "0000000000";
        end if;
----------------------------background------------------------------------------------------
elsif (control_array(ctrl_array_V,ctrl_array_H - 0) = '0' and
control_array(ctrl_array_V,ctrl_array_H - 1) = '0' and
control_array(ctrl_array_V,ctrl_array_H    - 2) = '0' and
control_array(ctrl_array_V,ctrl_array_H    - 3) = '0' and
control_array(ctrl_array_V,ctrl_array_H    - 4) = '0' and
control_array(ctrl_array_V,ctrl_array_H    - 5) = '0' and control_array_V <= 14 and
control_array_H < 19 and gamestage = playing) then
      sprite_background0_row :=
sprite_concrete1(to_integer(unsigned(sprite_array_V)));
      sprite_background1_row :=
sprite_background1(to_integer(unsigned(sprite_array_V)));
       if (sprite_background0_row(to_integer(unsigned(31 - sprite_array_H))) =    '1')
then
        VGA_R <= "1011100000";
        VGA_G <= "1000011000";
        VGA_B <= "0000101100";
        end if;
        if (sprite_background1_row(to_integer(unsigned(31 - sprite_array_H))) =    '1')
then
```

```
        VGA_R <= "0000000000";
        VGA_G <= "0000000000";
        VGA_B <= "0000000000";
        end if;

-------------------------edge-----------------------
elsif vga_hblank = '0' and vga_vblank ='0' then
        VGA_R <= "0000000000";
        VGA_G <= "0000000000";
        VGA_B <= "0000000000";
else
        VGA_R <= "0000000000";
        VGA_G <= "0000000000";
        VGA_B <= "0000000000";
end if;

end if;

end process VideoOut;

   VGACLK_GEN: process(clk)
begin
   if rising_edge(clk) then
clk_counter <= not(clk_counter);
   end if;
end process VGACLK_GEN;

   VGA_HS <= not vga_hsync;
   VGA_VS <= not vga_vsync;
   VGA_SYNC <= '0';
   VGA_BLANK <= not (vga_hsync or vga_vsync);
   VGA_CLK <= clk_counter;
end rtl;
```

```
--------------------Audio Controller-----------------------------------------------------------------
library ieee;
use ieee.std_logic_1164.all;
use ieee.numeric_std.all;

entity de2_wm8731_audio is
port (
      clk : in std_logic;              --    Audio CODEC Chip Clock AUD_XCK (18.43
MHz)
      reset_n : in std_logic;
      test_mode : in std_logic;              --       Audio CODEC controller test mode
      audio_request : out std_logic;    --       Audio controller request new data
      data : in unsigned(15 downto 0);
      write : in std_logic;
      chipselect : in std_logic;
      writedata : in unsigned(15 downto 0);

      -- Audio interface signals
      AUD_ADCLRCK    : out    std_logic;      --       Audio CODEC ADC LR Clock
      AUD_ADCDAT     : in     std_logic;      --       Audio CODEC ADC Data
      AUD_DACLRCK    : out    std_logic;      --       Audio CODEC DAC LR Clock
      AUD_DACDAT     : out    std_logic;      --       Audio CODEC DAC Data
      AUD_BCLK       : inout std_logic    --       Audio CODEC Bit-Stream Clock
   );
end    de2_wm8731_audio;

architecture rtl of de2_wm8731_audio is

      type rom_type is array(639 downto 0) of unsigned(15 downto 0);
      constant ROM1 : rom_type :=
      (
   "1111111011111111",
  "1111111011111111",
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  "1111111011111111"
      );
      type rom_type2 is array(47 downto 0) of unsigned(15 downto 0);
      constant ROM2 : rom_type2 :=
(
      X"0000",
      X"10b4",
      X"2120",
      X"30fb",
      X"3fff",
      X"4deb",
      X"5a81",
      X"658b",
      X"6ed9",
```

X"7640",
X"7ba2",
X"7ee6",
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X"c001",
X"b215",
X"a57e",
X"9a74",
X"9127",
X"89bf",
X"845d",
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X"89bf",
X"9127",
X"9a74",
X"a57e",
X"b215",
X"c000",
X"cf05",
X"dee0",

```
        X"ef4b"
);

        signal key : unsigned(19 downto 0):=x"00001";
        signal reset : std_logic;
        signal music : std_logic:='0';
--        signal cnt : unsigned(14 downto 0):="000000000000000";
        signal cnt : unsigned(13 downto 0):="00000000000000";

        signal lrck : std_logic;
        signal bclk : std_logic;
        signal xck    : std_logic;

        signal lrck_divider : unsigned(19 downto 0);
        signal bclk_divider : unsigned(15 downto 0);

        signal set_bclk : std_logic;
        signal set_lrck : std_logic;
        signal clr_bclk : std_logic;
        signal lrck_lat : std_logic;

        signal shift_out : unsigned(15 downto 0);

        signal sin_out          : unsigned(15 downto 0);
        signal sin_counter : unsigned(9 downto 0):="0000000000";

begin

        -- LRCK divider
        -- Audio chip main clock is 18.432MHz / Sample rate 48KHz
        -- Divider is 18.432 MHz / 48KHz = 192 (X"C0")
        -- Left justify mode set by I2C controller

--variable stop : std_logic := '1';

    process(clk)
  begin
         if rising_edge(clk) then
```

```
            if chipselect = '1' then
                if write = '1' then

                    key <= writedata & "0000";

--                  if key = x"003e0" or key = x"00380" or key = x"00310" or key =
x"002e0" or key = x"00290" or key = x"00250" or key = x"00210" then
--                      music <= '1';
--                  else
--                      music <= '0';
--                  end if;

                else
                    key <= x"00001";
                end if;

            end if;
        end if;
    end process;

    process (clk)
    begin
        if rising_edge(clk) then
            if reset_n = '0' then
                lrck_divider <= (others => '0');
            elsif lrck_divider = key-1    then            -- "C0" minus 1
        --    elsif lrck_divider = 191    then
                lrck_divider <= X"00000";
            else
                lrck_divider <= lrck_divider + 1;
            end if;
        end if;
    end process;

    process (clk)
    begin
        if rising_edge(clk) then
            if reset_n = '0' then
```

```
            bclk_divider <= (others => '0');
        elsif bclk_divider = key(19 downto 4)-1 or set_lrck = '1'    then
--        elsif bclk_divider = 11 or set_lrck = '1'    then
            bclk_divider <= X"0000";
        else
            bclk_divider <= bclk_divider + 1;
        end if;
      end if;
    end process;

    set_lrck <= '1' when lrck_divider = key-1 else '0';
    --set_lrck <= '1' when lrck_divider = 191 else '0';
--    stop <= '0' when key = x"00300" else '1';

    process (clk)
    begin
      if rising_edge(clk) then
        if reset_n = '0' then
          lrck <= '0';
        elsif set_lrck = '1' then
          lrck <= not lrck;
        end if;
      end if;
    end process;

    -- BCLK divider
    set_bclk <= '1' when bclk_divider(11 downto 0) = ('0' & key(19 downto 5))-1 else
'0';
    clr_bclk <= '1' when bclk_divider(11 downto 0) = key(19 downto 4)-1 else '0';

--    set_bclk <= '1' when bclk_divider(11 downto 0) = 5 else '0';
--    clr_bclk <= '1' when bclk_divider(11 downto 0) = 11 else '0';

    process (clk)
    begin
      if rising_edge(clk) then
        if reset_n = '0' then
          bclk <= '0';
```

```
        elsif set_lrck = '1' or clr_bclk = '1' then
            bclk <= '0';
        elsif set_bclk = '1' then
            bclk <= '1';
        end if;
    end if;
end process;

-- Audio data shift output
process (clk)
begin
    if rising_edge(clk) then
        if reset_n = '0' then
            shift_out <= (others => '0');
        elsif set_lrck = '1' then
            if test_mode = '1' then
                shift_out <= sin_out;
            else
                shift_out <= data;
            end if;
        elsif clr_bclk = '1' then
            shift_out <= shift_out (14 downto 0) & '0';
        end if;
    end if;
end process;

    -- Audio outputs

    AUD_ADCLRCK    <= lrck;
    AUD_DACLRCK    <= lrck;

    AUD_DACDAT     <= shift_out(15);

    AUD_BCLK       <= bclk;

    -- Self test with Sin wave

    process(clk)
```

```
        begin
            if rising_edge(clk) then
                if reset_n = '0' then
                        sin_counter <= (others => '0');
                elsif lrck_lat = '1' and lrck = '0'    then
                if key = x"00610" then
                    if cnt = "11111001111111" then
                         cnt <= "11111001111111";
                    else
                        if cnt mod 25 = 0 then
                                if sin_counter = "1001111111" then
                                     sin_counter <= "0000000000";
                                else
                                     sin_counter <= sin_counter + 1;
                                end if;
                        end if;
                        cnt <= cnt + 1;
                    end if;
                else
                    if key = x"00c20" then
                        cnt <= "00000000000000";
                        sin_counter <= "0000000000";
--                    elsif key = x"003e0" or key = x"00380" or key = x"00310" or key =
x"002e0" or key = x"00290" or key = x"00250" or key = x"00210" then
--                    elsif music = '1' then
                    else
                        if cnt = "11111001111111" then
                             cnt <= "11111001111111";
                        else
                             cnt <= cnt +1;
                        end if;
                    end if;
                end if;
                end if;
            end if;
        end process;
```

```
        process(clk)
        begin
           if rising_edge(clk) then
              lrck_lat <= lrck;
           end if;
        end process;

        process (clk)
        begin
           if rising_edge(clk) then
              if lrck_lat = '1' and lrck = '0' then
                 audio_request <= '1';
              else
                 audio_request <= '0';
              end if;
           end if;
        end process;

    process (clk)
    variable temp : unsigned(29 downto 0);
    begin
if cnt = "11111001111111" then
      sin_out <=x"0000";
else

  if key = x"00610" then
    if cnt mod 25 = 0    then
       sin_out <= ROM1(to_integer(sin_counter))(15 downto 0);
    else
       temp := (((ROM1(to_integer(sin_counter+1)) -
ROM1(to_integer(sin_counter))))*(cnt mod 25)/25);
       sin_out <= temp(15 downto 0)+ ROM1(to_integer(sin_counter));
    end if;
-- if key = x"003e0" or key = x"00380" or key = x"00310" or key = x"002e0" or key =
x"00290" or key = x"00250" or key = x"00210" then
-- if music = '1' then
  else
```

```
    sin_out <= ROM2(to_integer(cnt mod 48))(15 downto 0);
  end if;
end if;
    end process;

--    with sin_counter select sin_out <=
--        X"0000" when "000000",
--        X"10b4" when "000001",
--        X"2120" when "000010",
--        X"30fb" when "000011",
--        X"3fff" when "000100",
--        X"4deb" when "000101",
--        X"5a81" when "000110",
--        X"658b" when "000111",
--        X"6ed9" when "001000",
--        X"7640" when "001001",
--        X"7ba2" when "001010",
--        X"7ee6" when "001011",
--        X"7fff" when "001100",
--        X"7ee6" when "001101",
--        X"7ba2" when "001110",
--        X"7640" when "001111",
--        X"6ed9" when "010000",
--        X"658b" when "010001",
--        X"5a81" when "010010",
--        X"4deb" when "010011",
--        X"3fff" when "010100",
--        X"30fb" when "010101",
--        X"2120" when "010110",
--        X"10b4" when "010111",
--        X"0000" when "011000",
--        X"ef4b" when "011001",
--        X"dee0" when "011010",
--        X"cf05" when "011011",
--        X"c001" when "011100",
--        X"b215" when "011101",
--        X"a57e" when "011110",
--        X"9a74" when "011111",
```

```
--      X"9127" when "100000",
--      X"89bf" when "100001",
--      X"845d" when "100010",
--      X"8119" when "100011",
--      X"8000" when "100100",
--      X"8119" when "100101",
--      X"845d" when "100110",
--      X"89bf" when "100111",
--      X"9127" when "101000",
--      X"9a74" when "101001",
--      X"a57e" when "101010",
--      X"b215" when "101011",
--      X"c000" when "101100",
--      X"cf05" when "101101",
--      X"dee0" when "101110",
--      X"ef4b" when "101111",
--      X"0000" when others;

end architecture;
```