

C8E

0.1

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# Chapter 1

## File Index

### 1.1 File List

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## Chapter 2

# File Documentation

### 2.1 src/C8E.c File Reference

```
#include <GLUT/glut.h>
#include <stdlib.h>
#include "Logs.h"
#include "Memory.h"
#include "CartridgeReader.h"
#include "Display.h"
#include "CPU.h"
```

#### Functions

- void [printUsage](#) ()
- int [main](#) (int argc, char \*\*argv)

#### 2.1.1 Function Documentation

##### 2.1.1.1 int main ( int *argc*, char \*\* *argv* )

Definition at line 24 of file C8E.c.

##### 2.1.1.2 void printUsage ( )

Definition at line 15 of file C8E.c.

## 2.2 src/CartridgeReader.c File Reference

```
#include "CartridgeReader.h"
#include <stdio.h>
```

### Functions

- int [readCartridge](#) (const char \*const filename, unsigned char \*data)  
*Provide a pointer to the cartridge data.*

### 2.2.1 Function Documentation

#### 2.2.1.1 int readCartridge ( const char \*const filename, unsigned char \* data )

Provide a pointer to the cartridge data.

##### Parameters

in	filename	Point the file to load into memory
out	data	Buffer that eventually receive the cartridge data. It must be initialized and big enough.

##### Returns

The number of bytes read if the file exists, -1 otherwise.

Definition at line 30 of file CartridgeReader.c.

## 2.3 src/CartridgeReader.h File Reference

Define all functions, variables and defines for cartridge management.

### Functions

- int [readCartridge](#) (const char \*const filename, unsigned char \*data)  
*Provide a pointer to the cartridge data.*

### 2.3.1 Detailed Description

Define all functions, variables and defines for cartridge management.

##### Version

0.1



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**Author**

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Definition in file [CartridgeReader.h](#).

**2.3.2 Function Documentation****2.3.2.1 int readCartridge ( const char \*const filename, unsigned char \* data )**

Provide a pointer to the cardridge data.

**Parameters**

in	filename	Point the file to load into memory
out	data	Buffer that eventually receive the cardridge data. It must be initialized and big enough.

**Returns**

The number of bytes read if the file exists, -1 otherwise.

Definition at line 30 of file CartridgeReader.c.

**2.4 src/CPU.c File Reference**

```
#include "CPU.h"
#include <GLUT/glut.h>
#include <stdlib.h>
#include <time.h>
#include "Logs.h"
#include "Display.h"
#include "Memory.h"
```

**Functions**

- void [CPUTick](#) (int)
- int [setupCPU](#) ()
- void [cleanupCPU](#) ()
- void [handleOpCode](#) ()

### 2.4.1 Detailed Description

#### Version

0.1

#### Date

December 13, 2010

#### Author

Maxime Gaudin

Definition in file [CPU.c](#).

### 2.4.2 Function Documentation

#### 2.4.2.1 void cleanupCPU ( )

Definition at line 88 of file CPU.c.

#### 2.4.2.2 void CPUTick ( int *na* )

Definition at line 383 of file CPU.c.

#### 2.4.2.3 void handleOpCode ( )

Definition at line 389 of file CPU.c.

#### 2.4.2.4 int setupCPU ( )

Definition at line 65 of file CPU.c.

## 2.5 src/CPU.h File Reference

### Defines

- #define [MAX\\_STACK\\_SIZE](#) 0xF

*Define the maximum stack size, i.e. the maximum amount of subroutine calls.*

### Functions

- int [setupCPU](#) ()
- void [cleanupCPU](#) ()

### 2.5.1 Detailed Description

#### Version

0.1

#### Date

December 12, 2010

#### Author

Maxime Gaudin

Definition in file [CPU.h](#).

### 2.5.2 Define Documentation

#### 2.5.2.1 #define MAX\_STACK\_SIZE 0xF

Define the maximum stack size, i.e. the maximum amount of subroutine calls.

Definition at line 31 of file CPU.h.

### 2.5.3 Function Documentation

#### 2.5.3.1 void cleanupCPU ( )

Definition at line 88 of file CPU.c.

#### 2.5.3.2 int setupCPU ( )

Definition at line 65 of file CPU.c.

## 2.6 src/Display.c File Reference

```
#include "Display.h"
#include <string.h>
#include <stdlib.h>
#include <GLUT/glut.h>
#include "Logs.h"
```

#### Defines

- #define [SCREEN\\_WIDTH](#) 64

- `#define SCREEN_HEIGHT 32`
- `#define SCREEN_RATIO 10`
- `#define DISPLAY_IDLE_TIME 16`

## Functions

- `void render ()`
- `void reshape (int width, int height)`
- `int setupDisplay (int argc, char **argv)`  
*Setup all display related memory buffer and glut framework.*
- `int cleanupDisplay ()`
- `int clearScreen ()`  
*Clear screen.*

### 2.6.1 Define Documentation

#### 2.6.1.1 `#define DISPLAY_IDLE_TIME 16`

Definition at line 43 of file Display.c.

#### 2.6.1.2 `#define SCREEN_HEIGHT 32`

Definition at line 40 of file Display.c.

#### 2.6.1.3 `#define SCREEN_RATIO 10`

Definition at line 41 of file Display.c.

#### 2.6.1.4 `#define SCREEN_WIDTH 64`

Definition at line 39 of file Display.c.

### 2.6.2 Function Documentation

#### 2.6.2.1 `int cleanupDisplay ( )`

Definition at line 65 of file Display.c.

### 2.6.2.2 int clearScreen ( )

Clear screen.

#### Returns

1 if any pixel has been erase, 0 Otherwise.

Definition at line 110 of file Display.c.

### 2.6.2.3 void render ( )

Definition at line 84 of file Display.c.

### 2.6.2.4 void reshape ( int width, int height )

Definition at line 71 of file Display.c.

### 2.6.2.5 int setupDisplay ( int argc, char \*\* argv )

Setup all display related memory buffer and glut framework.

Definition at line 50 of file Display.c.

## 2.7 src/Display.h File Reference

Define all functions, variables and defines for display management.

### Functions

- int [setupDisplay](#) (int argc, char \*\*argv)  
*Setup all display related memory buffer and glut framework.*
- int [cleanupDisplay](#) ()
- int [drawSprite](#) (unsigned char X, unsigned char Y, const char \*const spriteData, unsigned char len)  
*Display a [len] byte sprite contained into [spriteData] at ([X], [Y]). TECHNICAL DESCRIPTION TODO.*
- int [clearScreen](#) ()  
*Clear screen.*

### 2.7.1 Detailed Description

Define all functions, variables and defines for display management.

**Version**

0.1

**Date**

December 12, 2010

**Author**

Maxime Gaudin

Definition in file [Display.h](#).

### 2.7.2 Function Documentation

#### 2.7.2.1 int cleanupDisplay ( )

Definition at line 65 of file Display.c.

#### 2.7.2.2 int clearScreen ( )

Clear screen.

**Returns**

1 if any pixel has been erase, 0 Otherwise.

Definition at line 110 of file Display.c.

#### 2.7.2.3 int drawSprite ( unsigned char *X*, unsigned char *Y*, const char \*const *spriteData*, unsigned char *len* )

Display a [*len*] byte sprite contained into [*spriteData*] at ([*X*], [*Y*]). TECHNICAL DESCRIPTION TODO.

**Returns**

1 if any pixel has been erase, 0 Otherwise.

#### 2.7.2.4 int setupDisplay ( int *argc*, char \*\* *argv* )

Setup all display related memory buffer and glut framework.

Definition at line 50 of file Display.c.

## 2.8 src/Logs.c File Reference

```
#include "Logs.h"
```

### Functions

- int [setupLogs](#) (int redirect, unsigned char debugLevel, char \*const outputFile-name)  
*Setup output log file and debug level to values passed in paramaters. Moreover, a file descriptor is created and initialized. if [redirect], log are also written in stdout.*
- int [closeLogs](#) ()  
*Close output log file descriptor and flush file buffer.*
- void [addEntry](#) (unsigned char level, const char \*const message)  
*Add new entry in output log file if [level] is below or equal to debug level.*

### 2.8.1 Function Documentation

#### 2.8.1.1 void addEntry ( unsigned char level, const char \*const message )

Add new entry in output log file if [level] is below or equal to debug level.

Definition at line 56 of file Logs.c.

#### 2.8.1.2 int closeLogs ( )

Close output log file descriptor and flush file buffer.

#### Returns

0 if success, 0 otherwise.

Definition at line 50 of file Logs.c.

#### 2.8.1.3 int setupLogs ( int redirect, unsigned char debugLevel, char \*const outputFilename )

Setup output log file and debug level to values passed in paramaters. Moreover, a file descriptor is created and initialized. if [redirect], log are also written in stdout.

#### Returns

0 if success, 0 otherwise.

Definition at line 36 of file Logs.c.

## 2.9 src/Logs.h File Reference

```
#include <stdio.h>
```

### Defines

- #define `DEFAULT_DEBUG_LEVEL` 1  
*Specifies the default debug level : Warning.*
- #define `DEFAULT_OUTPUT_FILENAME` "DEBUG\_LOGS"  
*Specifies the default output filename, i.e. the file where log will be written.*

### Enumerations

- enum `DEBUG_LEVELS` {  
    `ERROR` = 0, `WARNING` = 1, `DRAWING` = 2, `DISASSEMBLY` = 3,  
    `LOW_LEVEL_OPERATION` = 4 }

### Functions

- int `setupLogs` (int redirect, unsigned char debugLevel, char \*const outputFile-name)  
*Setup output log file and debug level to values passed in parameters. Moreover, a file descriptor is created and initialized. if [redirect], log are also written in stdout.*
- int `closeLogs` ()  
*Close output log file descriptor and flush file buffer.*
- void `addEntry` (unsigned char level, const char \*const message)  
*Add new entry in output log file if [level] is below or equal to debug level.*

#### 2.9.1 Define Documentation

##### 2.9.1.1 #define `DEFAULT_DEBUG_LEVEL` 1

Specifies the default debug level : Warning.

Definition at line 23 of file Logs.h.

##### 2.9.1.2 #define `DEFAULT_OUTPUT_FILENAME` "DEBUG\_LOGS"

Specifies the default output filename, i.e. the file where log will be written.

Definition at line 26 of file Logs.h.



## 2.9.2 Enumeration Type Documentation

### 2.9.2.1 enum DEBUG\_LEVELS

Enumerator:

*ERROR*

*WARNING*

*DRAWING*

*DISASSEMBLY*

*LOW\_LEVEL\_OPERATION*

Definition at line 20 of file Logs.h.

## 2.9.3 Function Documentation

### 2.9.3.1 void addEntry ( unsigned char *level*, const char \*const *message* )

Add new entry in output log file if [level] is below or equal to debug level.

Definition at line 56 of file Logs.c.

### 2.9.3.2 int closeLogs ( )

Close output log file descriptor and flush file buffer.

**Returns**

0 if success, 0 otherwise.

Definition at line 50 of file Logs.c.

### 2.9.3.3 int setupLogs ( int *redirect*, unsigned char *debugLevel*, char \*const *outputFilename* )

Setup output log file and debug level to values passed in paramaters. Moreover, a file descriptor is created and initialized. if [redirect], log are also written in stdou.

**Returns**

0 if success, 0 otherwise.

Definition at line 36 of file Logs.c.

## 2.10 src/Memory.c File Reference

Define all functions, variables and defines for memory management.

```
#include "Memory.h"
#include "Logs.h"
#include <stdlib.h>
#include <string.h>
```

### Functions

- int [setupMemory](#) ()  
*Initialize memory to 0.*
- void [cleanupMemory](#) ()  
*Cleanup all memory.*
- int [write](#) (unsigned short addr, unsigned char \*const data, unsigned int len)  
*write [len] bytes from [data] into memory at adress [addr]*
- int [read](#) (short addr, unsigned short len, unsigned char \*const buffer)  
*Read [len] bytes of data from address [addr] to buffer.*

### 2.10.1 Detailed Description

Define all functions, variables and defines for memory management.

#### Version

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#### Date

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#### Author

Maxime Gaudin

Definition in file [Memory.c](#).

### 2.10.2 Function Documentation

#### 2.10.2.1 void [cleanupMemory](#) ( )

Cleanup all memory.

Definition at line 39 of file Memory.c.

### 2.10.2.2 int read ( short *addr*, unsigned short *len*, unsigned char \*const *buffer* )

Read [*len*] bytes of data from address [*addr*] to buffer.

#### Parameters

in	<i>addr</i>	Address where read begins
in	<i>len</i>	Number of bytes read
out	<i>buffer</i>	Pointer to the data buffer

#### Returns

0 if success, 1 otherwise.

Definition at line 56 of file Memory.c.

### 2.10.2.3 int setupMemory ( )

Initialize memory to 0.

#### Returns

0 if success, 1 otherwise.

Definition at line 28 of file Memory.c.

### 2.10.2.4 int write ( unsigned short *addr*, unsigned char \*const *data*, unsigned int *len* )

write [*len*] bytes from [*data*] into memory at adress [*addr*]

#### Parameters

in	<i>addr</i>	Address where data will be written
in	<i>data</i>	Pointer to data buffer
in	<i>len</i>	Number of byte written

#### Returns

0 if success, 1 otherwise.

Definition at line 44 of file Memory.c.

## 2.11 src/Memory.h File Reference

### Defines

- #define [RESERVED\\_MEMORY\\_START](#) 0x0  
*Specifies where memory starts (0x0, what a surprise isn't it ??).*

- `#define RESERVED_MEMORY_STOP 0x200`  
*Specifies where the memory stops.*
- `#define DATA_SPACE_START 0x200`  
*Specifies the beginning of the data space.*
- `#define DATA_SPACE_STOP 0xFF`  
*Specifies the end of the data space.*
- `#define MAX_REGISTERS 0xF`  
*Specifies the maximum number of registers..*

## Functions

- `int setupMemory ()`  
*Initialize memory to 0.*
- `void cleanupMemory ()`  
*Cleanup all memory.*
- `int write (unsigned short addr, unsigned char *const data, unsigned int len)`  
*write [len] bytes from [data] into memory at adress [addr]*
- `int read (short addr, unsigned short len, unsigned char *const buffer)`  
*Read [len] bytes of data from address [addr] to buffer.*

### 2.11.1 Define Documentation

#### 2.11.1.1 `#define DATA_SPACE_START 0x200`

Specifies the beginning of the data space.

Definition at line 36 of file Memory.h.

#### 2.11.1.2 `#define DATA_SPACE_STOP 0xFF`

Specifies the end of the data space.

Definition at line 38 of file Memory.h.

### 2.11.1.3 #define MAX\_REGISTERS 0xF

Specifies the maximum number of registers..

Definition at line 41 of file Memory.h.

### 2.11.1.4 #define RESERVED\_MEMORY\_START 0x0

Specifies where memory starts (0x0, what a surprise isn't it ??).

Definition at line 31 of file Memory.h.

### 2.11.1.5 #define RESERVED\_MEMORY\_STOP 0x200

Specifies where the memory stops.

Definition at line 33 of file Memory.h.

## 2.11.2 Function Documentation

### 2.11.2.1 void cleanupMemory ( )

Cleanup all memory.

Definition at line 39 of file Memory.c.

### 2.11.2.2 int read ( short *addr*, unsigned short *len*, unsigned char \*const *buffer* )

Read [*len*] bytes of data from address [*addr*] to *buffer*.

#### Parameters

in	<i>addr</i>	Address where read begins
in	<i>len</i>	Number of bytes read
out	<i>buffer</i>	Pointer to the data buffer

#### Returns

0 if success, 1 otherwise.

Definition at line 56 of file Memory.c.

### 2.11.2.3 int setupMemory ( )

Initialize memory to 0.

#### Returns

0 if success, 1 otherwise.

Definition at line 28 of file Memory.c.

**2.11.2.4** `int write ( unsigned short addr, unsigned char *const data, unsigned int len )`

write [len] bytes from [data] into memory at adress [addr]

**Parameters**

<code>in</code>	<code><i>addr</i></code>	Address where data will be written
<code>in</code>	<code><i>data</i></code>	Pointer to data buffer
<code>in</code>	<code><i>len</i></code>	Number of byte written

**Returns**

0 if success, 1 otherwise.

Definition at line 44 of file Memory.c.

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