



# The Spectrum System

User manual

Copyright © 2024 Retro Games Ltd.

All rights reserved.

No part of this publication may be reproduced, stored, or transmitted in any form or by any means, without the express prior written permission of Retro Games Ltd.

Produced by Paul Andrews, Darren Melbourne and Chris Smith.  
Hardware, software, audio, industrial and UX design by Chris Smith.  
Software engineering by Dylan Smith, Flinn Fraher.  
Licensing by Darren Melbourne and Sophie Walker.  
Graphic design by Jen Carling and Havey Badcock.  
Project management by Stuart Chiplin.  
Manufacturing management by Ben Jones.  
Marketing direction by Simon Turner.  
Music by YERZMYEY.

The Spectrum is a registered trademark of Retro Games Ltd. All other trademarks and copyrights are the property of their respective owners. All rights reserved.

Head Over Heels © 1987 Atari Interactive, Inc.

The Hobbit and the names of the characters, places, events and items therein, are trademarks and or registered trademarks of Middle-earth Enterprises, LLC ("MEE") used by Retro Games Ltd. under license from MEE. © 2024 MEE. All rights reserved.

The terms HDMI and HDMI High-Definition Multimedia Interface, and the HDMI logo are trademarks or registered trademarks of HDMI Licensing Administrator, Inc. in the United States and other countries. All other trademarks and copyrights are the property of their respective owners.

The product complies with all relevant European directives (2004/108/EC, 2006/95/EC) when installed and used in accordance with the user manual. This product can only be serviced and repaired by qualified personnel. This product has no user serviceable parts.

The crossed-out wheelie bin symbol confirms that your product should not be disposed of with your general household waste, but should be taken to your nearest recycling centre for safe and responsible disposal. This will help prevent any potential negative impact on the environment and on human health and is in compliance with current EU legislation. Please contact your local authority or retailer for further recycling advice.

Retro Games Ltd. cannot be held responsible for any errors found in the supplied games. Retro Games Ltd. reserves the right to change without notice the specification of this product and the content of this manual to reflect any such changes. The latest version of the manual will always be available from the Retro Games Ltd. website at <https://retrogames.biz/links/thespectrum>, which we encourage you to visit for warranty information, full game instructions, guides, articles and firmware upgrades. Whilst every care has been taken to verify the accuracy of the information and links provided in this guide, we cannot be held liable or responsible for any loss, damage or inconvenience caused as a result of any inaccuracies.

The Spectrum User Manual – v1.0.1

**retro**

spectrum

The  
@

**User manual**

# Contents

## CHAPTER 1

### **Introduction.** *Page 7*

An overview of The Spectrum.

## CHAPTER 2

### **Setting up The Spectrum.** *Page 9*

Setting up The Spectrum for the first time.

## CHAPTER 3

### **The game carousel.** *Page 13*

Navigating the carousel of games and playing games.

## CHAPTER 4

### **Saving and loading suspended games.** *Page 17*

Saving and restoring your progress using Saved Game slots.

## CHAPTER 5

### **Rewinding game play.** *Page 19*

How to rewind your gameplay to an earlier point in time.

## CHAPTER 6

### **Options and settings.** *Page 21*

Customising gameplay experience with border sizing, decorative frames, extended colours, and a CRT filter.

## CHAPTER 7

### **Loading your own programs.** *Page 29*

Running the programs you own from a USB stick.

## CHAPTER 8

### **Adjusting the settings of a program.** *Page 35*

Setting up and customising how a program runs from a USB stick.

## CHAPTER 9

### **Cassette tape navigation.** *Page 41*

How to rewind, forward, stop and start the virtual cassette tape.

## CHAPTER 10

### **Classic mode.** *Page 43*

An introduction to using The Spectrum's Classic Mode.

## CHAPTER 11

### **Saving programs and data.** *Page 49*

How to store your programs on a virtual cassette tape.

## CHAPTER 12

### **Using the virtual keyboard.** *Page 55*

How to type characters using a gamepad or joystick.

## CHAPTER 13

### **Updating the firmware.** *Page 57*

Downloading and installing firmware updates.

## CHAPTER 14

### **Using your own peripherals.** *Page 59*

Connecting other devices to The Spectrum.

## CHAPTER 15

### **Troubleshooting.** *Page 61*

Answers to common support questions.

## CHAPTER 16

### **Precautions.** *Page 63*

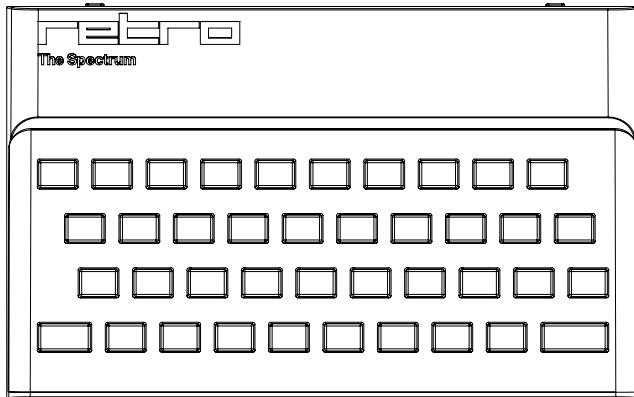
Keeping safe while using The Spectrum.



# CHAPTER 1

## Introduction

The Spectrum is a modern recreation of the Sinclair ZX Spectrum personal computer series first released in 1982. The Spectrum is instantly reminiscent of the original 16 and 48K ZX Spectrum with a fully functional rubber keyboard. Looks can be deceiving however, as The Spectrum is packed with features that were only to be found on later Spectrum models, including additional memory and improved sound, and its HDMI and USB ports make it plug-and-play with today's technology.



The Spectrum comes preloaded with 48 of the best genre defining games made for the ZX Spectrum, all fully licensed and ready to launch from the easy to use carousel, plus you can easily play any ZX Spectrum games you own from a USB stick.

Alternatively boot up into Classic Mode and experience the immersive world of Spectrum BASIC programming.

***The Spectrum is everything you loved, and better than ever.***



# CHAPTER 2

## Setting up The Spectrum

### ***Unpacking the box***

Before connecting any cables, check the contents of the packaging:

- The Spectrum
- HDMI cable
- USB power cable
- The Spectrum Introduction book

You will also need to have the following items available (not included):

- A monitor or TV with an HDMI port, capable of displaying a 720p resolution
- A USB compatible 5V/1A (5W) output power adapter

### ***Connecting The Spectrum***

Make sure your monitor or TV is switched off before you connect The Spectrum.

### ***Turning The Spectrum on and off***

Switch the TV source to the appropriate HDMI input and press the power button at the rear of The Spectrum. The rear power indicator will illuminate red, and the TV will show the welcome logo.

To turn off The Spectrum, press and hold the power button for two seconds or select Shutdown from the options menu.

### ***User interface navigation***

To navigate the user interface and menus, use the keyboard and follow the on-screen prompts and key hints displayed at the bottom of the screen.

The keys **O**, **P**, **Q**, **A** and **M** are used to navigate left, right, up, down and select items, however the labelled cursor keys **5**, **8**, **7**, **6** and **0** can also be used.

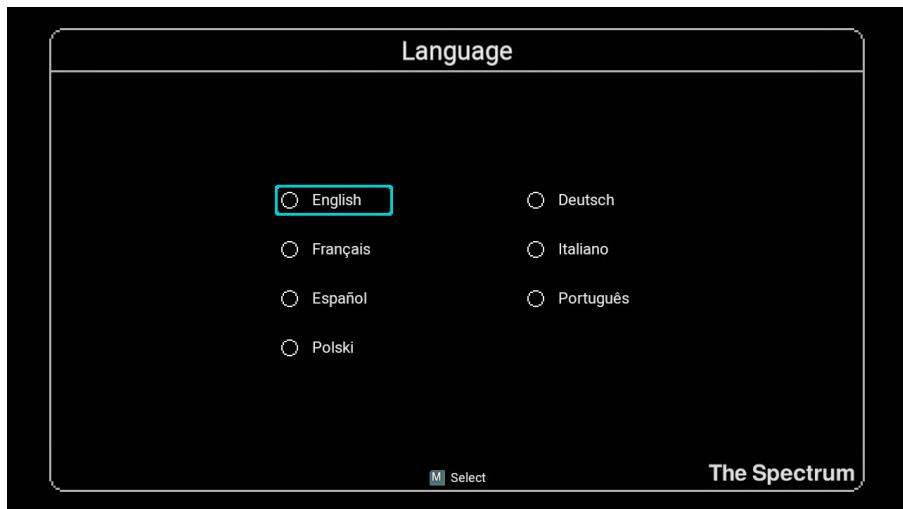
If you have a game controller connected you can use this to navigate the menus, and the on-screen key hints will change to button hints as appropriate.

## ***First-time setup***

The first time you turn on The Spectrum you will be asked a few questions about some essential settings needed to get you going with your new The Spectrum.

### ***Language***

The Spectrum first asks you to select your preferred language. Move the selector to the language you want and press **M**.

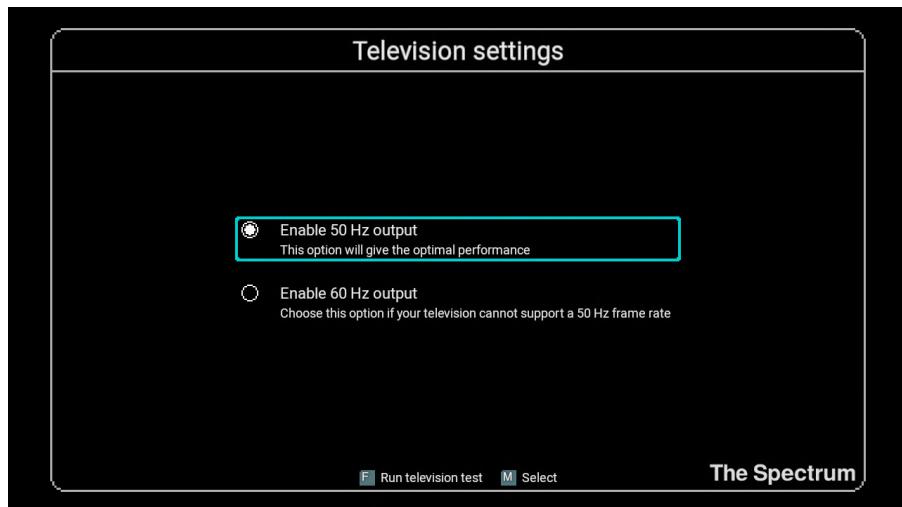


When you have made your selection, press **B** to move on to Television settings.

**Note:** This will only set the language of the user interface since the built-in games will be in English, with the exception of choosing *Español* where some of the carousel games will show in-game text in Spanish. See **Chapter 6 - Language**.

## Television settings

To complete the set up, The Spectrum will ask you to choose the video output requirement of your television, either 50 or 60Hz. Move the selector to the required video output mode and select it by pressing **M**.



**Note:** It is recommended that you choose 50Hz for the best experience, if your TV supports it.

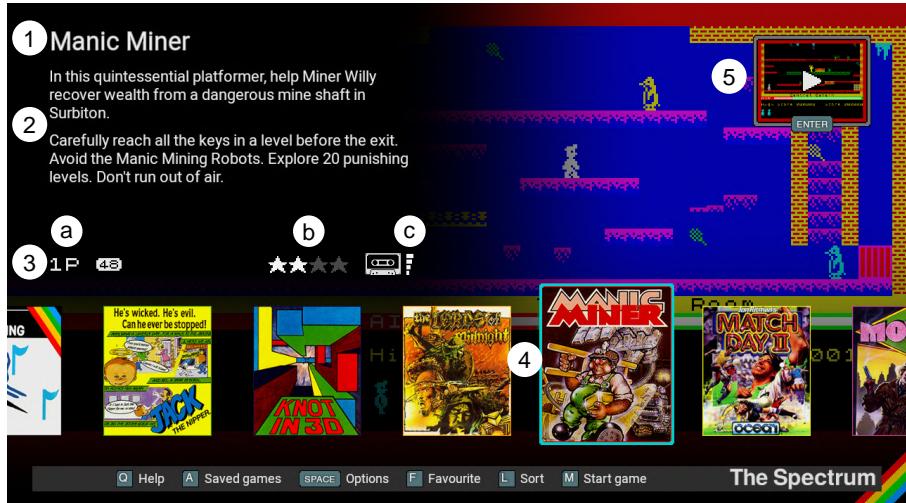
Before you can proceed, you must test and confirm that your TV will work with the chosen video output mode by pressing **F**. The Spectrum will perform the test by switching to the chosen video output mode for 20 seconds. When the test starts you may see your TV screen go blank for a few seconds.

If your TV successfully resumes displaying the Television settings menu with the new mode selected, press **L** to accept the mode. If the video test is not successful, identified by whether or not you can clearly see the Television settings menu during the test, wait until the test completes and The Spectrum reverts to the previous output mode.



# CHAPTER 3

## The game carousel



- 1) Current game title
- 2) Current game description
- 3) Current game information icons
  - a) Number of players icon  
This shows 1P for single player games, 2P for two player games, and 2P+ for games that can have more than two players.
  - b) Favourite stars  
This shows the number of favourite stars you have given this game.
  - c) Saved games indicator  
This shows whether any saved games have been stored for this game. The number of filled rectangles on the right hand side shows how many of the four saved game slots are occupied.
- 4) Carousel of games  
This carousel shows the box covers of the games included in The Spectrum, with the current game highlighted.

## 5) Suspended game

While a game is suspended, a miniaturised view of the suspended game is shown floating at the top-right of the screen. This suspended game may be resumed or saved into one of four slots per game.

## **Selecting a game**

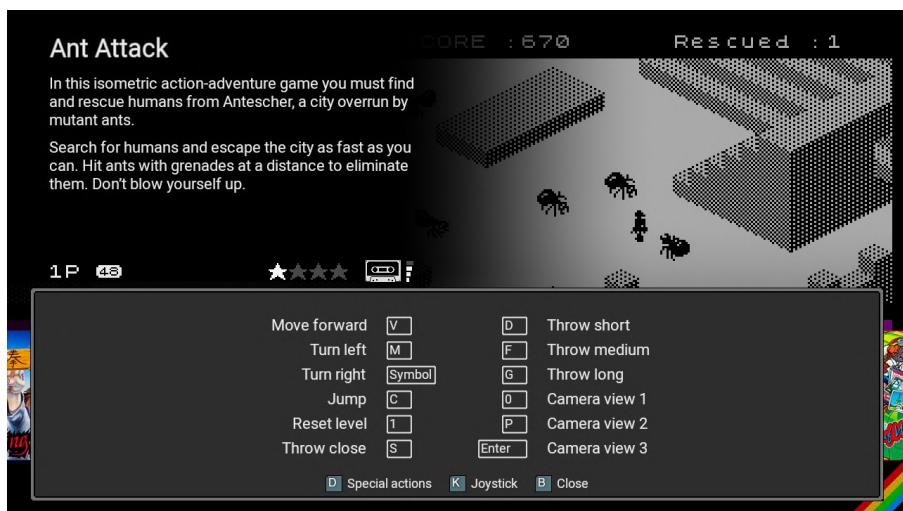
Use **O** and **P** to scroll through the carousel and select the game you want. As each game is selected, the game title, description and information icons displayed at the top-left of the screen will update accordingly.

## **Give a game a favourite rating**

Press **F** to add a favourite star to the current game. If the game already has four stars, this will reset the number of stars to zero.

## **Sorting the carousel**

Press **L** to sort the carousel of games by different criteria. These are Title (the default), Author, Genre, Year of release, Publisher, and number of Favourite stars.



## ***Getting help for a game***

Press **Q** to view the control help for the current game. This will show a table of keyboard controls for the game if you are using the keyboard, or if you are using a game controller, a diagram with each button labelled with its function within the game.

Pressing **K** will switch between keyboard and game controller views. Special actions are available across all games, such as showing the virtual keyboard or rewinding game play. To see which keys and buttons activate these actions, which are common to all games, press and hold **D**.

For full instructions on how to play each of the 48 included games, visit [retrogames.biz/links/games/thespectrum](http://retrogames.biz/links/games/thespectrum)



## ***Playing a game***

Select the game you wish to play from the carousel using the **O** and **P** and press **M** to start it from the beginning.

If a game is started before a suspended game is saved, the suspended game will be discarded.

ZX Spectrum games were all designed to be played with a keyboard since a joystick and joystick interface were optional. The most popular joystick interface was the Kempston, which is the default with The Spectrum, so if you wish to play a carousel game with a game controller, most require you to select Kempston joystick from the in-game options. For some games Kempston is not applicable, so refer to the full game instructions as described in Getting help for a game above.

## ***Exiting and suspending a game***

To suspend a game and return to the Game carousel, press **HOME** or the power button once. A miniaturised view of the suspended game will appear floating in the top-right corner of the screen.

**Tip:** Try not to suspend a game while in the middle of an intense action phase, as this can result in a game that is difficult to play when resumed.

## ***Resuming a suspended game***

Press **ENTER** or the **HOME** button to resume the currently suspended game.

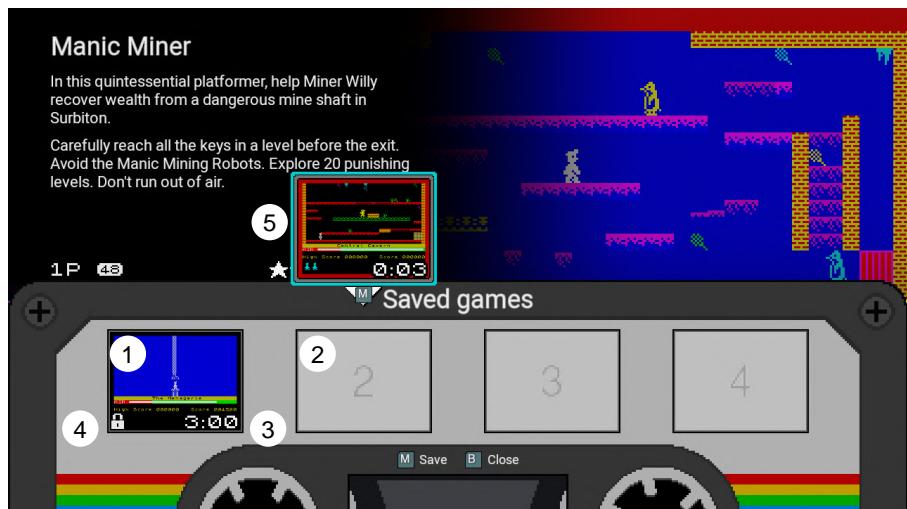


# CHAPTER 4

## Saving and loading suspended games

Pressing **A** when viewing the carousel will show the Saved game slots for the current game, where you can save a suspended game or resume a previously saved game.

Each game has four slots for saved games, represented by four sections of a cassette tape label.



- 1) Filled saved game slot
- 2) Empty saved game slot
- 3) Elapsed game time
- 4) Locked game slot indicator
- 5) Suspended game

### ***Saving a game***

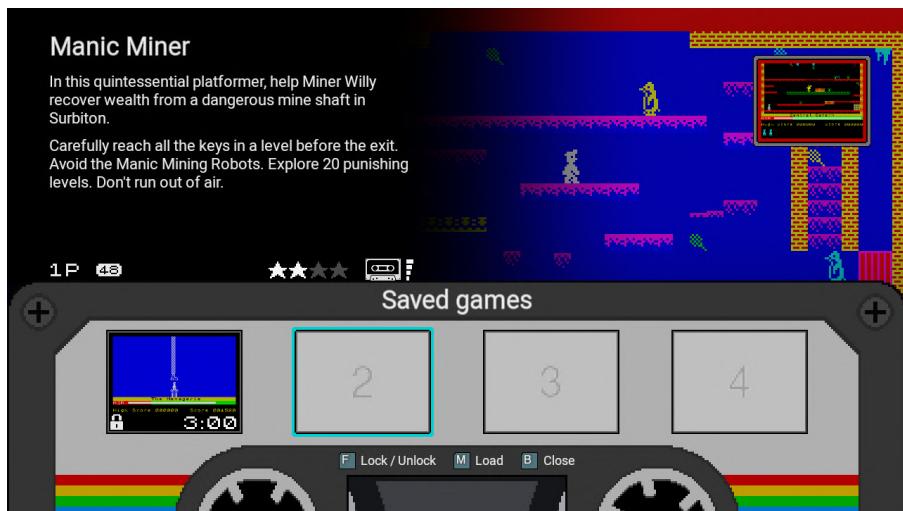
If there is a currently suspended game, the miniaturised suspended game will move down and hover above the first available Saved game slot (either the first blank slot or otherwise the first unlocked slot). Pressing **O** or **P** will move the hovering suspended game to another slot.

Press **M** to save the game in the chosen slot. This will overwrite any game already in that slot. If a slot has been locked you will not be able to save a game into that slot until you unlock it (see **Locking/unlocking a saved game slot**).

## **Loading a game**

If there is a currently suspended game, the miniaturised suspended game will move down and hover above the first available Saved game slot. If this is the case and you want to discard it and load a previously saved game, press **Q** to move the selector down to one of the occupied game slots.

If the current game is not suspended, the selector will automatically move down to one of the occupied game slots.



Press **O** or **P** to select the saved game you wish to resume, and press **M** to load it.

**Note:** Loading a previously saved game will discard a suspended game that is unsaved.

## **Locking/unlocking a saved game slot**

Move the selector to one of the occupied saved game slots and press **F** to lock that slot. This will prevent any game from being saved into that slot. Press **F** on an already locked slot to unlock it.

# CHAPTER 5

## Rewinding gameplay

While playing a game, pressing **HOME + O** will interrupt the game play and bring up the rewind controls on the left hand side of the screen. This allows you to rewind your game play by up to 40 seconds. You can rewind game play at any time, even after resuming a suspended or saved game.



Key	<i>Rewind function</i>
O	Step gameplay back by 10 seconds
P	Advance gameplay by 10 seconds
B	Continue the game from the current point in the rewind display.
X	Cancel rewind and continue the game from where gameplay was interrupted.
Y	Toggle pause of the replay on and off.

When you step back through the gameplay, The Spectrum will replay from that point. The current position in the rewind history is shown in the top left corner of the screen, and reflects the duration by which the gameplay has been rewound.

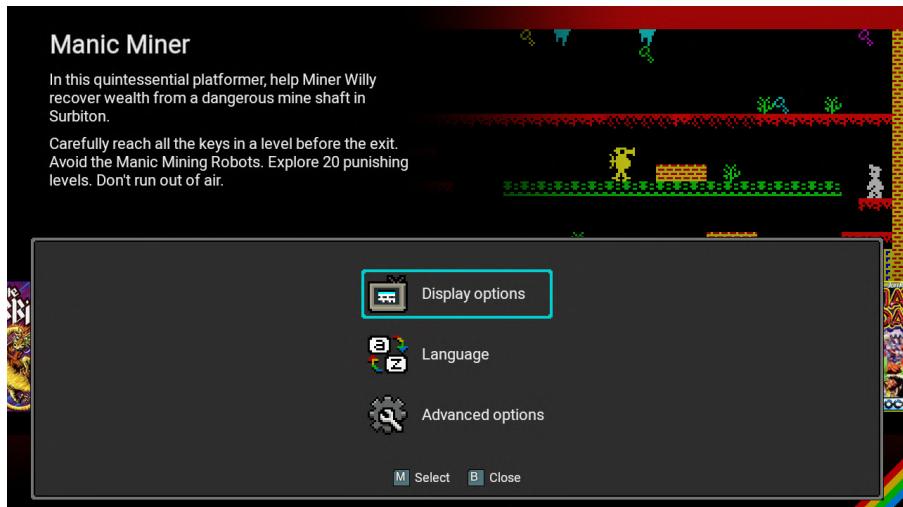


When you reach the point from which you wish to continue playing, press **B**. The Spectrum will display a 3-2-1 countdown, preparing you to take over the gameplay.

# CHAPTER 6

## Options and settings

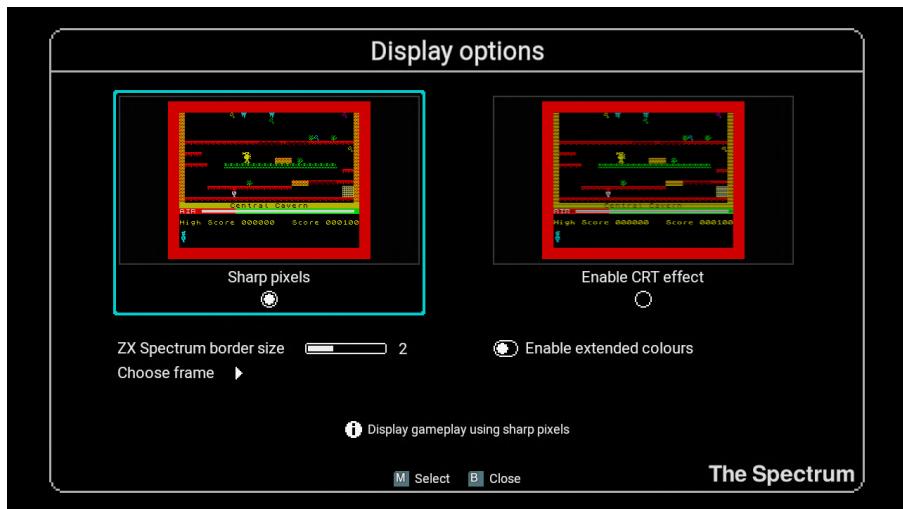
Press **SPACE** on the game carousel to show the Options menu. These options control the operation of the entire console.



Move the selector with **Q** or **A** and press **M** to select a menu option. Press **B** to close and back out of any menu.

## Display options

This menu contains options to control how a game's image is displayed on the TV.



Option	Description
Sharp pixels	This will display the game play using square-edged pixels for a clean, sharp image with no scanlines.
Enable CRT effect	Enables an effect that simulates the scan lines of a classic CRT screen while softening the edges of the pixels.
ZX Spectrum border size	Adjust how much of the ZX Spectrum coloured border is displayed. Particularly useful when choosing to surround the gameplay with an attractive frame.
Enable extended colours	Enables ULAPlus™ colour support which increases the number of colours The Spectrum is able to display. Turning this option on activates the alternate colour palettes that have been individually designed for each game on the carousel.
Choose frame	Select an attractive frame to surround your game play.

**Note:** These options only affect the appearance of the game image when being played, not the game carousel, menus or virtual keyboard.

## ZX Spectrum border size

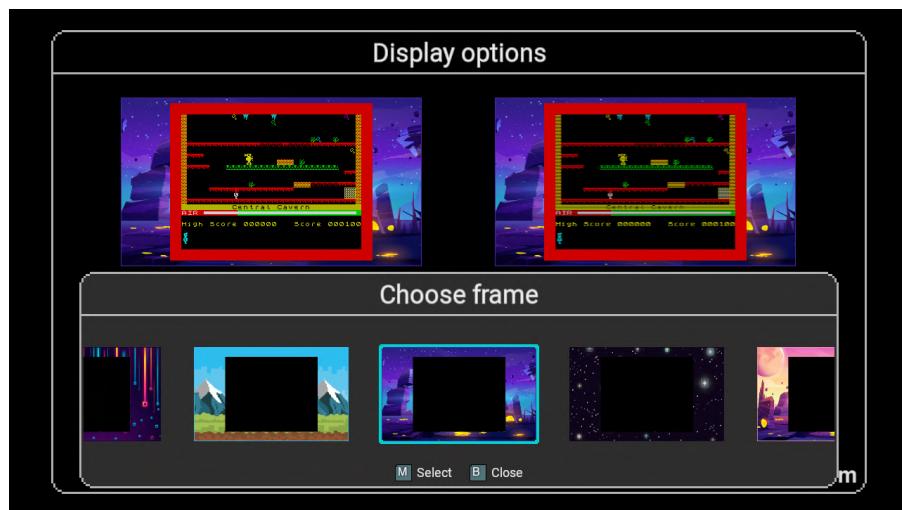
The ZX Spectrum was renowned for having a colourful border around the gameplay, particularly while loading programs from cassette where the border would flash with stripey coloured lines. Games often set the border colour to match the gameplay and so the border can sometimes play an important part of the gameplay experience, other times the border is just a static colour.

This option allows you to set how much of the ZX Spectrum border is shown. If you have selected a graphical frame to be displayed around the gameplay then you may want to adjust how much of the ZX Spectrum border is displayed, from no border at all to full.

### Choose Frame

To remove the black border surrounding the game play area, you can choose to have the game play displayed within an attractive background.

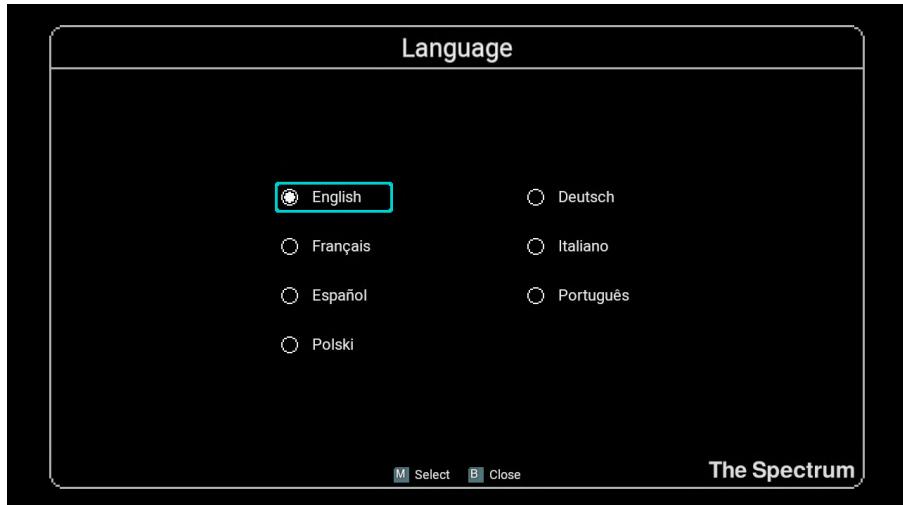
Select **Choose frame** to reveal a carousel of frame images that you can browse using **O** and **P**.



Press **M** to select an image, which will change the frame around the example screenshots shown above. When you are happy with your chosen frame, press **B** to return to the Display Options menu.

## Language

This menu allows you to change the language The Spectrum uses to display the game descriptions and menus. The choices are English, Deutsch, Français, Italiano, Español and Polski.

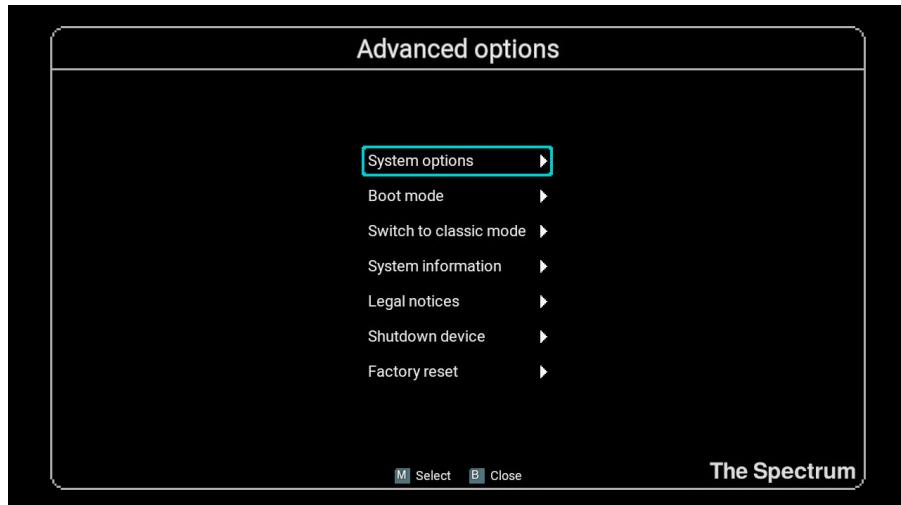


Changing language does not affect the 48 included games, which are in English. However, the following games will show in-game text in Spanish if Español is selected as the system language:

- 1) Alien Girl
- 2) Army moves
- 3) Devwill Too
- 4) Freddy hardest
- 5) Phantis / Game Over II

## Advanced options

This menu contains options for more advanced users and rarely used functions.



### System options

This menu controls system settings, and allows you to adjust the volume level of the menu music. This does not affect the volume of a game's audio.

To increase the level of the volume slider press **M**, and to decrease the volume slider press **F**.

### Boot mode

The Spectrum can operate in two modes:

1) **Carousel mode**

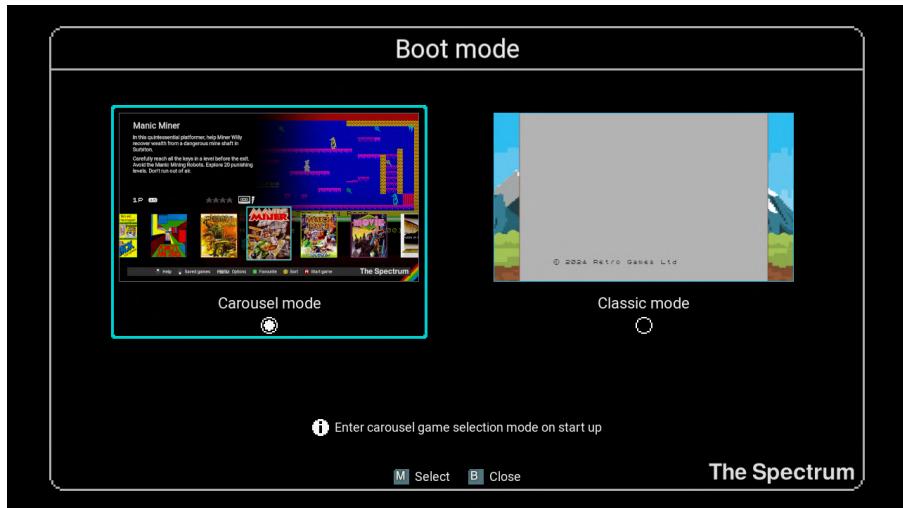
Browse and play the 48 included games and easily launch the games you own from a USB stick.

2) **Classic mode**

Experience The Spectrum as though it was an original ZX Spectrum, complete with BASIC programming and virtual cassette tape access.

See **Chapter 10 - Classic mode**.

The **Boot mode** menu allows you to change whether The Spectrum starts in Classic mode or Carousel mode when you turn the power on.



Changes made to the **Boot mode** configuration take effect the next time you power on The Spectrum.

### **Switch to classic mode**

Switch The Spectrum into Classic mode, where it operates as though it is an original ZX Spectrum, complete with BASIC programming and virtual cassette tape access. For full details see **Chapter 10 - Classic mode**.

### **System information**

This shows The Spectrum's current firmware build, and will also allow you to upgrade to a newer firmware build if one is present on an inserted USB stick (see **Chapter 13 - Updating the firmware**).

### **Legal notices**

This option displays the legal notices relevant to The Spectrum. The text may be scrolled up and down using **Q** and **A**.

## ***Shutdown device***

This option safely shuts down The Spectrum. This will discard a suspended game that is unsaved and power off the device. Alternatively, you can shutdown the device by pressing and holding the power button for two seconds.

## ***Factory reset***

This will reset all settings to their default values and erase all saved games for the 48 installed games. This function can also be initiated by holding the power button down while The Spectrum powers on.

A factory reset will not revert any firmware upgrades, nor will this erase the Saved game slots and settings for user supplied programs held on USB stick.

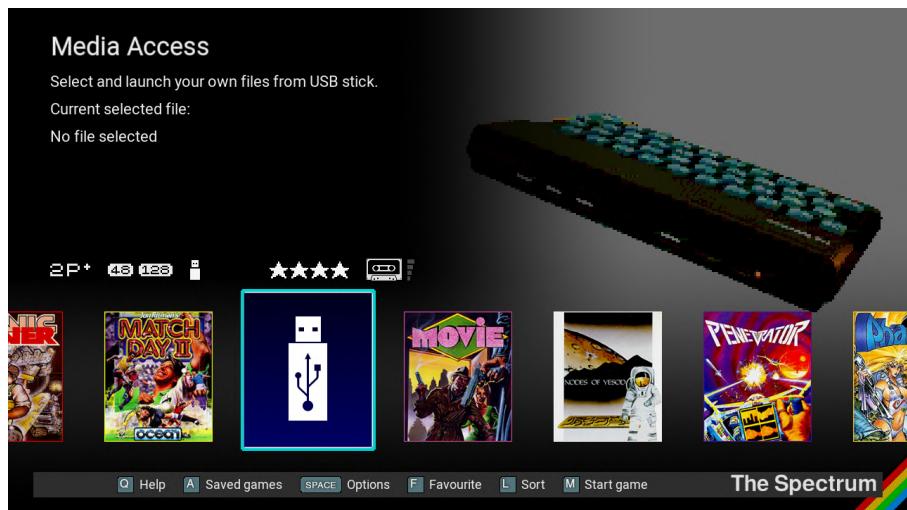


# CHAPTER 7

## Loading your own programs

The Spectrum allows you to load programs you own from a USB stick.

When you insert a USB stick into The Spectrum, an additional carousel item will appear titled **USB Media Access**. Selecting this item and press **M** to browse and run programs from the USB stick.

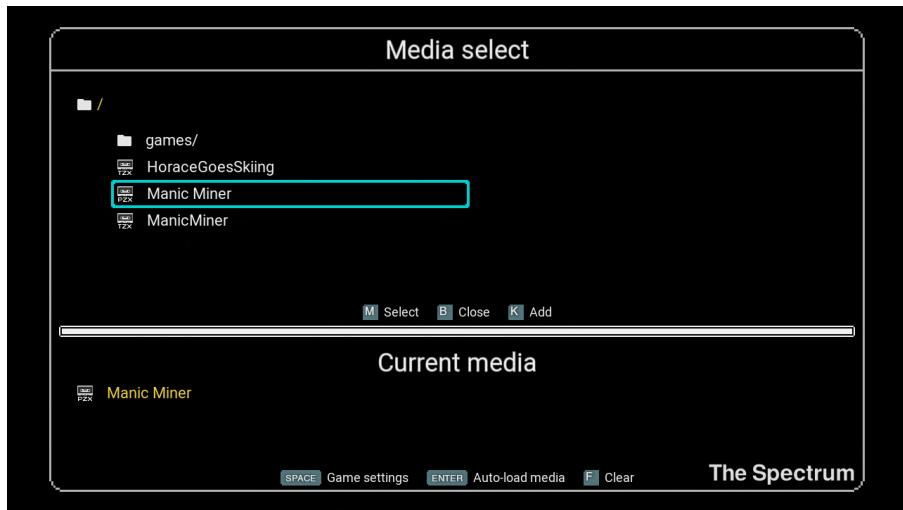


**Note:** The USB stick must be formatted using the FAT32 filesystem type for it to be detected by The Spectrum.  
See [retrogames.biz/links/support/thespectrum](http://retrogames.biz/links/support/thespectrum)



### Browsing programs on the USB stick

Selecting the **USB Media Access** carousel item will launch a file browser that you can use to navigate to and load your own program files.



Folders and files with the following ZX Spectrum media file extensions will be shown:

Type	File extension
Cassette Tape	.tap .tzx .pzx
Cartridge	.rom
Snapshot	.szx .z80 .sna
Playlist	.m3u

Use **O**, **P**, **Q** and **A** to navigate through the contents of the USB stick. To select a program or descend into a folder, press **M**. To step back out of a folder, press **L**.

Once you have selected the program, its filename will be displayed in the Current media section at the bottom of the screen. To start the selected program press **ENTER**, and to adjust its settings press **SPACE**.

To return to the Game carousel press **B**. The description shown for the USB Media Access carousel title will reflect the Current media filename.

### ***Cassette file support***

The Spectrum supports the three common cassette file formats.

Files ending with **.tzx** and **.pzx** are a digital facsimile of the original audio cassette tape and reproduce the loading experience of the original cassette, including the

beeps, flashing screen border, visual loading effects and delay while the data is loaded. Alternatively, .tap files simply contain the program that was encoded onto the cassette tape and so load instantly.

Each cassette file will show TAP, PZX or TZX below the cassette icon to indicate the type.

### ***Cartridge file support***

A handful of software titles were produced as cartridges to be used with the Sinclair Interface 2, an accessory for the ZX Spectrum produced by Sinclair research. Cartridge files will have a .rom extension and should not be confused with operating system ROM files that have the same extension.

### ***Snapshot file support***

The Spectrum supports the .sna snapshot format that was commonly used by third-party ZX Spectrum peripherals such as the Multiface range, which were able to dump the ZX Spectrum memory to external storage.

Also supported are the more reliable snapshot formats .z80 and .szx that were later developed for use with ZX Spectrum emulators.

All of these formats load instantly.

### ***Multi-cassette game support***

The Spectrum supports the loading of multi-cassette games by allowing you to select multiple cassette files at once, and flip between them while the game is running.

When you select a cassette file from the USB stick contents list by pressing **M**, the behaviour is to replace the previously selected cassette file. To select multiple cassette files (for example cassette 1 of 3, cassette 2 of 3 and cassette 3 of 3) you first select cassette file 1 by pressing **M** and then add the additional cassettes tape files 2 and 3 by pressing **K**.

Launch the game in the usual way by pressing **ENTER**. When prompted to change cassettes by the game, press and hold the **HOME** button and then press **S**. This will advance the “inserted” cassette to cassette 2, then to cassette 3, then back to cassette 1, and so on.

You can choose a maximum of three cassette files at once through this method, so for games with four or more cassettes, a playlist file is required.

## Playlists

A playlist makes choosing multi-cassette games a quick single click and avoids issues with mis-selecting files. They are required for games having more than three cassettes, but can be used for games having fewer.

A playlist is a text file with an `.m3u` extension, and it merely lists all the `.tap/.tzx/.pzx` files for the game, such as:

```
Game A tape 1 of 2.tap
Game A tape 2 of 2.tap
```

The filenames within the playlist can also contain file paths relative to the playlist file location, which give the flexibility of placing the `.tap` (or `.tzx` and `.pzx`) files in a different folder to keep the playlist folder uncluttered.

For example, you could place your `.tap` files in an `TAP Files` sub-folder, with the playlists created at the parent level:

```
/USB stick/TAP Files/Game A tape 1 of 2.tap
/USB stick/TAP Files/Game A tape 2 of 2.tap
/USB stick/TAP Files/Game B tape 1 of 2.tap
/USB stick/TAP Files/Game B tape 2 of 2.tap
/USB stick/Game A.m3u
/USB stick/Game B.m3u
```

The playlist file `Game A.m3u` contains two lines as follows (note that the file paths are relative, so there is no leading path separator '/'), as follows:

```
TAP Files/Game A tape 1 of 2.tap
TAP Files/Game A tape 2 of 2.tap
```

Being relative paths, you can move this around easily so long as the example `TAP Files` folder stays at the same level as the playlist file.

**Note:** The playlist file paths use forward-slash (/) as the path separator, not the Windows backslash (\).

To launch a game through its playlist, navigate to it in the usual way, select it with **M** and then launch the game with **ENTER**.

Once launched, whenever you want to switch to another cassette file listed in the playlist, press and hold the **HOME** button and then press **S**.

## ***Saving or loading a suspended USB stick program***

For USB stick programs, the procedure for loading a previously Saved game is slightly different to that for games on the carousel.

When the USB Media Access carousel item is selected, pressing **A** from the Game carousel will show the Saved game slots for the program currently selected on the USB stick, as shown in the game description for the USB Media Access title.

Therefore, to load or save a suspended user program, you first need to make sure it is the one currently selected on the USB stick.

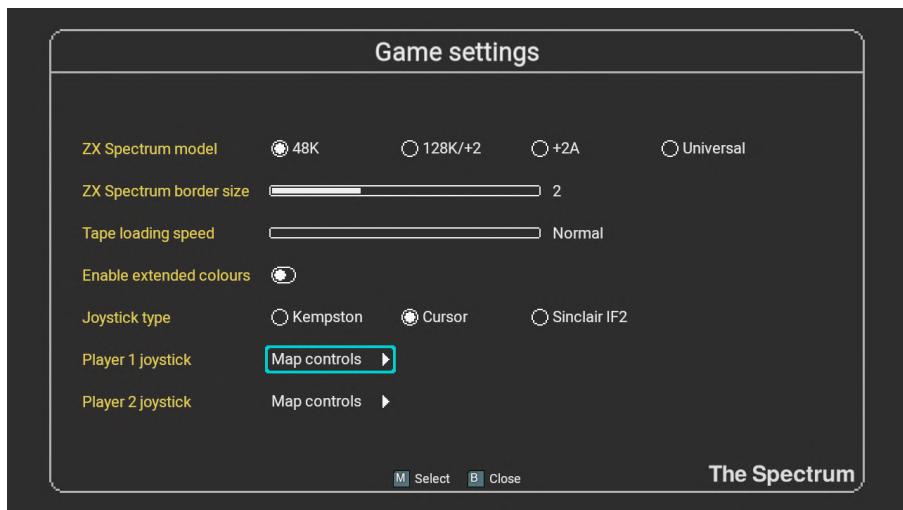
If you are using a multi-tape program, then switching to the second or third cassette tape will change which save game slots are shown. Should you need the same four save game slots to be shown for all files that make up the multi-tape game, set up a playlist containing the multiple tape files.



# CHAPTER 8

## Adjusting the settings of a program

Once you have selected a program to launch, you may modify settings such as the machine model, joystick controls and border size before auto-loading the program, by pressing **SPACE**. These settings can also be changed for the currently suspended program if it was auto-loaded.



For controls that have a slider value, press **M** to increase the value and **F** to decrease the value.

### **ZX Spectrum model**

This option allows you to select the ZX Spectrum model on which you wish to run the selected program. The default is the **48K**, though The Spectrum will try and guess by looking at the filename.

The **128K**, **+2** and **+2A** ZX Spectrum models are almost identical in functionality and features, but as they were produced at different times during the life of the ZX Spectrum, subtle changes in design meant that slight compatibility differences were introduced. Games often had to be modified by the publisher and re-released when a new version of the ZX Spectrum went on sale. Therefore it is often necessary to select the ZX Spectrum model for which the program file is intended. To assist the model selection, The Spectrum provides a **Universal** model which minimises these compatibility issues by providing a model that is a blend of all the others, and should work in most cases.

### ***ZX Spectrum border size***

This option allows you to select how much of the ZX Spectrum border is shown around the gameplay and overrides the default value that has been set in Display Options.

### ***Tape loading speed***

Both **.tzx** and **.pzx** cassette files will normally load at their original speed, which can take over ten minutes for a 128K program in a worst case scenario. By increasing the **Tape loading speed** you can accelerate time and reduce this period significantly. Any on-screen animations and loading effects will similarly be sped up while loading proceeds, returning to normal speed once the loading process has completed.

### ***Enable extended colours***

This option takes its default from Display Options and controls whether ULAPlus™ palette support is enabled for the program. Some modern games have been written with ULAPlus™ support and will automatically detect that it is present and provide a richer colour palette. You can still make use of an extended colour palette even if the game is not ULAPlus™ aware by pre-loading a palette file before loading the game itself.

**Note:** A modern game that has been written using the “Arcade Game Designer” tool will be ULAPlus™ aware, however the game author may not have provided a colour palette, in which case the default AGD palette will be used and the colours will look strange and messy. In this case disable extended colours for this game.

### ***Selecting the joystick type***

The original ZX Spectrum computer did not provide any joystick ports and instead allowed the user to provide their own joystick interface adapter, plugged into the rear of the machine.

There were several vendors of joystick interface, each having its own way of communicating with the ZX Spectrum, but broadly they fell into three types: those compatible with the Kempston joystick interface, those that simulate the pressing of the cursor keys, and those compatible with the Sinclair Interface 2 (the two port joystick and cartridge interface released by Sinclair a few years after the original launch of the ZX Spectrum). Games usually support one or more of these joystick interfaces.

The Game settings menu allows you to specify the interface type through which you want your joystick or game controller to be connected to the game, so you should choose one that the game supports and select it in the game also. Note that the Kempston was the first interface produced for the ZX Spectrum and so is the most widely supported and may work by default at the same time as using the keyboard.

**Joystick type**

Kempston

Cursor

Sinclair IF2

## ***Mapping the controls***

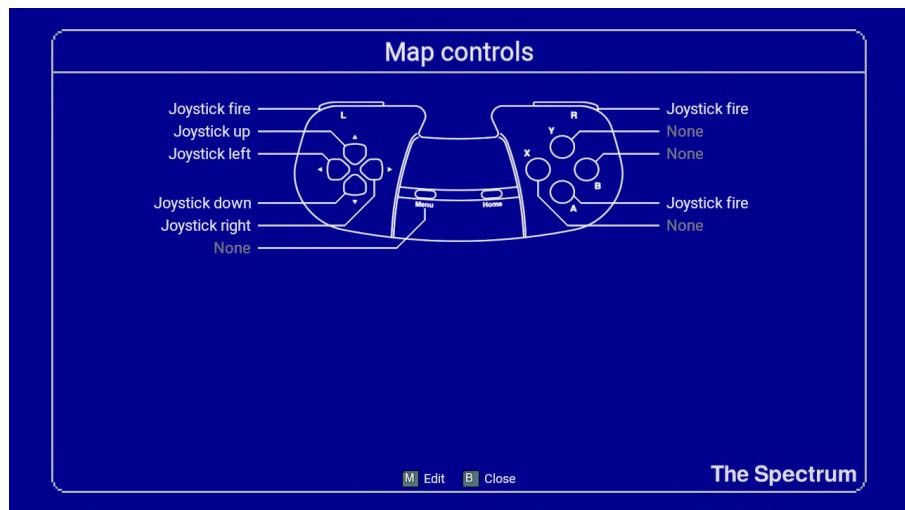
If you wish to use a gamepad or joystick when playing a game you own, you can map each direction and button of the physical controller to either a keyboard key or traditional ZX Spectrum joystick function.

For example, if you are using a gamepad and configure the **Player 1 joystick** to set the D-Pad to be that of joystick-up, down, left and right, and set the **Joystick type** to be **Kempston**, then when the D-Pad is pressed, the game will see those directions as coming from Kempston joystick. Equally, you could configure the directions of a gamepad D-Pad to be the keys **Q**, **A**, **O** and **P**, such that when the D-Pad is pressed it will appear to the running game as though those keys were being pressed.

The eleven most common gamepad buttons can be configured to Spectrum joystick or keyboard actions. The **HOME** or Start button is reserved.

The Spectrum allows two player joysticks to be configured, but note that if the second joystick is configured with directions being joystick up, down, left, right and fire then these inputs will only work when the **Joystick type** is set to **Sinclair IF 2**, since this is the only ZX Spectrum interface that supported two simultaneous joysticks. You can however configure the **Player 2 joystick** to press keyboard keys for each of the directions and other buttons, allowing 2-player games that do not support the **Sinclair IF 2** interface to be played with two controllers which act as a real joystick and keyboard.

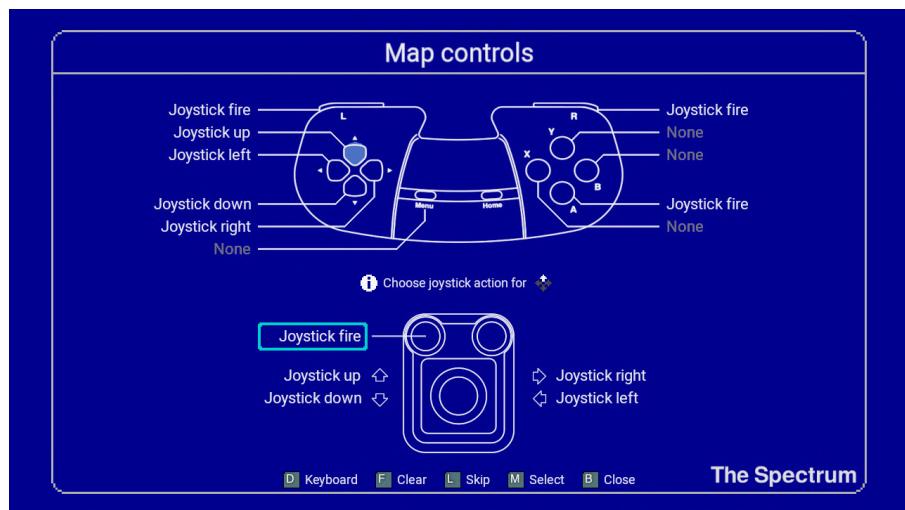
The controller mapping for the game can be viewed and edited by selecting the Map controls option. This will show a diagram of a game controller and label each button with the current assigned action.



To edit the actions assigned to gamepad directions and buttons, press **M**.

## ***Configuring games that use joysticks***

### **Assigning joystick actions**



While editing, The Spectrum positions a light blue indicator over gamepad button currently being assigned. For this button:

- To change the assigned action, use the **O**, **P**, **Q** and **A** to select the joystick action you want to assign and press **M**
- To keep the assigned action, press **L**
- To clear the assigned action and leave it unassigned, press **F**
- To make a selection from a different action group, press **D**

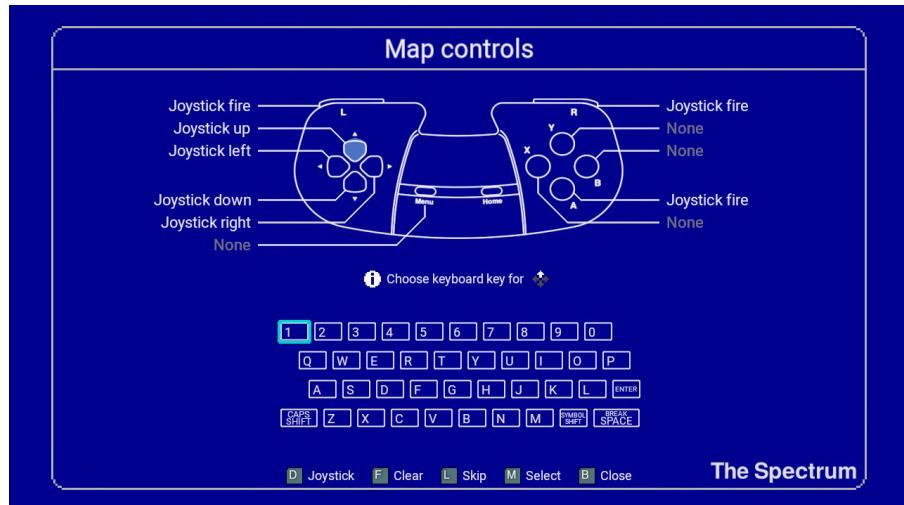
Once an assignment is made, cleared or skipped, The Spectrum will move the blue indicator to the next button, where you repeat the process until all buttons have been assigned, cleared, or skipped.

While assigning joystick actions, pressing **D** will switch to the group of Keyboard actions.

### Assigning keyboard actions

Assigning keyboard actions to a gamepad follows the same process as assigning joystick actions. The Spectrum will display a representation of The Spectrum keyboard and allow keys to be assigned to gamepad buttons.

**Note:** You can only assign a single key to a stick button.



Press **D** to switch back to the group of Joystick actions.



# CHAPTER 9

## Cassette tape navigation

Programs are stored on a ZX Spectrum cassette tape in chunks, with the first chunk in a sequence being a program which, when loaded, takes responsibility for loading any remaining data chunks. Commercial programs more often than not contain just a single multi-block program per cassette tape, but some can contain more than one.

The Spectrum contains a tape navigation user interface which acts like a virtual cassette machine, allowing you to pause and start the playback or forward and rewind to different points in the cassette tape file.



The tape navigation is activated by pressing **HOME + A**.

The tape position indicator shown on the right hand side of the screen shows the current play position, which has a slightly different meaning depending on the type of cassette tape file being used:

- 1) TZX and PZX cassette tape files usually have navigate-point markers at the start of each sequence of blocks that make up a complete program. The cassette tape navigation will allow you to move forwards and backwards between these navigation points, and therefore the starting points of each loadable program. The tape position indicates which program the playback is currently within, along with the percentage of the program has been loaded so far:

**current program . percentage-complete / total number of programs**

TZX and PZX cassette tape files load in real time (which can be accelerated) so the tape navigation will show the percentage-complete increasing as loading proceeds. For example, the screenshot shown at the start of this chapter shows Manic Miner loading, with the tape navigation indicating that it is 72% of the way through the first program, from a total of one program.

A vast majority of cassette tape files only contain a single program, even if it is multi-chunk, so the tape navigation will show the total number of programs as one.

- 2) TAP cassette tape files differ from TZX and PZX files in that they do not contain navigate-points, so there is no way to navigate from the start of one program to the start of another. Instead, TAP file navigation is done at the block level, where blocks usually come in pairs, with the first block describing the contents of the second. The tape position indicates which block the playback is currently within, along with a percentage showing how much of a block has been loaded, followed by the total number of blocks in the cassette tape file:

**current tape block . percentage-complete / total number of blocks**

The blocks in a TAP file will load almost instantaneously, so the percentage complete indication for a block will usually be at zero, indicating that the playback position is at the start of the block. The exception is where the tape position has reached the very end of the TAP cassette file, in which case the percentage will show 99% indicating the end of the last block.

Some multi-load games will require you to start and stop the cassette tape when prompted, or rewind back to the beginning. It would be unusual for a program to request that the user rewinds or forwards to a specific point on the cassette.

Usually the tape playback position will not increase unless a program is actively trying to load data from the cassette tape file, so you may not need to stop and start the cassette tape file playback through the navigation controls.

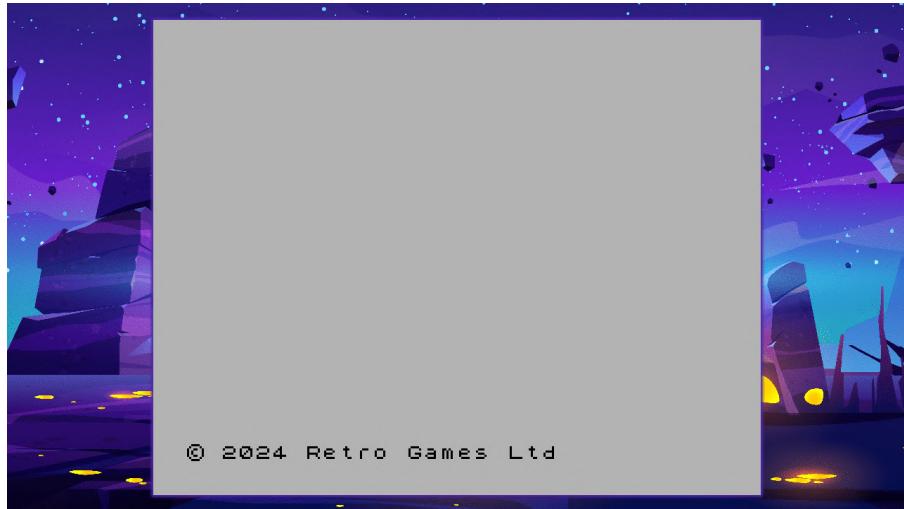
# CHAPTER 10

## Classic mode

One of the exciting and possibly initially intimidating things about the ZX Spectrum was being presented with a BASIC programming prompt when it was switched on.

This was a time before graphical user interfaces and all home computers of that period offered a similar experience, one where the user had to learn at least one programming command to be able to load a program from cassette tape. Indeed, the expectation that the user intended to write programs and have the ZX Spectrum do work for them was so high, that the main user manual was entirely given over to teaching the user the BASIC programming language.

The new The Spectrum has a modern carousel based user interface from which you can easily launch one of the 48 included games and interact with its many features, but it also faithfully recreates the original ZX Spectrum experience with its **Classic mode**.

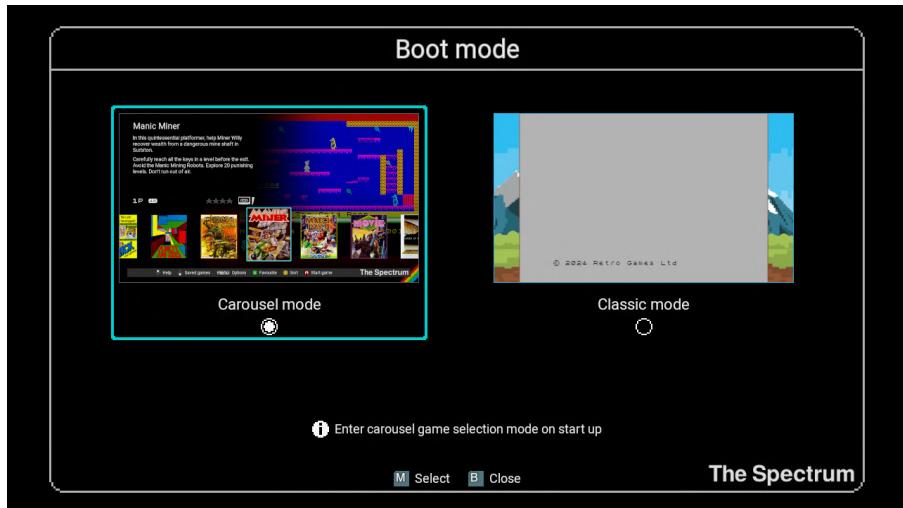


Classic mode presents you with a copyright message, appropriately updated, before presenting you with the familiar keyword cursor at the press of a key.

## Switching to Classic mode

Classic mode can be entered on demand from the carousel by selecting *Options* → *Advanced options* → *Switch to classic mode*.

Alternatively you can choose to have The Spectrum enter Classic mode every time you turn the power on by changing the **Boot mode**, a configuration screen entered by selecting *Options* → *Advanced options* → *Boot mode* from the game carousel.



Changes made to the **Boot mode** configuration take effect the next time you power on The Spectrum.

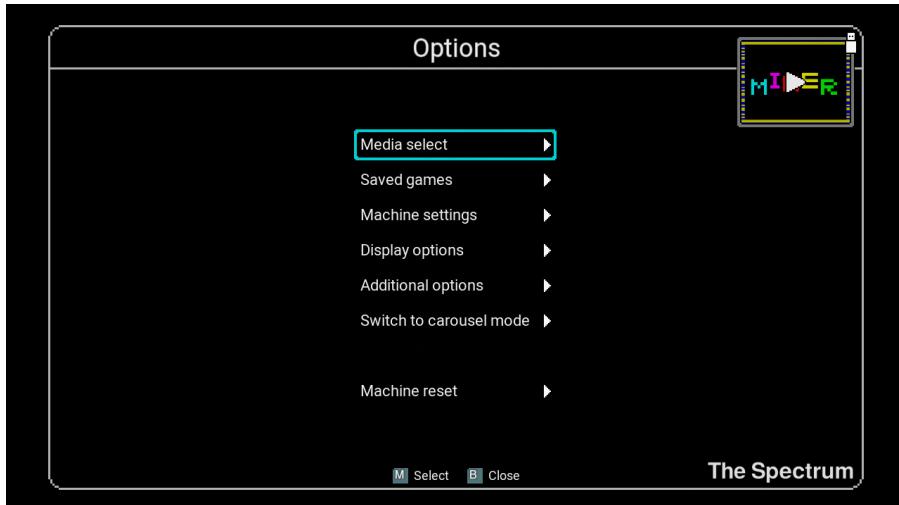
To change the boot mode while in **Classic mode**, access the **Boot mode** item from the Classic mode options menu (see **Classic mode options**).

## Choosing a ZX Spectrum model

The Spectrum supports both 48K and 128K models of the ZX Spectrum. On entering Classic mode The Spectrum will default to the original 48K model, and this can be changed by selecting **Default machine settings** from the options menu. See Default machine settings for further information.

## Classic mode options

When in Classic mode The Spectrum options and features are entered by pressing the **HOME** button. This will temporarily suspend what you are doing and display the classic mode options menu, along with a miniaturised view of the suspended activity shown floating at the top-right of the screen.



Pressing key **B** when viewing the Classic mode options will close the menu and return you to your suspended session.

## Media Access

Selecting the Media Access will launch a file browser that you can use to navigate through and load your own program files from a USB stick.

See **Chapter 7 - Loading your own programs** for full instructions.

There are a few differences between accessing media on a USB stick in Carousel mode and in Classic mode:

- In Carousel mode, programs can only be auto-loaded from a USB stick. In Classic mode you are able to eject and insert cassette tape files at will (without auto-loading them) and then return to your suspended session with the new tape attached.
- Any **Game Settings** configured for a program are applied only for **auto-loaded** cassette tape files. In Classic mode, when a cassette tape is inserted and the suspended session is resumed without auto-loading, then the game settings are not applied.

Thus in Classic mode you are able to freely swap cassette tape files as needed, either because a game prompts you to do so or because you want to save a program to a particular cassette file, and so on.

**Warning:** Auto-launching a program from a tape file will abandon what you are currently doing with The Spectrum and replace it with the program that was selected.

Saving programs and data requires a writable cassette tape file and The Spectrum takes some special steps to allow information to be saved while a non-writable cassette tape file is attached. Therefore saving programs and data as cassette files on a USB stick has some considerations, which are explained fully in **Chapter 11 - Saving programs and data**.

## ***Saved games***

Selecting **Saved games** gives access to four save game slots per attached tape file. This means that when you attach a different cassette tape file, the four save game slots will change to be those for the attached tape file.

Therefore to resume a game that you previously saved into a save game slot, you first have to attach the cassette tape file containing the game, and then resume the game from the save game slot.

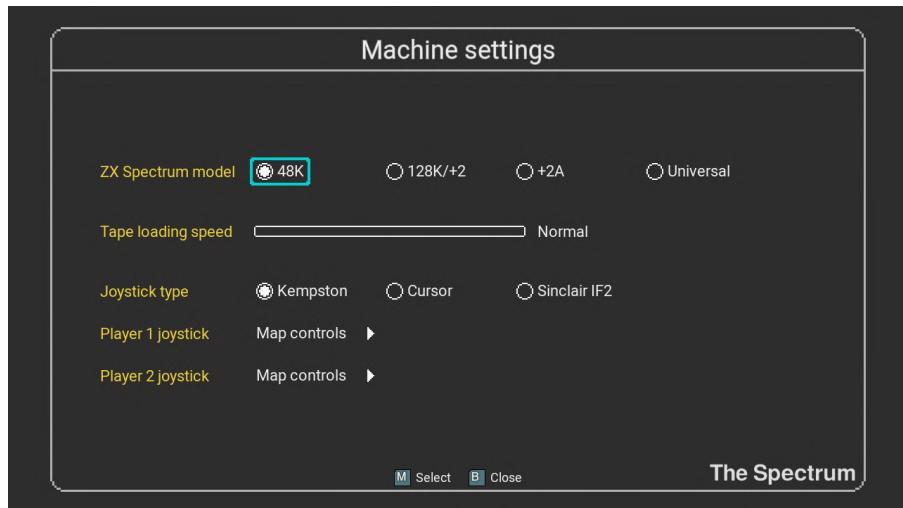
If you are using a multi-tape program, then switching to the second or third cassette tape will change which save game slots are shown. Should you need the same four save game slots to be shown for all files that make up the multi-tape game, set up a playlist containing the multiple tape files.

## ***Default machine settings***

These settings are similar to those used to configure individual programs on a USB stick as described in **Chapter 8 - Adjusting the settings of a program**, but instead configure how The Spectrum operates when in Classic mode.

Any changes to the ZX Spectrum model take effect only when you reset the running Spectrum session by selecting **Reset machine** from the options menu.

When auto-launching a cassette tape file from **Media access**, if you have configured individual game settings for that file then those settings will override the default **Machine settings** while that file runs. Once you reset The Spectrum classic mode session, the configured default **Machine settings** will take effect once again.



## ***Display options***

This menu item gives you access to the global display settings, as described in **Chapter 6 - Options and settings**. Here you can change how The Spectrum display appears, which attractive frame to use, how much of the Spectrum border to show and whether extended colours are available.

## ***Additional options***

The Additional options menu item gives access to the remaining options and settings available in carousel mode, that are infrequently used when in classic mode:

- Language
- System options
- System information
- Boot mode
- Shutdown machine
- Legal information
- Factory reset

These options are described fully in **Chapter 6 - Options and settings**.

## ***Switch to Carousel mode***

Selecting this option will abandon the current Classic mode session and present you with the games carousel from which you can select and play one of the built in games.

## ***Reset machine***

This option will end the current The Spectrum classic mode session and start a new one using the ZX Spectrum model set in Default machine settings. In doing so it wipes the ZX Spectrum memory and ends the current cassette tape saving sequence and finishes writing to the current cassette tape file.

## ***Using custom operating system ROMS***

Each of the original ZX Spectrum models had its own version of the Sinclair ZX Spectrum operating system permanently stored within it on a Read Only Memory (ROM) chip. The Spectrum is similar and has its own compatible version of the operating system which is sufficient for most uses, but does lack a few specialist features found in particular on later models of the ZX Spectrum.

Should you require the use of these additional features and you own the original ZX Spectrum ROM chips, you can put the appropriate ROM image files on a USB stick for The Spectrum to use instead of its own operating system.

The ROM image files must be stored in the folder `/THESPECTRUM/roms/` on your USB stick. The following table gives the filenames The Spectrum expects the operating system ROM image files to use for each of the ZX Spectrum models:

<i>Machine model</i>	<i>ROM filename</i>	<i>Description</i>
16K / 48K	48.rom	A single 16K ROM file.
128K Universal	128-0.rom 128-1.rom	The 128K and universal models use two 16K ROMs for a total of 32K of ROM.
+2A	plus3-0.rom plus3-1.rom plus3-2.rom plus3-3.rom	The +2A model uses four 16K ROMs for a total of 64K of ROM.

# CHAPTER 11

## Saving programs and data

The details presented in this chapter apply to firmware version 1.0.1 and above, see [Updating the firmware](#).

Much like the original ZX Spectrum, which allowed you to record programs onto magnetic cassette tape so they could be loaded back again later, The Spectrum allows you to do the same onto virtual cassette tape stored on a USB stick.

A virtual cassette tape is maintained as a writable .tap file on a USB stick. The Spectrum will create a .tap file if it doesn't exist, and automatically create new files as required, depending on what is being saved and in what sequence.

Saving normally happens in parallel to any tape files you have attached in Media Access for loading. This way you can attach and load a game that is able to save game data, and have that data automatically written onto a separate tape file at the appropriate time. This avoids switching media frequently and allows you to save at any time, particularly when you weren't aware that you would need to do so.

For example, with a USB stick inserted into The Spectrum, switch to Classic Mode and run the following:

**10 PRINT “Test”**

Then save this simple program to USB stick with

**SAVE “test”**

If you have **ZX Spectrum border size** in Display options set to one or greater, you will briefly see the border flashing with horizontal lines as the save proceeds.

**Note:** Saving takes much less time than on an original ZX Spectrum and the brief border flash is a short visual confirmation that a save is occurring.

If you press the **HOME** button to enter the **Options** menu and select **Media select**, you will see the file **test\_WR** listed along with a **TAP** file icon. The **\_WR** filename postfix allows The Spectrum to identify that the file is writable, and is present in every .tap The Spectrum creates during saving.

To load saved information back at a later date, the tape file that has been written to must be attached in **Media select**. For example, attach the file `test_WR` created above, return to The Spectrum BASIC prompt, and run the following:

```
NEW  
LOAD ""
```

Once The Spectrum has reset and you have entered the **LOAD** command, you will see The Spectrum display the following text

**Program: test**

and the usual 0 OK, 0:1 completion message at the bottom of the screen. Typing **LIST** will show the program you previously saved:

```
10 PRINT "Test"
```

The saving of BASIC programs is often followed by the saving of arrays and bytes. For example:

```
DIM b(2,3)  
SAVE "array" DATA b()
```

The contents of the data array b array will be saved to USB stick by being appended to the end of the writable tape file currently in use, which in this case is the file created by saving the BASIC program. This behaviour supports the common use case of having a BASIC program first on a tape, followed by all the data it needs stored sequentially as separate files on the same cassette tape.

In general, saving a BASIC program will define the `.TAP` filename used for subsequent **SAVE** commands.

To illustrate this dynamic naming of files on USB stick, press **HOME** and enter **Media select**. Now **eject** the currently attached tape file by pressing **F**, and then return to The Spectrum BASIC.

Save the test program again using the same filename as before:

```
SAVE "test"
```

Confirm that this has been written to USB stick by pressing **HOME** and entering **Media select**. You will see the file `test_WR` listed as before, in addition to a new file named `test-1_WR`.

Whenever you save a BASIC program The Spectrum will write to a new file on the USB stick based on the name you give to the **SAVE** command. If that filename already exists, it will add an incremental suffix to guarantee uniqueness. This new file will be used for subsequent saves until the next BASIC program is saved (or another action overrides the save filename, discussed later in this chapter).

There are cases where data arrays and bytes are saved without having first saved a BASIC program to cassette tape. This may be because a game has saved some high-score data, or perhaps you are using a database program and have saved the new contact details you have entered. In these scenarios The Spectrum applies some additional strategies to determine which filename to write to the USB stick.

If you have an attached tape file that is not writable (in other words it does not have a `_WR` suffix) then The Spectrum will use that tape filename as a basis for any files it creates during saving if it has first not saved a BASIC program.

For example, imagine having the tape file `my-game.tap` attached through **Media select**, and then some data saved as follows

**SAVE “scr” CODE 16384,6912**

Since no BASIC program has yet been saved, The Spectrum will instead use the filename of the attached tape file, appending to it the `_WR` suffix and saving the data to the resulting file named `my-game_WR.tap`.

This means that saved data will be written to a cassette tape file named after the program that is attached and running, so that it relates to that program and is easy to find. The same dynamic indexing of filenames will be applied, such that if `my-game_WR.tap` already exists from a previous save then `my-game-1_WR.tap` will be created instead, and so on.

The filename `my-game_WR.tap` will continue to be used for saving until a BASIC program is saved or the attached tape file is ejected or exchanged.

There is a small corner case where data may be saved without first saving a BASIC program or attaching a tape file though **Media select**. In this situation The Spectrum falls back to a default filename of `TheSpectrum_WR.tap`, again with an incremental suffix when that filename already exists.

You can see this in action if you eject any tape that is attached in **Media select** and choose **Reset the machine** to clear The Spectrum's memory. Then save some data before saving anything else:

**SAVE “scr” CODE 16384,6912**

By examining the file list in **Media select** you will see that the **SAVE** command created the file `TheSpectrum_WR.tap`.

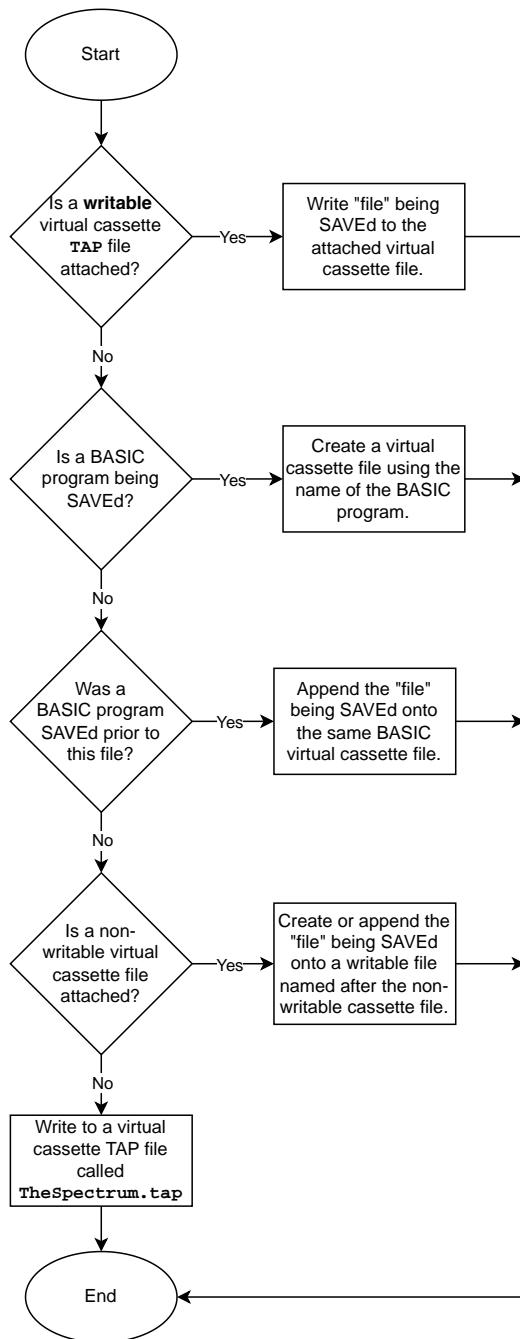
There is one filename rule that overrides everything else, and that is if you have attached a writable cassette file (one with a `_WR` filename suffix) then **all SAVE** operations will be written to that cassette file. Thus if you want to explicitly control which writable cassette tape file The Spectrum writes to, you must attach it.

You can do this by dipping in and out of **Media select** as needed, or by adding the writable cassette tape file to a playlist along with any other tape files you need, and use media swapping to exchange them.

If The Spectrum detects an error which prevents it from saving to the USB stick, for example the USB stick being removed, then it will temporarily set the ZX Spectrum border to red.

**Note:** Programs which have custom save routines and do not use The Spectrum operating system routines to save data will not have that data captured and stored on a USB stick.

The cassette tape file naming rules used by The Spectrum to decide which tape file to write information are described by the flowchart.





# CHAPTER 12

## Using the virtual keyboard

While playing a game with a game controller pressing **(Home)** + **(Menu)** will bring up a virtual keyboard on the right hand side of the screen. This allows you to virtually press any of the standard ZX Spectrum keyboard keys. While the virtual keyboard is in operation the game will not respond to The Spectrum keyboard or game controller. This is most useful for entering your name in a high score table if you are using a game controller and the keyboard is out of reach.

Move the selector over a key you wish to virtually press and press **(A)**. There are also some special shortcut functions you can quickly access through a controller:



---

<i>Joystick button</i>	<i>Virtual keyboard key</i>
<b>(B)</b>	RETURN
<b>(Y)</b>	SPACEBAR

---

To close the virtual keyboard and resume game play with controller, press **(Home)** + **(Menu)** again.

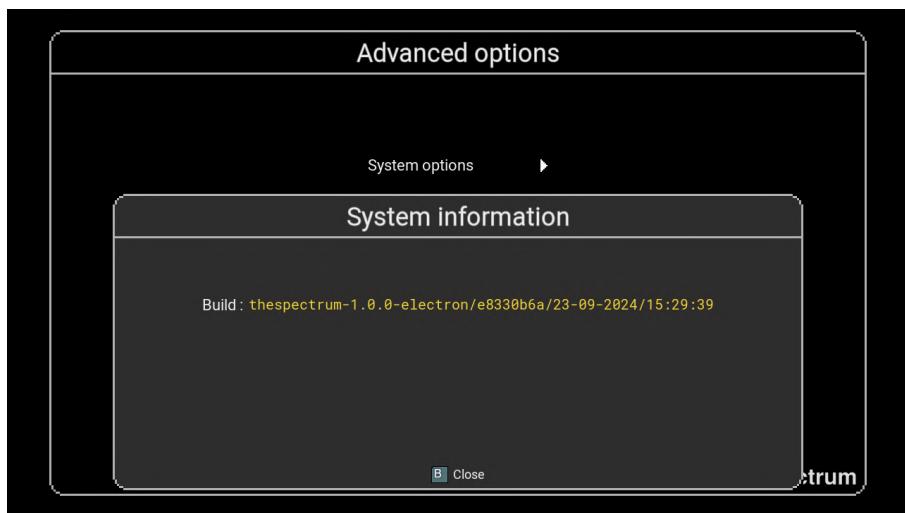


# CHAPTER 13

## Updating the firmware

Retro Games may occasionally release new firmware versions for The Spectrum to correct issues, add new features or games.

Entering the menu *Options* → *Advanced options* → *System information* will show the current *Build* version of the firmware.



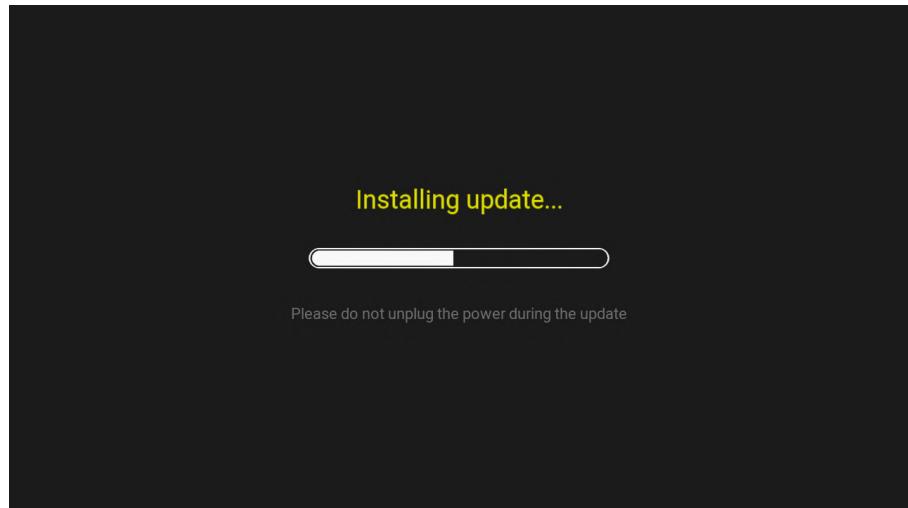
### To update the firmware

- 1) Visit [retrogames.biz/links/upgrade/thespectrum](http://retrogames.biz/links/upgrade/thespectrum) and check if the latest version on the website is greater than that reported by The Spectrum.
- 2) If a later firmware is available, download it.
- 3) Copy the firmware onto the root folder of a FAT32 MBR formatted USB stick. Do not place it in a folder.
- 4) Insert the USB stick into your The Spectrum.
- 5) Go to *Options* → *Advanced options* → *System information*.
- 6) The Spectrum will check if there is a newer firmware on the USB stick and, if so, give you the options to Update or Cancel.
- 7) Selecting Update will begin the installation process.



While installing, The Spectrum will display a progress bar which will fill up from left to right as the update proceeds.

**Note:** It is important not to remove the USB stick or power from The Spectrum while the update is in process.



When the update is complete, The Spectrum will reboot and return you to the game carousel. If you wish to verify that the update has been applied, go to *Options* → *Advanced options* → *System information* and check the Build version that is displayed.

# CHAPTER 14

## Using your own peripherals

### ***Using third-party controllers***

While The Spectrum has been designed to work best with its keyboard, it is also compatible with Retro Games' THEGAMEPAD and THEJOYSTICK as well as some third-party controllers and joysticks.

The button designations of most USB controllers follow one of the three conventions established by Microsoft (Xbox), Sony (Playstation) and Nintendo. The following table shows how the buttons of these, THEJOYSTICK, THEGAMEPAD and THECXSTICK compare.

Xbox	Playstation	Nintendo	THEJOYSTICK	THEGAMEPAD	THECXSTICK
A	X	B	Left Fire	(A)	F
B	O	A	Right Fire	(B)	TOP
X	□	Y	◀ ▶	(X)	○
Y	△	X	▽ ▲	(Y)	○
LB	L1	L	●○○○	(L)	○
RB	R1	R	○●○○	(R)	S
Back	SELECT	SELECT	○○●○	Menu	Menu
Start	START	START	○○○●	Home	Home

If you have two controllers connected to The Spectrum and start a game using a controller, then that controller will be assigned to the joystick port, usually acting as player-1. The other controller will function as the player-2 joystick, if supported by the game and configured correctly (see [Mapping the controls](#)).

However, if you start the game with the keyboard, The Spectrum will assign the controllers to player-1 and player-2 in the order they were detected. Therefore, if you use two controllers and start a game with the keyboard, you may have to try both to find the controller that is player-1.

### ***Using a USB keyboard***

If you plug any standard USB keyboard into one of The Spectrum's USB ports, that keyboard will function much like the built-in keyboard, with the SHIFT key acting as **CAPS SHIFT** and CTRL acting as **SYMBOL SHIFT**.

# CHAPTER 15

## Troubleshooting

### ***Additional support***

Additional support and the answers to frequently asked questions can be found on the official website at [retrogames.biz/links/support/thespectrum](http://retrogames.biz/links/support/thespectrum).



### ***Power indicator does not light***

To turn on The Spectrum, press the power button once. If after a few seconds the power indicator does not light and you see nothing on the TV, check that you are using a suitable 5V/1A (5W) USB power adapter, and that the power adapter is working. Unplug any controllers or USB sticks that you have attached to The Spectrum. Also check the power cable and test by exchanging it for a known working cable.

### ***Blank screen seen on the TV***

If The Spectrum power indicator is lit but the TV shows no picture, check the HDMI cable is correctly connected at both ends, and if necessary try a different cable that is known to be working. Also it may be that The Spectrum is using a video output mode that your TV does not support. See I have chosen a video output mode that is not supported by my TV.

### ***No sound heard from my DVI monitor***

The Spectrum is not designed to be used with a DVI monitor nor is it supported when done so. The Spectrum may appear to be compatible with DVI monitors through an HDMI-to-DVI converter, but the DVI standard does not support audio, so even if you see a picture you will hear no sound. It may be possible to use a converter that is capable of feeding audio separately, but this is done at the user's own risk.

### ***I have chosen a video mode that is not supported by my TV***

If you have accidentally chosen an output mode in Television settings that your TV cannot display, or are now using a TV that doesn't support that mode, you will have to perform a factory reset to change the output mode. This can be done in two ways:

- 1) Plug The Spectrum into a TV that does support the current output mode and then navigate to *Options* → *Advanced settings* → *Factory reset* (See **Factory reset**).

Or,

- 3) Force a factory reset. If turned on, turn The Spectrum off by pressing and holding the power button for approximately two seconds (until the power indicator goes out). Wait 10 seconds. Perform the factory reset by pressing and holding the power button until the welcome logo appears.

Once the factory reset is complete, you will then be guided through the initial setup sequence which includes choosing an output mode supported by the TV (See **First-time setup**).

**Note:** Forcing a factory reset will delete your Saved games and settings.

### ***The TV picture appears to lag behind the game action***

HD TVs usually employ digital processing of the incoming TV picture. Aware of how this affects video games, they usually provide a setting to enable a “gaming mode” (or a similarly named feature). Ensure that you enable this setting in your TV for the HDMI input channel you are using for The Spectrum.

### ***USB stick is not recognised***

The Spectrum will only recognise USB sticks that are formatted with the FAT32 filesystem with a Master Boot Record (MBR). This is a standard format that can be created with all operating systems.

### ***The Spectrum gets warm***

This is normal. The Spectrum contains a powerful processor that works very hard to recreate the authentic gaming experience of the original ZX Spectrum computer, and in doing so it generates a little heat. The Spectrum radiates heat from the top rear surface of the case for this reason, and it is important not to cover this surface. The Spectrum should be moved away from other sources of heat and ensure that there is plenty of airflow around the case.

### ***The program I have is not working***

We cannot give help for third-party programs. Please reach out to the many community support forums and facebook groups for help.

# CHAPTER 16

## Precautions

### ***Seizures***

A very small number of people may experience seizures or blackouts triggered by flashes of light or particular patterns of colour. This may happen even if they have never had a seizure before. Video games, some of which employ effects such as colour-cycling or screen-flashing, may trigger these symptoms.

- Anyone who has had a seizure, blackout, loss of awareness or any symptom related to an epileptic condition should consult a doctor before using The Spectrum.
- Stop using The Spectrum immediately and consult a doctor if you or anyone using or viewing The Spectrum experiences dizziness, eye or muscle twitches, disorientation, affected vision, involuntary movements, convulsions or seizures. Only resume after consulting with a doctor.

To reduce the chances of a seizure while using The Spectrum:

- Use The Spectrum in a well-lit area.
- Ensure the monitor or TV screen does not take up a large portion of your field of vision, by keeping a sensible distance away from the screen and/or using a small screen.
- Do not use The Spectrum if you are tired or need sleep.
- Take a 15 minute break every hour, even if you don't think you need it.

### ***Repetitive motion injuries***

To reduce the chance of injury due to repetitive motion:

- Avoid excessive play.
- Take a 15 minute break every hour, even if you don't think you need it.
- If your hands, wrists or arms become sore while playing, or if you experience tingling, numbness, burning or stiffness, stop immediately and rest for several hours before playing again.
- If you continue to experience any of the above symptoms during or after using The Spectrum, consult a doctor.

## ***Eyestrain and motion sickness***

Continuous play can cause your eyes to hurt, and some games may cause some players to experience motion sickness. If you or anyone using or viewing The Spectrum experience these symptoms, stop immediately and rest. Do not drive or engage in any other demanding activity until the symptoms subside.

To reduce the chances of these symptoms:

- Take a 15 minute break every hour, even if you don't think you need it.
- If you are prone to motion sickness, try to identify which games include the kinds of motion that trigger these symptoms, and avoid them.

## ***Electric shock***

To avoid electric shock when you use The Spectrum :

- Do not expose The Spectrum to liquids, high temperatures, high humidity, steam, direct sunlight, excessive dust or smoke.
- Do not allow small particles or any foreign objects to get inside The Spectrum.
- Do not touch The Spectrum or any connected cables during an electrical storm.
- Do not touch any of the metal parts of the connectors on The Spectrum.
- Do not use any power cables, HDMI cables or peripherals if they are split, frayed or otherwise damaged.

## ***Ventilation***

To avoid The Spectrum overheating in use:

- Place on a flat, even surface.
- Do not place it on a rug or carpet with long fibres.
- Allow plenty of airflow through the grilles on the top and bottom of the case.
- Do not allow dust to build up on the grilles.
- Do not cover The Spectrum or use it in an enclosed cabinet or other location where heat may build up.
- Do not place in a narrow or cramped space.

## ***Handling and use***

- Only connect the following devices to the USB ports: keyboards, mice, controllers, memory sticks, powered hubs, keyboards.
- Ensure that the power adapter can supply sufficient power for The Spectrum and connected devices.
- Make sure all cables are connected only to the correct ports, and make sure to hold plugs straight when inserting.
- Keep The Spectrum and all cables and peripherals out of the reach of young children.
- Do not position The Spectrum where it or any connected cables might cause someone to trip or stumble.
- Do not drop, hit or otherwise abuse The Spectrum or any cables or peripherals.
- Some gameplay and game features may be different from when originally played on an original ZX Spectrum.
- Do not power off The Spectrum whilst data is being loaded or saved.

**Retro Games LTD**

Unit 166, The Mall  
Luton, LU1 2TL  
England