ZX Touch

ZX Spectrum handheld console

v1.13

User manual

Contents

1. Introduction

ZX Touch is a modern handheld console built around the ZX Spectrum, one of the most influential home computers of the 1980s. Decades later, the platform continues to inspire a passionate global community of enthusiasts, collectors and developers who still create new games and software for it today. Whether you grew up with a ZX Spectrum or are discovering it for the first time, ZX Touch offers an authentic and accessible way to explore a unique piece of computing history that remains very much alive.

At its core, ZX Touch is a faithful emulator. The 7-inch IPS touchscreen runs at a native 50 Hz refresh rate, perfectly matched to original ZX Spectrum timing, so every frame, every colour flash and every scroll behaves exactly as it did on real hardware. The tactile D-pad buttons provide a soft but precise feel, making ZX Touch well suited to fast-paced arcade games and precise platformers. For text adventures and BASIC programming, a full-layout on-screen keyboard is available. The included stand props the console at a comfortable reading angle, making longer typing sessions genuinely pleasant.

The ZX Touch FX System is something you have probably never seen in an emulator before. This real-time visual enhancement layer operates entirely on top of the emulator, without modifying the original game or its ROM in any way. Through custom colour palettes, edge shading, transparency and hand-crafted background artwork, FX can transform the appearance of a classic game so dramatically that it resembles a modern remake. Crucially, the effects are scene-aware, shifting and adapting as the game progresses, responding to what is actually happening on screen. This transformation is packaged into a ZTG file, a self-contained bundle that combines the game with its full FX configuration. When a prepared ZTG file is launched, the magic happens automatically. Flat backgrounds give way to rich illustrated scenes, objects gain depth and definition, and the overall image takes on a quality the original hardware was never capable of producing.

Beyond emulation and visuals, ZX Touch is a complete platform. A customisable Games Library, WiFi connectivity with wireless file management, a tape player, game rewind, snapshot tools and configurable RGB side lights all come built in. Every setting can be saved per individual game and bundled into a ZTG file, ready to share with other users.

ZX Touch is both a tribute and an evolution. It preserves everything that made the ZX Spectrum worth preserving, and extends it with capabilities that no original hardware ever had. The chapters that follow will guide you through everything it can do.

2. Hardware description:

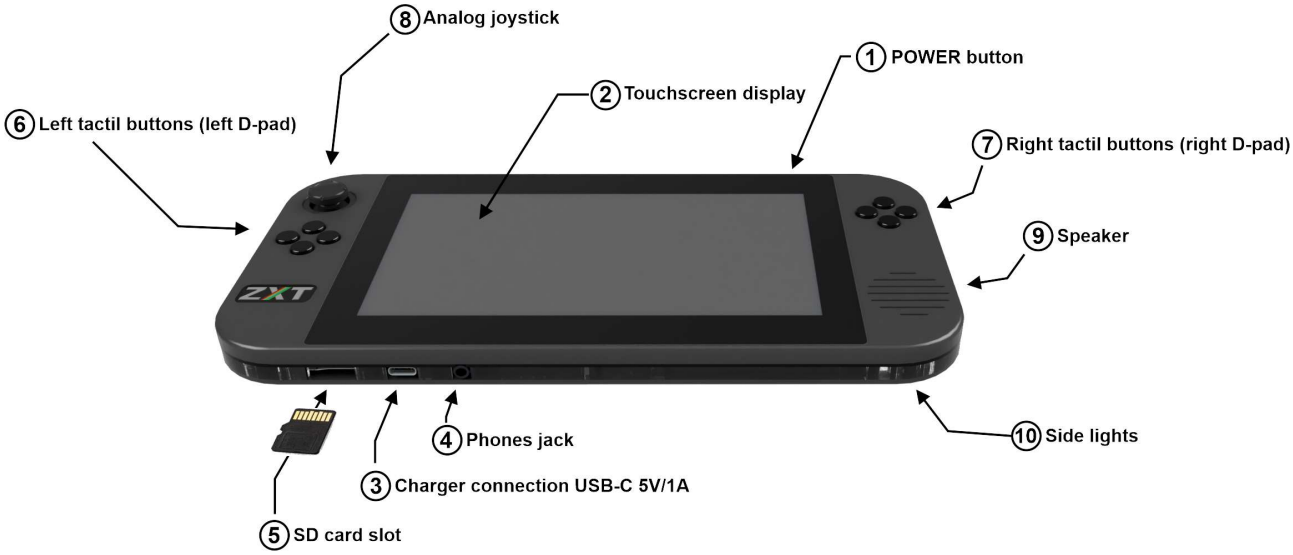

Figure 1.

1. POWER button

One short press of this button turns on the ZX Touch (ZXT) console. If you hold this button for 3s while the console is running console will turn off.

2. Touchscreen display

The ZXT features a 7-inch LCD IPS display with a high resolution of 1024x600. The refresh rate of the display is 50Hz, perfectly synchronised with ZX Spectrum emulation. The IPS technology delivers a strikingly vivid picture with a wide viewing angle. Beneath the glass, there is a capacitive multitouch screen that offers an intuitive user interface and a full keyboard profile of the ZX Spectrum.

3. Battery charger connection

The ZXT device does not come with an AC/DC adapter for charging its battery. However, it is equipped with a wide spread USB-C port that enables the use of any AC adapter featuring a USB-A output, paired with a cable equipped with a USB-C connector at the opposite end.
Through the transparent edge of the console, two LED lights can be seen on the left and right side of the charging connector. The green LED is lit if the charger is connected, and the red is lit when the battery is charging. If the green light is on and the red one is off, it means that the battery is fully charged.
The ZXT features a built-in 3000mAh rechargeable LiPo battery that provides 4-6 hours of playtime, depending on the screen backlight and sidelight settings. Charging time for the battery is approximately 3 hours when using fast mode (1A), and 6 hours when using slow mode (0.5A).
The ZXT will automatically select the charging mode based on the type of charger and battery condition.

NOTE: The length of the USB-C cable must not exceed 3 meters.

4. Headphone jack

The console features a 3.5mm headphone jack located on the lower side. Once headphones are plugged in, the built-in speaker will automatically turn off.
Additionally, the ZXT can be connected to an external portable or fixed loudspeaker with an amplifier using this connection.

5. Micro SD card slot

The ZXT comes with a micro SD memory card slot that supports cards of any capacity formatted using either the FAT32 or exFAT file system. Please note that the FUT (Firmware Update Tool) application currently supports only FAT32 formatted SD cards for firmware updates.
Please take note of the insertion direction, which is indicated in Figure 1. The contacts on the card should be inserted into the slot first and oriented so that they face the same direction as the front side of the console, where the screen is located.
The micro SD card has multiple functions. It primarily serves as a storage location for games that can be loaded onto the ZXT and played. In addition, the SD card is used by the ZXT to store game positions and configurations for individual games. Alternate ROMs can also be stored on the SD memory card.

6. & 7. Tactile buttons

The console features eight physical buttons that are grouped in a diamond shape, with four buttons on each side forming the left and the right d-pads. These buttons have been thoughtfully selected to provide a soft touch while also ensuring a clear tactile sensation. They are manufactured by Omron type B3F and are considered some of the best quality keys available in the market for their size. Each d-pad is made on a separate PCB and connected to the main PCB with four screws, allowing for easy replacement in case they wear out.

8. Analogue joystick

On the left side of the console is an analogue joystick that can be assigned to any key on the ZX Spectrum keyboard or to the direction of previously popular joysticks. This analogue joystick is the same as one on the Nintendo Switch console and in case of wear, the user can replace it with a spare one using only a Philips type screwdriver.

9. Built in speaker

ZX Touch produces sound using a built-in 28mm 1.5W speaker on the right side, powered by a class D amplifier. AY sound is typically generated in hardware by mixing three square-wave oscillators and a noise generator, with minimal software involvement to maintain authentic ZX Spectrum audio quality. Additionally, a software emulation mode for AY sound is available, enhancing bass tones and improving sound quality for headphone or external speaker use.

10. Side lights

The case is made of several layers. One of the layers is made of a transparent acrylic sheet cut on a laser cutter. RGB LEDs are placed in the four corners of the console, which lights are transmitted around through this transparent layer. ZXT has several modes for controlling this light.

3. Software description:

The ZXT user interface adopts a familiar approach inspired by smartphones and tablets. Whether you wish to initiate a game or modify settings, the touch screen serves as the primary input method. Tactile switches and a joystick are exclusively employed for gaming purposes and basic navigation.

Upon powering on the console, the title screen briefly displays for a few seconds, followed by the screen depicted in the image below:

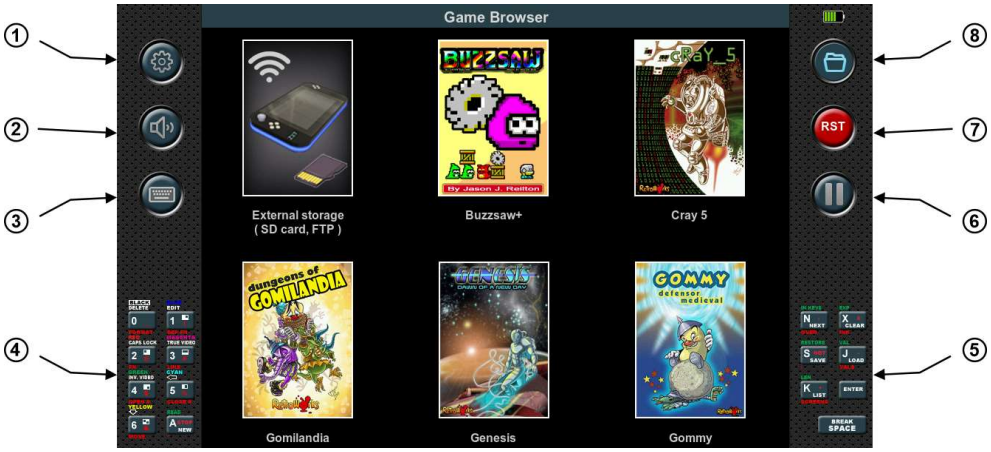

Figure 2.

The display is divided into three sections: left, centre, and right. The left and right sections of the screen are constantly visible, while the central section, which is the largest, is dedicated to the game itself, as well as the game browser or settings menu.
In the image above, the central section displays an open game browser, which allows users to launch built-in games or games stored on the SD card. A more detailed explanation of how to use the game browser will be provided later.

1. Settings button:

Tapping this button at any time opens the settings menu, and if the emulation is running, it will be paused. Pressing the button again will make the settings menu disappear, and the emulation will resume functioning as before.

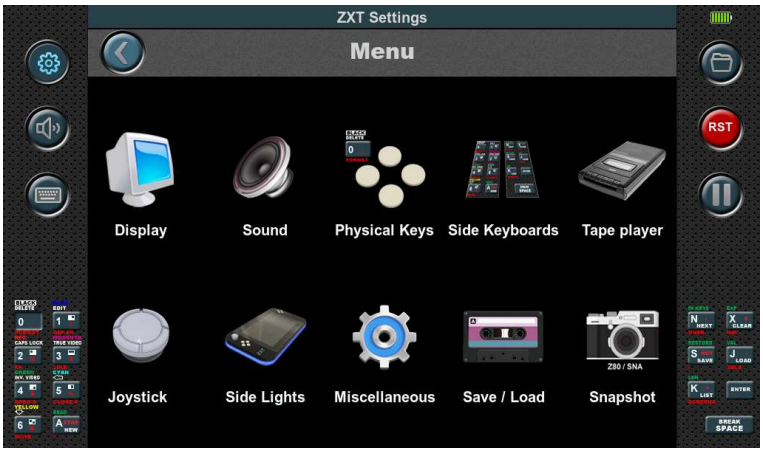

Figure 3.

2. Mute button:

Tapping this button will completely mute the sound. Tapping it again will restore the sound to the previously adjusted volume.

3. ZX Spectrum keyboard button:

This button is only active during emulation. It opens the complete virtual keyboard of the ZX Spectrum in the lower part of central section. To ensure the visibility of the emulation screen, it shrinks from 3:1 to 2:1 and moves upwards, while the left and right sections expand to incorporate additional functions. If it is pressed again, everything returns to its previous state.

Figure 4.

In addition to the standard keyboard with the 48K Spectrum layout, users can select a significantly larger keyboard designed for faster typing. This keyboard is particularly useful when the console is placed on a stand at a slight angle, making it much more comfortable for playing text adventures or using BASIC.

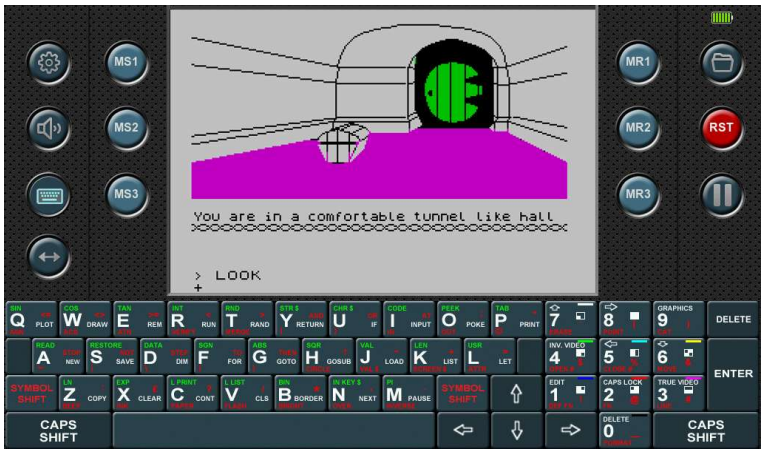

Figure 4a.

To further enhance the text adventure experience, a new button on the left side of the screen appears when the keyboard is displayed, allowing players to activate an expanded view. Although this view

distorts the aspect ratio, it improves text readability, making gameplay smoother and more enjoyable.

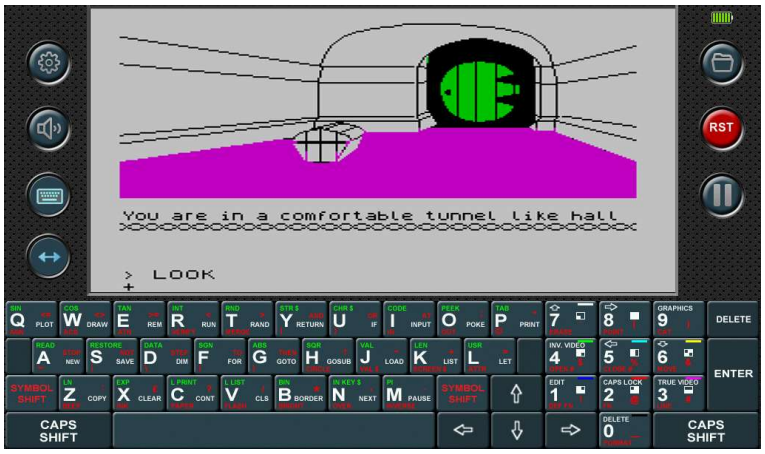

Figure 4b.

4. Left-Side Virtual Keyboard:
This is an 8-key keyboard that can be customised with any of the ZX Spectrum keyboard keys. It is active during emulation and provides quick access to frequently used keys.

5. Right-Side Virtual Keyboard:
Similar to the left-side virtual keyboard, this also features 7 keys. However, two keys on this keyboard, namely Enter and Space, are fixed and cannot be changed.

6. Pause button
This button is used to freeze the emulation. By pressing it again, the emulation will resume and continue running.

7. RESET button
This button represents the RESET of the emulated ZX Spectrum computer. By pressing it, the computer boots from its ROM.

8. Game browser button
By tapping this button, the game browser will appear, regardless of whether the emulation is currently active or if you are in the settings menu. If the emulation was active, it will be paused, and pressing the button again will automatically resume the emulation.

9. Extended left and right section
During emulation, when the keyboard view is selected, the left and right sections expand, revealing additional functions.

9a. Sound volume and display backlight
In the lower part of the left and right section, there are convenient sliders for adjusting the volume of the sound and the backlight of the screen. These sliders are shortcuts to functions that can be found in the settings menu.

9b. Saving and loading game position

On the upper left side, three buttons are present: **MS1, MS2, MS3**.
By pressing one of these three buttons during emulation, the current state of the game is saved in one of three memory slots, depending on which button is pressed. This snapshot is then stored as an SNA file on an SD card. The filename and location of the snapshot file match the name and location of the running game, with only the file extension being different. If it is a built-in game, the snapshot file is saved in a dedicated directory called **ZXT_SYSTEM_TEMP**. However, if this directory is not found on the SD card, the save operation will be unsuccessful. MSx buttons are inactive during tape playback, that is, while a game is loading via the tape player.
On the right side, there are three buttons: **MR1, MR2, MR3.**
These buttons enable the loading of a previously saved game position from the corresponding memory slot.
If the emulation screen is 3:1 and covers these additional functions, these functions still work even though they are not visible on the screen. So, during the game it is not necessary to press the keyboard button and then one of the Mxx buttons, it is enough to guess and press the position of the Mxx buttons or sliders.

3.1. Game browser

When the console is powered on, the game browser automatically opens, presenting the icons of the built-in games (Figure 2.). Tapping on a game icon opens a window displaying information about the game. Pressing the start button initiates the game, while pressing cancel returns to the game selection screen.
The first icon is not a game, but serves as a transition to display the contents of the SD memory card.

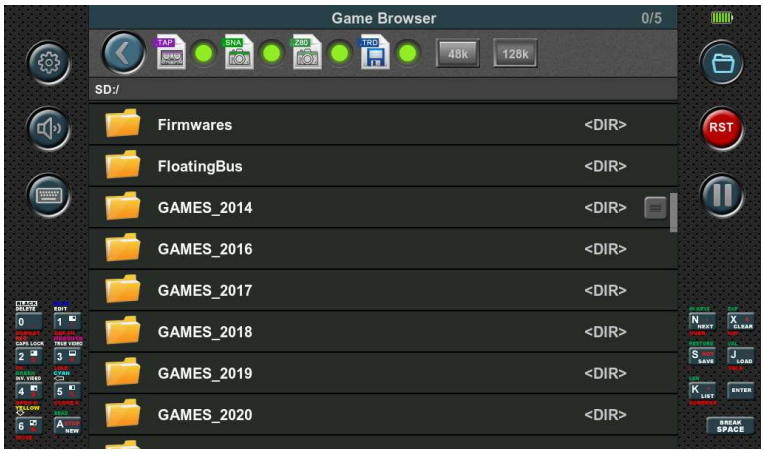

Figure 5.

ZX Touch supports a variety of game file formats, including tape formats TAP and TZX, snapshot formats Z80 and SNA, and disk formats TRD and SCL.
The game browser presents the files in a scrollable list format, displaying only those files in the directory that can be loaded. The list also includes all subdirectories. Navigating through directories is accomplished by tapping on the directory bar, and to return, simply use the back button located at the top of the list.
To start a game, tap on the bar displaying the game's name. Depending on the button selected at the top of the list, the appropriate emulation for either the 48K or 128K game will be launched.

3.1.1. File management

In the top-left corner of the screen, you'll find a filter that allows you to select which file types are visible in the list. By default, when the console starts, it displays the game file types (.TAP, .TZX, .SNA, .Z80, .TRD, .SCL), including .POK files, which will be explained in later chapters.
Using the filter, you can also enable additional file types, such as .JPG, .BMP, and .TXT, which the console can open. Alternatively, you can select the "ALL" filter to display every file on the SD card. Please note that you can scroll left or right through the filter icons, as not all options are visible on the screen at once.
The ZXT can open .JPG and .TXT files directly. Tapping on a .JPG file will open the image viewer, while tapping on a .TXT file will open the text viewer. These tools are particularly useful when preparing ZTG files, which will be covered in more detail later.
ZTG files are always visible, as they are unique to the ZXT console, and you'll find more information on how to work with them in the upcoming sections of this user manual.
By pressing and holding on the file name box, as shown in the image below (Figure 5a.), a small progress bar will appear. After approximately 2 seconds, the file menu will pop up. Among other options, this menu includes standard file management functions: copy, cut, paste, rename, delete, and create folder.

Figure 5a.

For actions like paste and create, you can also press and hold an empty space in the file list. Note that folders can only be deleted if they are empty, and the rename function allows you to change only the first part of the file name, not the file extension.

3.2. Settings

When tapping on the settings button, the icon menu will appear, as depicted in Figure 3.
The menu offers ten choices: Display, Sound, Physical Keys, Side Keyboard, Tape player, Joystick, Side Lights, Miscellaneous, Save/Load and Snapshot.

3.2.1. Display

Selecting the Display icon will display the following view:

Figure 6.

Since not all available options fit on one screen, there is the ability to scroll up and down to view the full list. On Figure 6, the first part of this menu is shown, while the second and third part is displayed on Figures 6a and 6b..

3.2.1.1. Display size

There are two available screen sizes for emulation: x2 and x3.
In x2 size, each pixel of the ZX Spectrum is enlarged twice, resulting in a display of 2x2 pixels on the ZXT screen.
In x3 size, each pixel of the ZX Spectrum is enlarged three times, resulting in a display of 3x3 pixels on the ZXT screen.
These options allow users to choose the desired level of pixel enlargement for an optimal viewing experience.

3.2.1.2. Brightness

This slider controls the intensity of the backlight. By adjusting the position of the slider, you can increase or decrease the brightness of the backlight according to your preference.

3.2.1.3. ULAplus™ colours

By enabling the ULAplus™ colours option on the ZXT console, you unlock the ability to display the ULAplus™ colour palette. This option allows each original ZX Spectrum colour to be substituted with one from the extended palette. Not only does it facilitate colour transformation, but it also enables a broader range of colours to be displayed on the screen by using additional bits from the attribute information.
It's important to note that the ULAplus™ option is only meaningful if the specific game or software being used supports it.

3.2.1.4. Interlaced

When the interlaced mode is enabled on the ZXT console, ZX Spectrum frames are displayed on alternating ZXT lines. Specifically, even ZX Spectrum frames are shown on even-numbered ZXT lines, while odd ZX Spectrum frames are displayed on odd-numbered ZXT lines. It is advised to use this mode primarily for software that utilises the "interlaced effect" to enhance vertical resolution. In such cases, the ZXT console will provide a highly stable "interlaced" picture.
However, for software that does not employ the interlaced effect, it is recommended to disable this option.

3.2.1.5. Scanlines

By enabling this option, depending on the selected display size of either x2 or x3, every second or every third line of the ZXT display is not shown. This intentional omission creates an effect reminiscent of the visuals on older CRT monitors or arcade machines, adding a touch of nostalgia to the image.

3.2.1.6. Side Keyboards

This option enables the ability to toggle the side keyboards on or off. When this option is enabled, the side keyboards will be displayed, providing additional input functionality. On the other hand, disabling this option will hide the side keyboards, removing them from view.

3.2.1.7. Soft Joystick

By enabling this option, the display of the side keyboards is automatically deactivated, and a soft joystick appears in their place. This provides a smartphone-like input experience, allowing users to control the ZXT console using a virtual joystick instead of physical keys.
Additionally, there is an option available to swap the left and right sides, providing flexibility in terms of joystick placement.

3.2.1.8. Title Screen

While the ZXT console already has a quick startup time due to the absence of an operating system, enabling this option allows for an even faster boot-up by skipping the display of the title screen. Please note that this option is only meaningful if the configuration is saved in the default slot. If the configuration is not saved in the default slot, enabling this option will have no effect and it will be forgotten upon shutting down the console.

The title screen can be customised by replacing the original image with your own. This is done by selecting the "custom" option. By selecting the "Set" button, users can upload a .bmp image stored on the SD card in the ZXT_SYSTEM folder to the console’s memory. The image file must be named "TitleScreen.bmp" to be recognised.
Once the custom image is uploaded, it is saved in the console’s internal memory, and the original welcome image remains intact. The SD card does not need to remain inserted for the custom welcome image to work. Users can choose between the original and the custom images using the "custom" option in the Display settings menu.

The custom image must be in .bmp format, and .jpg images are not supported. It must also have a maximum resolution of 1024x600. If a smaller resolution is used, the image will be centred on the screen. Aspect ratio is flexible, and the image can be in 16, 24, or 32-bit colour depth; however, 8-bit images are not supported.

3.2.1.9. Text Adventure/Programming Keyboard

This feature allows users to replace the standard keyboard with a larger one. Although the layout differs from the original, it facilitates much faster and more comfortable input.

Figure 6a.

Note: When selecting this keyboard, the sliders for adjusting the sound volume and screen brightness become unavailable during emulation. However, these settings can still be adjusted in the settings menu. Since volume adjustment is frequently used, physical keys can be mapped for sound volume control. Instructions on how to use and configure this feature can be found in the "Settings - Physical Keys" section.

3.2.1.10. Hide Control Sections

To provide a more immersive gaming experience, ZX Touch allows you to hide the control sections on the left and right sides of the screen, reducing distractions and focusing on gameplay.

There are two available modes for hiding the control sections:

- **Manual Mode**: After the game starts, tap the emulated screen with two fingers to hide the control sections. To bring them back, tap the screen with one finger.

- **Automatic Mode**: In this mode, the control sections are hidden automatically when the game starts. Touching the screen will reveal the sections and pause the game.

You can select between these modes using the **Auto** option, located next to the button that enables the feature.

3.2.1.11. Hide Main Dashboard

This option allows users to hide the main dashboard, which features built-in games. When enabled, the console will not display this dashboard in the list. Instead, when the console is powered on with an inserted SD card containing a saved dashboard layout, it will show the first dashboard from the user's list. The dashboard with built-in games will remain hidden. If no SD card is inserted, this option has no effect, and the dashboard with built-in games will be displayed.

3.2.1.12. ZX Touch FX System

ZX Touch FX is a visual enhancement system that improves the appearance of ZX Spectrum games without modifying the original game.
It operates as a real-time processing layer applied to the image generated by the emulator, allowing changes such as colour adjustments, edge enhancement, transparency and background integration.
All FX options can be used independently, but they can also be combined to achieve more advanced visual results.
For a more detailed explanation of how the system works and how to create advanced configurations, refer to the **ZX_Touch_FX_Guide.pdf** document.

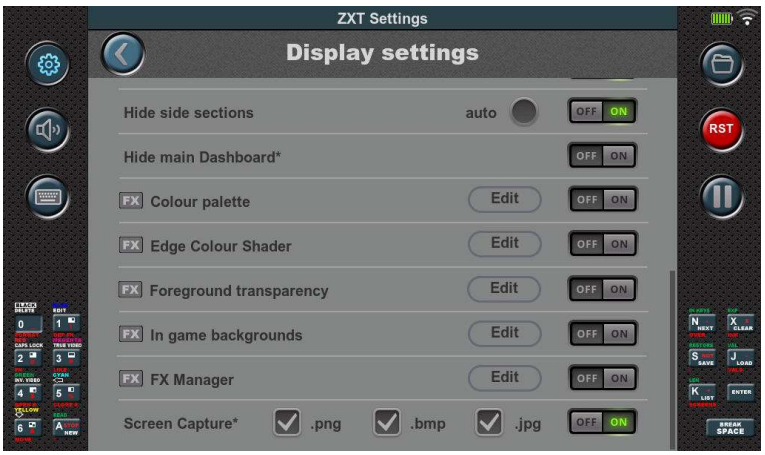

Figure 6b.

3.2.1.12.1. Colour palette

This option allows modification of the ZX Spectrum colour palette and is part of the ZX Touch FX system. It can be used independently or in combination with other FX features, and can also be controlled dynamically using the FX Manager.
It offers an alternative to the ULAplus™ enhancement. While ULAplus™ requires software support or additional initialisation, this feature enables direct adjustment of colours for any game directly through the ZX Touch interface.
The colour palette can be enabled or disabled using the on/off button. When enabled, colours can be adjusted by selecting the Edit option.

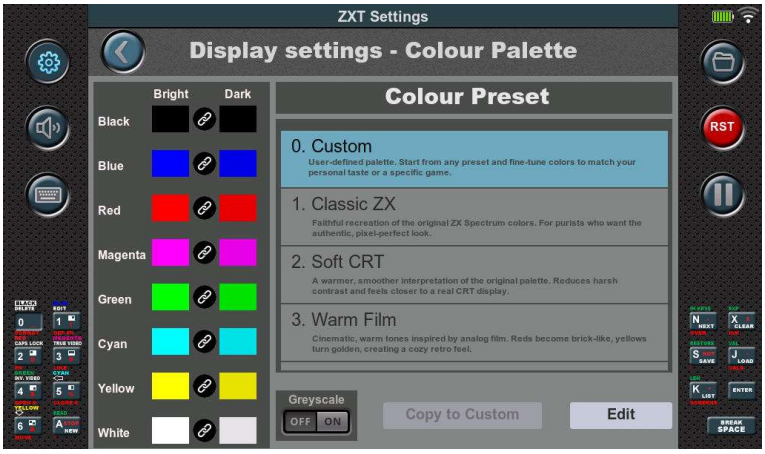

Figure 6c.

When the Colour Palette screen is opened (Figure 6c), the available presets are displayed. A number of predefined presets are available, each providing a different visual style that can be applied instantly.
Preset **0 – Custom** is the only preset that can be edited. All other presets are fixed and cannot be modified directly.
Other presets can be used in two ways:
they can be applied directly to change the appearance of the game
they can be used as a starting point by copying them into the Custom preset and then adjusting them further

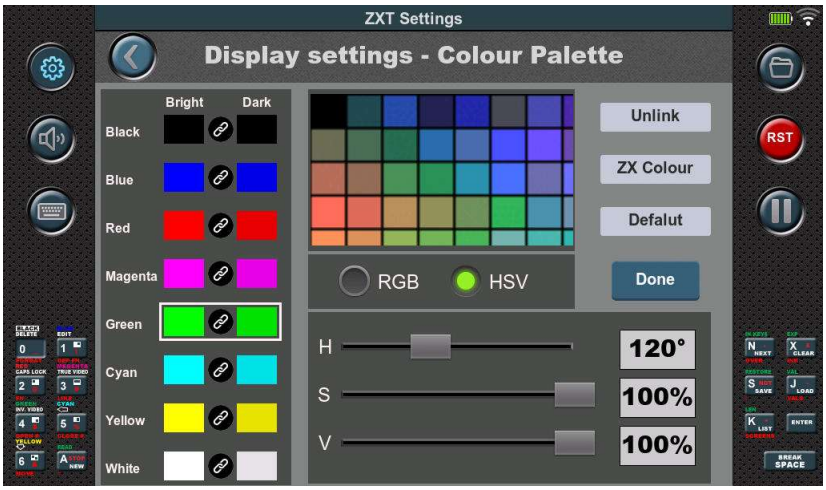

Figure 6d.

After selecting the Custom preset and pressing Edit, the palette editing screen is opened (Figure 6d). On the left side of the screen, all 8 ZX Spectrum colours are displayed together with their darker variants, resulting in a total of 16 colours. Selecting a colour pair allows it to be modified.
By default, the darker variant is linked to the main colour and updates automatically. This behaviour can be changed using the **Unlink** button, which allows both colours to be adjusted independently.
Colours can be adjusted in two ways. A colour can be selected from the palette grid in the centre of the screen, or it can be fine-tuned using sliders. Two editing modes are available:

- **RGB mode** for direct adjustment of red, green and blue components
- **HSV mode** for intuitive control over hue, saturation and brightness

On the right side of the screen, several additional options are available:
Unlink – separates the bright and dark variants of the selected colour
ZX Colour – restores the original ZX Spectrum colour
Default – restores the colour from the saved default configuration
A **Greyscale** option is also available, which displays the palette in monochrome, similar to a black-and-white display.
The palette can also be changed during gameplay using assigned controls, allowing quick switching between different visual styles.
For more advanced usage and interaction with other FX components, refer to the *ZX Touch FX Guide* document.

3.2.1.12.2. Edge Colour Shader

This option enhances ZX Spectrum graphics and is part of the ZX Touch FX system. It can be used independently or together with other FX features, and can also be controlled dynamically using the FX Manager.
The Edge Colour Shader improves object visibility and adds a sense of depth by modifying how edges are displayed. It creates a controlled outline around objects and introduces additional shading, which is especially important when backgrounds are used.
When the Edge Colour Shader screen is opened (Figure 6e), the main configuration options are displayed.

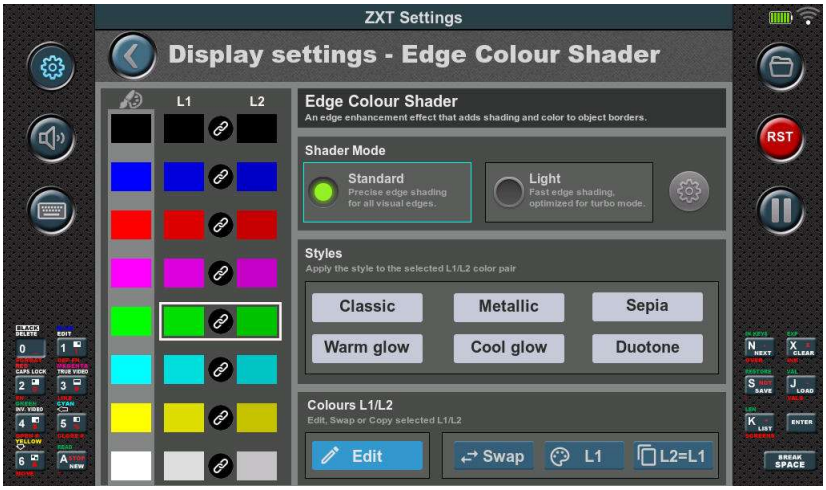

Figure 6e.

On the left side of the screen, all ZX Spectrum colours are shown together with their corresponding edge levels:

- **L1 (Level 1)** – pixels closest to the edge
- **L2 (Level 2)** – pixels slightly further inside the object

These two levels define how edge pixels are coloured. Inner pixels that are not part of an edge remain unchanged (or become transparent if selected as background colour).
At the top of the screen, the shader mode can be selected:

- **Standard** – provides the most accurate and complete edge detection
- **Light** – faster but simplified, intended for performance-critical scenarios

In most cases, Standard mode provides the best visual result.
Next to the shader mode selection, an additional settings menu is available via the gear icon.
This opens the **Edge Colour Shader Options** dialogue, which provides more control over how the shader is applied.
The following options are available:

- **Process Paper only** – the shader is applied only to pixels that belong to the paper (background) area
- **Process Ink only** – the shader is applied only to pixels that belong to the ink (foreground) area
- **Process Both (Paper & Ink)** – the shader is applied to both pixel types (default and most commonly used option)

In most cases, *Process Both* provides the most balanced result, while the other options can be used for specific visual effects.
Additional options:

- **Use Background colour(s) as Paper** – treats selected background colours as paper pixels, regardless of how they are defined in the original image. This can be useful when games use non-standard drawing techniques or reuse colours in different roles.
- **Auto Background Colour Detection** – automatically detects the background colour based on the current screen. This is useful when FX Manager is not used and the background colour changes during gameplay.

Below these options, a set of predefined **Styles** is available. These styles automatically assign L1 and L2 colours based on the current Colour Palette. Available styles include:

- Classic
- Metallic
- Sepia
- Warm glow
- Cool glow
- Duotone

Styles provide a quick way to achieve a consistent look, but the final result depends on the active Colour Palette. The same style may produce different results with different palettes.
At the bottom of the screen, quick editing tools are available for the selected colour:

- **Edit** – opens the colour editing screen
- **Swap** – exchanges L1 and L2 values
- **L1** – copies the base palette colour to L1
- **L2 = L1** – copies the L1 value to L2

These tools allow fast adjustment without entering the editor.
Selecting **Edit** opens the colour editing screen, which is similar to the Colour Palette editor (see Figure 6d). In this screen, L1 and L2 values can be adjusted manually for each ZX colour.
Colours can be edited using:

- a colour selection grid

- **RGB mode** for direct channel control
- **HSV mode** for intuitive visual adjustment
- sliders for fine tuning

Additional buttons include:

- **ZX Colour** – restores the original ZX Spectrum colour
- **Default** – restores the saved default value
- **Done** – exits the editor

Unlike the Colour Palette, L1 and L2 values are always edited independently.
The Edge Colour Shader plays an important role when backgrounds are used. Pixels that form edges are never fully transparent. Instead, they are replaced with L1 or L2 colours, which creates a visible outline around objects and prevents them from blending into the background.
The final result depends strongly on the interaction between the Colour Palette, Edge Colour Shader and selected transparent colours. For this reason, adjustments to one component may require fine tuning of the others.
For more advanced behaviour, detailed configuration options and practical usage guidelines, refer to the *ZX Touch FX Guide* document.

3.2.1.12.3. Foreground Transparency

This option controls the visibility of the ZX Spectrum image in relation to the background and is part of the ZX Touch FX system. It can be used independently or together with other FX features, and can also be controlled dynamically using the FX Manager.
Foreground Transparency does not define which pixels are transparent. This is controlled by the selected transparent colours in the In-game Backgrounds option. Instead, it controls how visible the remaining (non-transparent) parts of the image are.
When the Foreground Transparency option is opened (Figure 6f), a simple adjustment window is displayed.

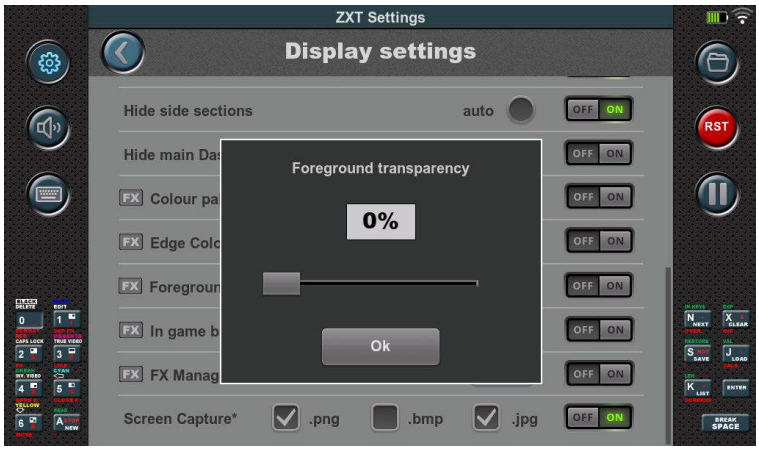

Figure 6f.

The transparency level is adjusted using a slider, with values ranging from:

- **0%** – the ZX Spectrum image is fully visible
- **100%** – the ZX Spectrum image is completely invisible

This adjustment is applied uniformly to all visible pixels. Pixels that are already fully transparent are not affected.
Foreground Transparency can be used in several ways. At lower values, it allows the background to subtly show through the image, adding texture and reducing the contrast between foreground and background. This can make the final image appear more cohesive.
At higher values, the ZX Spectrum image becomes less dominant. At **100%**, the original image is completely hidden and only the background remains visible. This is useful for screens such as menus or loading screens where the original graphics do not need to be displayed.
The final result depends on the interaction between the Colour Palette, Edge Colour Shader and background image. Small adjustments are often sufficient to achieve the desired effect.
For more advanced usage and practical examples, refer to the *ZX Touch FX Guide* document.

3.2.1.12.4. In-game Backgrounds

This option allows ZX Spectrum graphics to be visually enhanced by placing a custom image behind the original game output and is part of the ZX Touch FX system. It can be used independently or together with other FX features, and can also be controlled dynamically using the FX Manager.
The background is displayed by making selected ZX Spectrum colours transparent, allowing the background image to be visible through those areas. This process is applied in real time while the game is running.
The main purpose of backgrounds is to replace large flat colour areas with visually richer content, while preserving the original game graphics and gameplay.

Transparent Colours

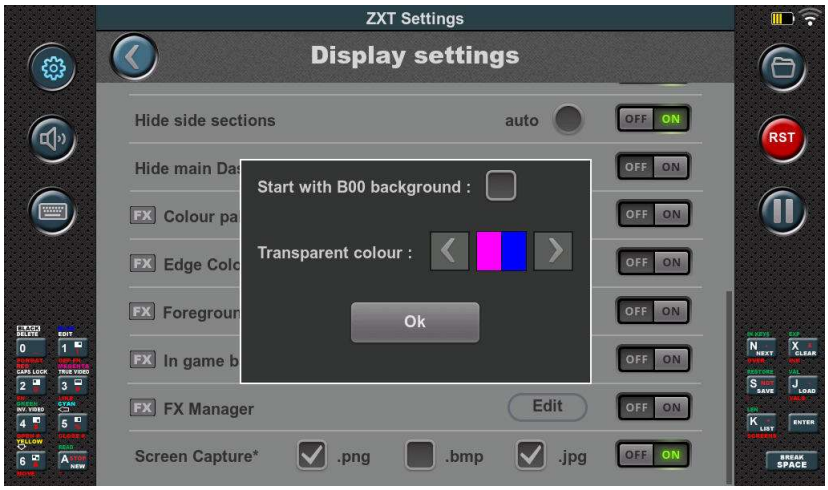

Figure 6g.

Background visibility is controlled by selecting transparent colours.
The system supports selecting **up to two transparent colours**. In most cases, a single transparent colour is sufficient, especially when the game uses one dominant background colour.
However, two transparent colours can be used in more complex situations, for example:

- when different parts of the screen use different background colours
- when both gameplay area and interface elements should reveal the background
- when scenes contain multiple large colour regions (e.g. sky and ground)

Only pixels using the selected ZX colours become transparent. All other pixels remain fully visible. Transparent colours are selected using left/right controls. When selecting the second transparent colour, the already selected colour is automatically skipped, so the same colour cannot be selected twice.

Interaction with Shader and Palette

Transparency is applied after Colour Palette and Edge Colour Shader processing.
Pixels that are part of edges (L1 and L2) are not fully transparent, even if their original ZX colour is selected as transparent. Instead, they are displayed using shader colours. This creates a visible outline around objects and ensures proper separation from the background.
The final result depends on the combined effect of:

- Colour Palette
- Edge Colour Shader
- selected transparent colours
- background image

For best results, these components should be adjusted together.

Background Images

Background images are stored in the ZTG file and are not limited by ZX Spectrum colour restrictions.
Images can have a higher resolution than the original ZX Spectrum image and are automatically scaled to fit the display area.
For best visual results, it is recommended to use resolutions proportional to the ZX Spectrum resolution (256 × 192), such as:

- 256 × 192
- 512 × 384
- 768 × 576

This helps avoid unwanted scaling artefacts.

Start with Background

The option **Start with B00 background** determines whether a background image is active when the game starts.

- When enabled, background B00 is displayed immediately
- When disabled, backgrounds are initially turned off

This option is mainly useful when backgrounds are used without FX Manager.

Background Control During Gameplay

Besides being controlled by the FX Manager, background images can be controlled in two additional ways during gameplay.

Manual control

A physical button can be assigned as a function (Fn) button. When this button is held, pressing left or right on the opposite D-pad cycles through available background images.
When a game starts, the background is initially off. Pressing the function button together with the right direction selects the first background image. Repeating this action cycles through the available images. Using the opposite direction cycles back through the list.

Control from game code

Background images and transparent colours can also be controlled directly from within the game using the ZX Spectrum OUT instruction. This allows automatic switching from within the game code, for example when changing levels or scenes. Port **31** is used for this control.

Example in BASIC:
PAPER 0
OUT 31,0

This command displays the first background image (B00).
Additional values:

- `OUT 31,1` – displays the second background image (B01)
- …
- `OUT 31,99` – displays the last background image (B99 if available)
- `OUT 31,255` – turns the background off

Transparent colours can also be controlled using values from 200 to 235:

- `OUT 31,200` – sets black as the transparent colour

200		206		212		218		224		230	
201		207		213		219		225		231	
202		208		214		220		226		232	
203		209		215		221		227		233	
204		210		216		222		228		234	
205		211		217		223		229		235	

In addition to background and transparent colours control, FX configurations stored in FX Manager slots can also be selected using the same port.

Slots 0–9 are selected with values 100–109 (e.g. `OUT 31,102` selects slot 2).

The Backgrounds option must be enabled in Display Settings for any of these commands to have effect. FX configurations must be stored in FX Manager slots (saved in the ZTG file); FX Manager does not need to have any markers defined.

3.2.1.12.5. FX Manager

FX Manager is an advanced part of the ZX Touch FX system that allows visual settings to change automatically during gameplay. It can control the **Colour Palette, Edge Colour Shader, Foreground Transparency and In-game Backgrounds** based on what appears on the screen. Instead of using a single visual setup for the entire game, FX Manager allows different visual styles to be applied to menus, gameplay, levels or other scenes, without modifying the original game. When the FX Manager screen is opened (Figure 6h), all configuration elements are available in one place.

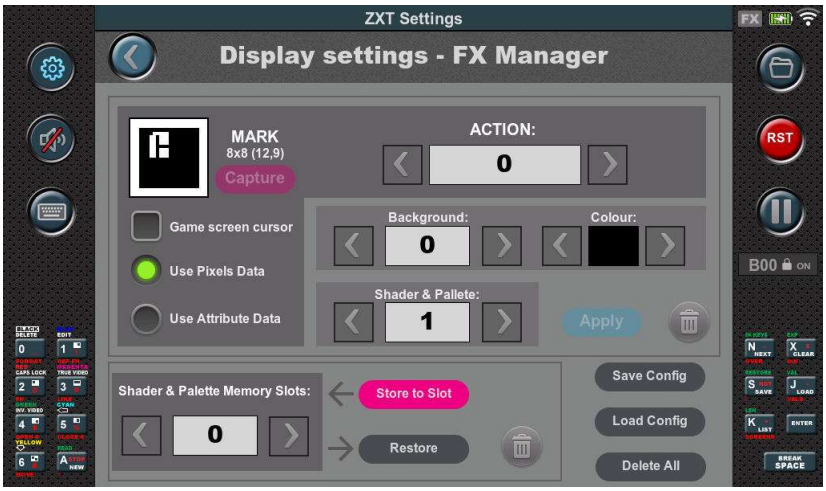

Figure 6h.

Basic Principle

FX Manager works using a **marker → action** system.

- A **marker** is a small fragment of the screen captured at a specific position
- When that marker is detected, a corresponding **action** is triggered

Each action defines:

- which background image will be used
- which transparent colour or colours will be applied
- which FX slot will be activated

Detection is performed continuously while the game is running. When a marker is detected, its action is applied immediately and remains active until another marker is detected.

FX Slots

FX Manager uses **slots** to store complete visual configurations.
Each slot contains:

- Colour Palette
- Edge Colour Shader settings
- Foreground Transparency

- FX enable states

Up to **10 slots (0–9)** are available.
Slots are passive storage. To use them:

- **Store to Slot** saves the current FX configuration into the selected slot
- **Restore** loads a slot back into the current settings

A typical workflow is:

1. Configure a visual style using palette, shader and transparency
2. Store it into a slot
3. Repeat for other styles
4. Assign slots to actions

This allows instant switching between different visual setups during gameplay.

Markers and Actions

FX Manager supports multiple markers, each linked to one action.
Markers are captured from a defined screen area. The available marker sizes are:

- **8 × 8 pixels**
- **16 × 8 pixels**
- **8 × 16 pixels**

The size is selected using the right button on the right D-pad while the cursor is active.
To capture a marker:

1. Start the game and pause at the desired screen
2. Open FX Manager and enable the **Game screen cursor** option
3. Press the **Settings** button (top-left corner) to switch to the emulator screen
4. Move the cursor using the left D-pad to a stable area (e.g. score, HUD, static text)
5. Select the marker size using the right D-pad
6. Press the **Settings** button again to return to FX Manager
7. Press **Capture** to store the marker

Navigation between FX Manager and the emulator screen must always be done using the **Settings toggle button**. The **Back** button must not be used, as this will exit the cursor mode.
After capturing a marker, define the corresponding action:

- select background image
- select transparent colour(s)
- assign an FX slot

Press **Apply** to save the action.
Markers should be placed on stable elements that do not change during gameplay. This ensures reliable detection.

At Start Action

FX Manager includes a special action called **At Start**.
This action is applied automatically when the game begins, before any markers are detected.
It is typically used to define:

- initial background
- initial transparent colour(s)
- initial FX slot (which includes Colour Palette, Edge Colour Shader, Foreground Transparency and FX enable states)

This ensures that the game starts with a defined visual setup.

Background and FX Control

FX Manager overrides manual settings when actions are triggered.
Each action defines:

- background image
- transparent colour(s)
- FX slot

When a marker is detected, all of these parameters are applied instantly. This allows automatic switching of visual styles between different scenes without user interaction.

Working with FX Manager

FX Manager can be used in different ways depending on the complexity of the setup.
For simple configurations:

- use a single slot
- define only the At Start action

For more advanced configurations:

- create multiple slots (e.g. menu, gameplay, levels)
- assign markers for different scenes
- switch backgrounds and FX settings automatically

Important Behaviour

FX Manager does not modify the original game. All changes are applied as a visual layer.
The current FX settings always reflect the last activated action. When a new marker is detected, the system switches to the new configuration instantly.
If FX Manager is disabled, all stored markers, actions and slots remain unchanged and can be used again when it is re-enabled.
FX Manager is most effective when used together with Colour Palette, Edge Colour Shader, Foreground Transparency and Backgrounds.

For detailed behaviour, advanced configuration and full workflow examples, refer to the ZX Touch FX Guide document.

3.2.1.13. Screen Capture

Screen Capture is a general tool that allows saving the current screen image to the SD card. It can be used at any time to capture the current view of the console, whether the screen shows the emulator, settings menu or another part of the user interface.
At the same time, this tool is especially useful when preparing in-game backgrounds. In particular, the PNG format is intended for this purpose, as it captures the game image without the background, leaving transparent only those areas where the background should be visible.

Enabling Screen Capture

Screen Capture is enabled in the Display Settings menu.
The following output formats are available:

- **PNG**
- **JPG**
- **BMP**

One or more formats can be enabled at the same time. When a capture is performed, a file is created in each selected format.

Taking a Screenshot

A screenshot is taken using the **Fn shortcut**.
While holding the **Fn button together with its nearest adjacent button**, press **Right on the opposite D-pad**.
If the Function key behaviour is not familiar, refer to the section that explains the **Fn** button in the Physical Keys settings.
After the screenshot is taken, a short confirmation message appears in the upper-left corner of the screen on a yellow background.

Captured Image Content

The content of the captured image depends on the selected output format and on whether a background is currently active.

- **PNG format (512 × 384)**
  If no background is active, the PNG file contains a clean image of the emulator output, including the current palette and shader processing.
  If a background is active, the PNG file contains only the foreground image, while the background areas remain transparent. This makes PNG especially useful when creating background images, because it provides an exact reference layer for image editing.
- **JPG and BMP formats (1024 × 600)**
  These formats contain the final image exactly as displayed on the screen, including the background if one is active. They are useful for documentation, testing and general image capture.

File Location and Naming

Captured files are stored on the SD card in the following directory:
`SD:/cap`

If this directory does not already exist, it is created automatically.
Files are named using sequential numbering, for example:

- `cap_0001.png`
- `cap_0001.jpg`
- `cap_0001.bmp`

The numbering always continues from the highest existing number, so previously captured files are not overwritten.

3.2.2. Sound

Selecting the Sound icon will display the following view:

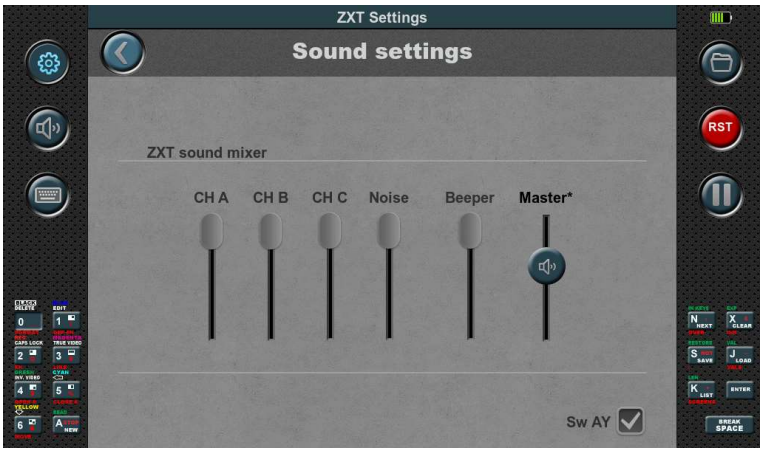

Figure 7.

The ZX Spectrum 128K featured a multi-channel sound system capable of producing three channels of square wave and one channel of noise. Additionally, it inherited the ability to reproduce the Beeper sound from the ZX Spectrum 48K. In the ZXT console, you have the option to individually control the volume of all five mentioned channels. Furthermore, there is a master volume slider available, which adjusts the overall volume output to the speaker or headphones.

The ZX Touch primarily generates AY sound through hardware, with minimal software assistance, maintaining the authentic audio quality characteristic of classic ZX Spectrum games. For an alternative audio experience, users can enable the software emulation option which fully generates AY sound through software, specially equalised to enhance bass tones. This adjustment is particularly noticeable when using headphones. To enable this feature, simply check the 'Sw AY' box located in the bottom right corner of the sound settings screen.

3.2.3. Physical keys

Selecting the Physical keys icon will display the following view:

Figure 8.

This configuration allows you to assign any keyboard key or Kempston joystick direction to the physical keys of the console. As many ZX Spectrum games have different keyboard keys for control, this option becomes necessary to ensure compatibility with all games using the physical keys.
Setting up the key mapping is a straightforward process. Firstly, you need to select the physical key you wish to map by tapping on the corresponding box representing the physical key. Then, press the desired button on the virtual keyboard to establish the connection. Once mapped, the assigned keyboard key will be displayed inside the box.

In addition to keyboard keys, directions and the fire button of the Kempston joystick can also be assigned to specific physical buttons, expanding the range of control options.

Mapping can also be done using presets, which simplifies the process by automatically assigning all eight physical keys at once. This feature saves time and effort, allowing for quick and convenient mapping of the physical keys without the need for individual assignments.

Additionally, you have the option to leave a specific physical key unpaired (blank). This can be done using the delete button, allowing you to keep some keys unused if necessary.

3.2.3.1. Function Key

One of the eight physical keys can be assigned as a **Function key**. The Function key is not a ZX Spectrum key but allows for console-specific actions when combined with other physical keys.
To assign a **Function key** to a physical key, first select the physical key box on the screen, then press the virtual **Fn** button on the screen. A light blue border will appear around the selected physical key box, indicating that it has been assigned as the Function key. The **Fn** button is a toggle, so pressing it again will remove the Function key assignment.

If a physical key assigned as a **Function key** is not mapped to any other key, a Function key icon will appear in the box, along with the blue border. A single physical key can be mapped to both a ZX Spectrum key and serve as a **Function key** simultaneously.

When the Function key is assigned to the right D-pad, the four physical keys on the left D-pad are given special functions. Likewise, if the Function key is assigned to the left D-pad, these same functions apply to the right D-pad in the same order:

- **Up / Down** – adjusts the volume
- **Left / Right** – cycles through background images

In addition to these basic functions, the Function key also provides extended control over FX features and system functions. These actions are performed by holding the Function key together with its nearest adjacent key, and then pressing a direction on the opposite D-pad:

- **Up / Down** – cycles through Colour Palette presets
- **Right** – takes a screenshot (if Screen Capture is enabled)
- **Left** – toggles all FX features globally on or off

The global FX toggle allows quick comparison between the original game image and the enhanced version with FX enabled. When any FX feature is active, an **FX icon** is shown in the upper-right corner of the screen. If FX is disabled using this function, the icon appears crossed out.

By default, the Function key is mapped to the left button of the right D-pad. This key is expected to be the least used during gameplay. The Function key mapping is saved only in slots and not as part of an individual game configuration. This ensures that when loading ZTG files prepared by others, the mapping remains unchanged.

It’s recommended to map this key not only as a Function key but also to a keyboard key that selects the input method in a particular game. This way, after loading a game, pressing the key can also select the appropriate input method that matches the current key mapping. This approach maximises the utility of this key.

3.2.4. Side keyboards

Selecting the Side Keyboards icon will display the following view:

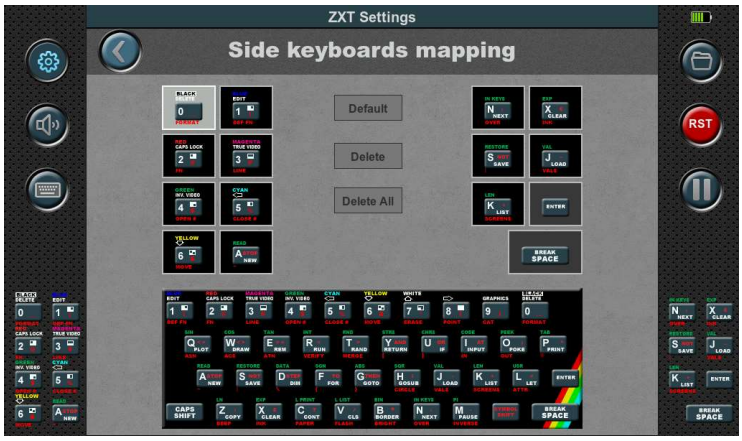

Figure 9.

In ZX Spectrum games, besides the control keys for gameplay, additional keys are often used to adjust game options or initiate the game. Different game developers utilise different keys for these purposes, making it highly convenient to have a dedicated set of keyboard keys readily accessible. This eliminates the need to frequently bring up the virtual keyboard and minimises interruptions to the gameplay experience.
Having a designated set of keyboard keys readily available allows for seamless and efficient interaction with the game, ensuring smooth navigation and quick access to essential functions.

The mapping of the side keyboard follows a similar process to that of the physical keys. To map a side keyboard key, you need to select the corresponding box and then tap on the virtual keyboard key you want to assign to it. Once mapped, the assigned button will be displayed inside the box.

Please note that the Enter and Space keys are always present on the right side of the side keyboard and cannot be remapped.

Additionally, there is a default button available, which automatically loads the layout of the side keyboard from the default configuration memory slot. This provides a convenient way to restore the default mappings if needed.
Furthermore, there are Delete and Delete All buttons provided for removing individual or all mappings from the side keyboard, allowing for customisation and adjustment as desired.

3.2.5. Tape player

The ZX Touch includes a tape player that simulates the playback of audio cassettes, enhancing the emulation experience for games stored in TAP and TZX formats. This tool is crucial for accurately loading games that do not use standard ZX Spectrum ROM loading routines, specifically games that were originally recorded on tape with copy protection or that have custom loaders.

Figure 10.

TAP files are composed of a single type of block, typically loaded at a standard speed using ZX Spectrum's ROM routines. This makes them well-suited for instant loading via tape traps. Tape traps allow the emulator to intercept standard ROM loading routines and instantaneously load the data block from the tape file into memory, facilitating quick loading without the audio playback.

Very rarely, games with custom loaders are also stored in TAP files because they are reproduced in the same manner as games that use ROM routines, only they use a custom loader instead of ROM routines. Such games, although stored in TAP format, cannot be instantly loaded using tape traps.

On the other hand, TZX files are more complex, featuring a variety of block types designed to preserve the diverse loading mechanisms employed by custom loaders and copy protection schemes. These blocks often require different playback methods and can only be accurately emulated through audio playback to reflect the original tape's behaviour. However, it is not uncommon for TZX files to be composed of standard ROM blocks which can be quickly loaded using tape traps.

The Tape Player in ZX Touch features three adjustable settings that cater to various tape loading preferences and requirements.

Disable Tape Traps: When this option is selected, the instant loading feature is disabled. Consequently, all TAP and TZX files will be loaded through simulated audio playback, ensuring a consistent approach for all tape files. By default, this option is turned off.

Auto Start/Stop Tape: This feature intelligently manages tape playback. It automatically activates playback when it detects that the game is attempting to read the tape and stops when it detects that the game is no longer trying to access the tape. By default, this option is turned on, ensuring seamless transitions during tape operations. If this option is disabled, the user must manually control the tape playback using the playback control buttons provided within the tape player interface. These buttons allow the user to start and stop the tape as needed, offering direct control over the loading process.

Loading Speed 200%: When activated, this option doubles the emulation speed specifically during tape playback, significantly reducing the time required to load games from tape. This feature is particularly useful for decreasing wait times during the loading process, as it accelerates only the tape loading phase, not the gameplay itself.

When the 'Disable Tape Traps' option is turned off and the 'Auto Start/Stop Tape' option is active, the ZX Touch efficiently handles tape files with a mix of standard ROM and other blocks. It swiftly uses tape traps to load standard ROM blocks. If it encounters any blocks that cannot be processed by tape traps, the system automatically switches to audio playback for accurate and uninterrupted loading.

Additionally, the Tape Player tool displays a list of all blocks in the TAP or TZX file at the bottom of the screen. For each block, it shows its ID, description, and size in bytes. Users can scroll through the list of blocks horizontally to view different entries. The ZX Touch also provides a visual indicator of tape progress within the Tape Player tool itself, as well as when the tool is closed. When running the emulation screen, tape progress is displayed on the right side of the screen, along with an icon indicating that the Tape Player is active, ensuring users can monitor loading progress at all times.

3.2.6. Joystick

Selecting the Joystick icon will display the following view:

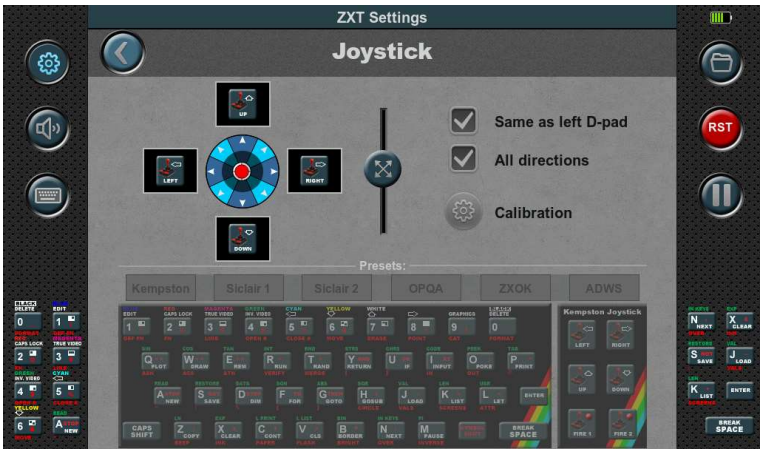

Figure 11.

The built-in joystick is analogue. However, the ZX Spectrum computer did not support this type of joystick and only had four basic directions: left, right, up, and down. It also supported four oblique directions, which were combinations of two directions, such as up and right.
Due to the nature of the ZX Spectrum's joysticks, this analogue joystick is mapped accordingly. Four keys are assigned to it, with one key for each basic direction.

However, the analogue nature of this joystick offers an advantage. It allows for the determination of the trigger position, which is visually indicated by a darkened circle. The radius of this circle can be adjusted using the slider located in the middle.

By default, the joystick is mapped in the same way as the left d-pad, but this can be changed by deselecting the "Same as left D-pad" option. In that case, the joystick can be mapped using the corresponding boxes and the virtual keyboard, just like the physical keys.
Similar to the presets available for physical buttons, there are also presets available for the analogue joystick.
Additionally, there is an "All directions" option. When enabled, the joystick has eight directions. When disabled, it only has the four basic directions and does not accept simultaneous input of two basic directions. This mode is suitable for certain games like PACMAN.

If the joystick is correctly calibrated, the red circle representing the position of the analogue joystick should be centred. As the joystick is moved, the red circle moves accordingly and should be able to reach the edges of the background circle, which are marked with arrows. If the joystick exceeds the trigger position (darkened circle), the corresponding boxes change colour from black to red.

If the calibration is not satisfactory or if the joystick has been replaced with a spare part, it is necessary to perform the calibration. On this screen, there is a button available to initiate the calibration process.

The calibration process consists of three steps:

Step 1.

Begin the calibration process by tapping the Start button. It is essential to remain patient for a few seconds while the progress bar on the right side gradually fills up. During this time, it is crucial to keep the joystick still and refrain from touching or moving it.

Figure 12.

Step 2.

In the second step, the joystick needs to be rotated to its extreme positions as indicated by the animation. The progress bar on the right side will track these rotations. Once the bar reaches the end, the second step is completed.

Figure 13.

Step 3.

The third step involves checking the operation of the joystick. After ensuring the joystick is functioning correctly, you can choose to either accept or reject the calibration.

Figure 14.

3.2.7. Side Lights

Selecting the Side Lights icon will display the following view:

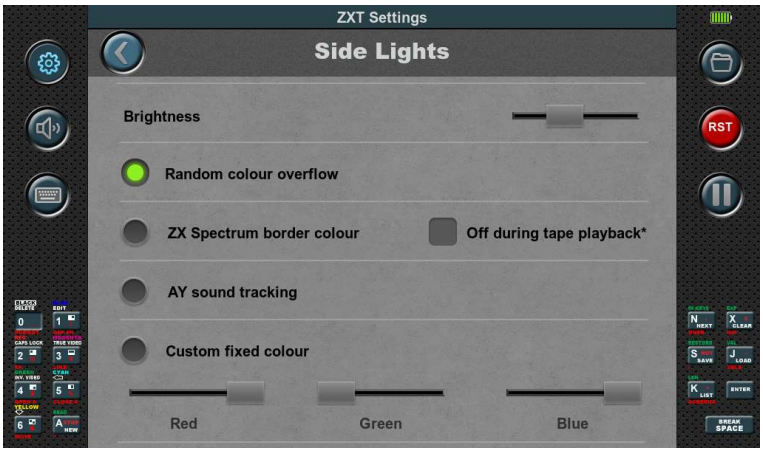

Figure 15.

In this configuration section, you can adjust the operation mode of the side lights. The first option, Brightness, allows you to control the brightness level using a slider.

There are four available operating modes for the side lights:

1. Random colour overflow: In this mode, the ZXT console automatically transitions between colours, with one colour persisting for a period before smoothly flowing into another.

2. ZX Spectrum border colour: The side lights' colour is determined by the current colour of the ZX Spectrum emulation's border on the screen. It synchronises the side lights with the border colour for a cohesive visual effect.

This operating mode includes an option to completely turn off the side lights during tape playback. When the tape is being played, the light reflecting the border colour can flash intensely, which may be particularly distracting for some users.

3. AY sound tracking: The intensity of the individual RGB colour components of the side lights follows the volume of the corresponding AY sound channel. This mode creates a dynamic lighting experience that reflects the audio output.

4. Custom fixed colour: You can manually set a constant colour for the side lights using individual sliders for the RGB colour components. This allows for personalised customisation of the side lights' appearance.

3.2.8. Miscellaneous

Selecting the Miscellaneous icon will display the following view:

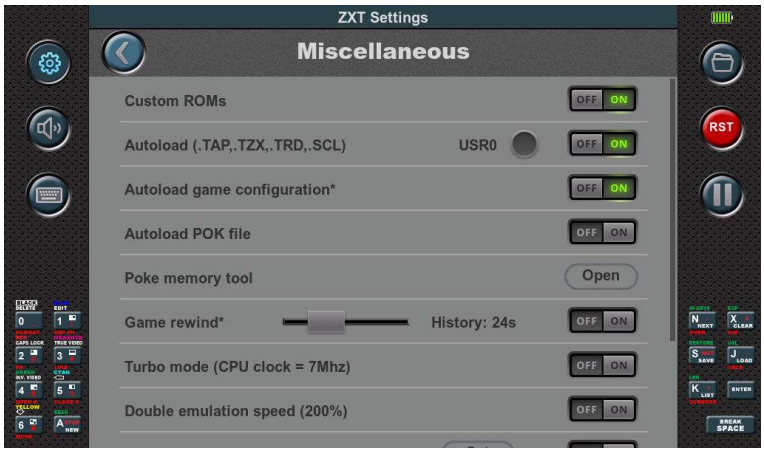

Figure 16.

3.2.8.1. Custom ROMs:

By default, the Custom ROM option is disabled on the ZXT console. However, enabling this option allows you to use alternative ROMs instead of the built-in SE Basic ROM.

To ensure full compatibility with games, it is recommended to use the original ROMs from the ZX Spectrum 48K and ZX Spectrum 128K computers. These ROM files should be placed in the "SD:\ROMs" directory on the SD card. The file names for the ROMs are predefined as follows: "48.rom" for a 48K computer, and "128-0.rom" and "128-1.rom" for a 128K computer.

If you intend to load games in TRD or SCL format, it is necessary to include the "trdos.rom" file in the same directory.

These ROM files can often be found online and are commonly bundled with various emulators. Remember to ensure that the ROM files you use are legally obtained and that you comply with any applicable copyright laws.

3.2.8.2. Autoload (.Tap, .TZX, .TRD, .SCL):

The automatic launch option for games recorded in TAP, TZX, TRD or SCL format is enabled by default on the ZXT console. This means that when you select a game in any of these formats, it will launch automatically without requiring any additional steps.
However, if you disable this option, the ZX Spectrum will start from the ROM instead. In this case, depending on the type of computer and ROM being used, you may need to manually enter the loading command for the game to start.
Enabling the automatic launch option provides a more streamlined and convenient experience, as the console handles the loading and launching of games automatically.

The option is designed to work seamlessly with both the embedded SE Basic ROM and the original ROMs stored on the SD card. It is specifically tailored to these ROM configurations.
If you decide to use alternative ROMs, it's important to note that the automatic game launch option may not function properly. Compatibility issues can arise when the console is expecting specific ROM configurations.

Some demos and games require the ZX Spectrum 128K to operate in **USR 0 mode** for proper functionality. In this mode, the Spectrum pages in the 48K ROM, making the system behave like it's in 48K mode, but with access to the page register and the ability to use AY sound.

This mode can be enabled via an additional option USR0. When this option is activated, the program will start in USR 0 mode, ensuring compatibility with software that requires this specific configuration.

3.2.8.3. Autoload game configurations

In the settings menu under Save / Load, it is possible to save all the configuration settings for each individual game. By enabling this option before starting a game, ZXT will load a previously saved configuration specific to that game.

It is important to emphasise that when loading a game's saved configuration, certain settings such as this parameter, Master volume, Brightness, Title screen, and others will not be loaded. However, all other parameters will be. Those not saved individually for each game are marked with an asterisk in their description.

By allowing settings to be saved on a per-game basis, ZXT provides a convenient way to customise the experience for each game and streamline the gameplay setup.

3.2.8.4. Poke memory tool

Poking games is a method that allows users to modify aspects of a game, such as gaining extra or unlimited lives, altering enemy difficulty, or skipping levels. In the era of 8-bit computers, pokes were typically added in loaders that executed them immediately after the game was loaded. With this tool, however, there's no need to modify loaders; pokes can be applied directly from the console's GUI.

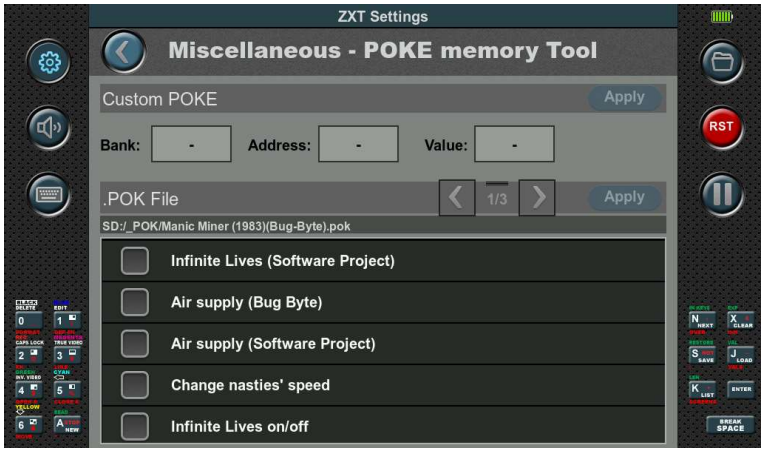

Figure 17.

There are two ways to use it: manually (Custom POKE) by entering the bank, address, and value, or by using pre-made .pok files from the SD card. Since pre-made .pok files are available for many games, this method is more convenient.

To use a. .pok file, first launch the file from the SD card by simply tapping on it in the file list. Then, when you open the tool, a list of all available pokes will appear on the screen. You can mark which pokes from the list you want to apply and then press the "Apply" button. This, of course, is done after the game has already been loaded and at the appropriate point in the game.

For pokes that require input (such as setting the number of lives), an edit box will be provided on the list where you can enter the desired value before pressing "Apply."

Additionally, .pok files can be integrated into ZTG files using the ZTG tool. This allows for automatic loading of the corresponding .pok file when a game is launched.

3.2.8.5. Autoload POK file

If this option is enabled, when a game is launched from the SD card, the corresponding. .POK file is automatically loaded as well. The name of the POK file must match the name of the game being launched.

3.2.8.6. Game Rewind

When enabled, this feature allows players to rewind gameplay after pausing. Once you pause the game, a green text label appears on the right side of the screen showing **REW: 0s**. Using the left and right buttons on the left D-pad, you can go back in time, and the label will update to **REW: xs**, where **x** represents the number of seconds you have rewound. After pressing play, the game resumes from the chosen point in the past.
Additionally, you can adjust the maximum duration the console can "remember" the gameplay in the past, which can be set anywhere between 9 and 62 seconds. Increasing this value makes the rewind steps larger, while decreasing it allows for finer, shorter steps. This provides a trade-off between the precision of rewinding and how far back you can go.
This feature is especially useful for undoing mistakes. If, for example, you lose a life in the game, you can rewind a few seconds and try again with a different approach.

3.2.8.7. Turbo mode (CPU clock = 7Mhz)

Turbo Mode enhances the ZX Touch by doubling the CPU speed to 7MHz from the standard 3.5MHz while keeping the ULA interrupt at a constant 50Hz. This mode is designed to support specific games that can detect and adapt to the increased speed, potentially enhancing graphics without altering the AY music, driven by the interrupt. This is similar to the turbo mode found in Pentagon computers—a ZX Spectrum clone capable of running many compatible games. Turbo Mode can be particularly useful for games designed to leverage faster processing speeds for an improved gameplay experience.

3.2.8.8. Double emulation speed (200%)

Double Emulation Speed Mode offers a unique enhancement by doubling the entire emulation speed. In this mode, the CPU operates at 7MHz, and the ULA interrupt frequency is increased to 100Hz, accelerating all aspects of the game, including gameplay and music. This mode provides a faster gaming experience, suitable for users looking for speed and efficiency in game progression. It can be a dynamic way to experience games, giving them a new feel and faster pace that differs from the traditional ZX Spectrum emulation.

3.2.8.9. WiFi Connection and Services

WiFi functionality is available in the **Miscellaneous** menu, where it can be enabled or disabled. When enabled, additional configuration options become available by pressing the **Set** button, which opens the WiFi Connection dialogue (Figure 17a.).

Figure 17a.

Connecting to a WiFi Network

To connect to a wireless network, press the **Choose** button. This opens a list of available WiFi networks (Figure 17b).

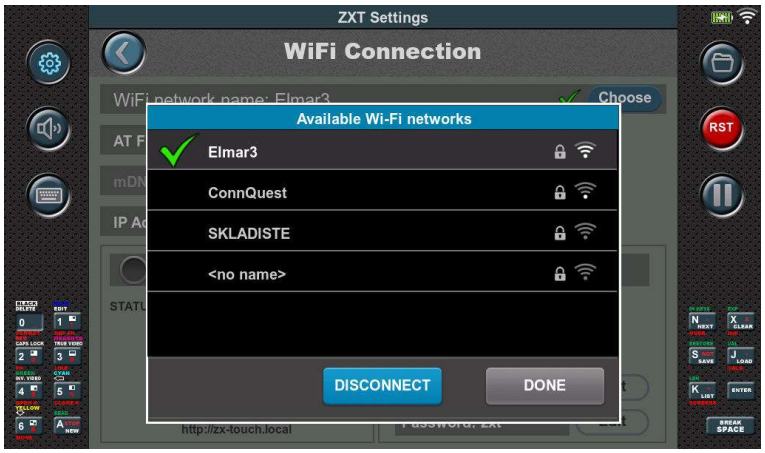

Figure 17b.

Networks detected in the surrounding area are displayed in the list. Selecting a network behaves as follows:

- If connecting to a network for the first time, a password (key) entry dialogue is shown
- After entering the correct password, the network is saved and marked with a **green check icon**
- Networks that have already been used are highlighted and can be selected without entering the password again

Depending on the current state, different actions are available at the bottom of the dialogue:

- **Join** – connects to the selected network
- **Disconnect** – disconnects from the currently active network
- **Forget** – removes saved network credentials

This behaviour follows standard WiFi connection logic found on most devices.

WiFi Module Firmware Update

Devices updated from firmware version 1.13 may contain an older version of the WiFi module firmware (version **2.2.0.0**).
While most features are available in this version, it is recommended to update to a newer version for improved performance and additional functionality.
To update the WiFi module, press the **Update** button. A confirmation dialogue will appear with important instructions.
Before starting the update:

- ensure the battery level is above 50% or connect the charger
- do not turn off the console during the update process

The update process takes approximately 2–3 minutes. After completion, a confirmation message is displayed.

The current recommended version is **4.1.1.0**, which provides improved data transfer speed and additional features.

mDNS Support

When using WiFi module firmware version 4.1.1.0, the **mDNS** option becomes available.
In a typical network, the router assigns an IP address to the console. This address can change over time, especially after reconnecting to the network. When accessing the console using the IP address, it may therefore be necessary to check the current address each time.
mDNS removes this dependency on IP addresses. When enabled, the console can always be accessed using a fixed hostname (for example: `zx-touch.local`), regardless of which IP address has been assigned.

- mDNS can be enabled or disabled using the toggle button
- the hostname can be modified using the **Edit** button

This provides a more convenient and reliable way to access network services.

Available Services

Two network services are available:

- **Web File Manager**
- **FTP Server**

Only one of these services can be active at a time.

Web File Manager

Web File Manager provides access to the SD card through a web browser.

- The access address is displayed as a URL
- A **QR code** is also provided for quick access from mobile devices

The QR code is intended for use with smartphones or tablets. By scanning the code with the device camera, the browser is automatically opened with the correct address.
The service can be accessed using either:

- the IP address
- or the mDNS hostname (if enabled)

Web File Manager allows:

- file upload and download
- file deletion
- renaming files
- creating folders

This makes it possible to manage SD card content directly from a computer or mobile device.
For mobile use, the simplest method is to create a direct connection:

1. enable the **hotspot** on the mobile device
2. connect ZX Touch to that network

This creates a local network between the mobile device and the console, allowing Web File Manager to be used without an external router.

FTP Server

The FTP Server allows file transfer using an FTP client application.
To connect, the client must use:

- the displayed IP address or hostname
- **username and password**, which can be edited using the **Edit** buttons

Important limitations and requirements:

- only **one connection at a time** is supported
- if the FTP client allows multiple connections, it must be limited to a single connection

The server supports only **active (PORT) mode**.

- passive mode (PASV) is **not supported**
- the FTP client must be configured to use active mode

Most FTP clients support these settings, including:

- FileZilla
- WinSCP

Some file managers, such as **Total Commander**, also provide FTP support and may offer a more convenient way to work with files, as local and remote files can be managed in the same interface. The built-in Windows FTP connection (mapped as a network drive) is **not recommended**, as it typically opens multiple simultaneous connections, which this server does not support.

3.2.9. Save / Load

Selecting the Save / Load icon will display the view as shown in Figure 18.

Figure 18.

On this screen, you can save configurations in different ways.
At the top, there is a round button with a house icon that allows you to return all settings to the factory defaults.
There are four memory slots available for configurations. The first slot, "default," is special as it loads the configuration saved in it when the ZXT is turned on. The other three slots serve as storage for frequently used configurations.

Each memory slot has "Save" and "Load" buttons for saving and loading configurations.

You can also save configurations specific to each individual game. The "Save current game settings" and "Load current game settings" buttons refer to the currently running game. The configuration is saved on the SD card in the same location as the game, with a different file extension.

For built-in games, the configurations are saved in the "ZXT_SYSTEM_TEMP" directory on the SD card's root. Make sure this directory exists; otherwise, the save/load operation will fail.

These saving options provide convenient management and restoration of settings for different scenarios and games.

3.2.10. Snapshot

The Snapshot feature on the ZX Touch enables players to save the game state at any point, using Z80 or SNA formats. This capability is especially beneficial for games with custom loaders or those stored as TZX files, which typically require more time to load. By saving a snapshot after the initial load, players can bypass these lengthy loading times in future sessions, resuming gameplay instantly.
This option is also useful for continuing a game on another platform, and it provides a solution when the three memory slots designated for each game are insufficient.

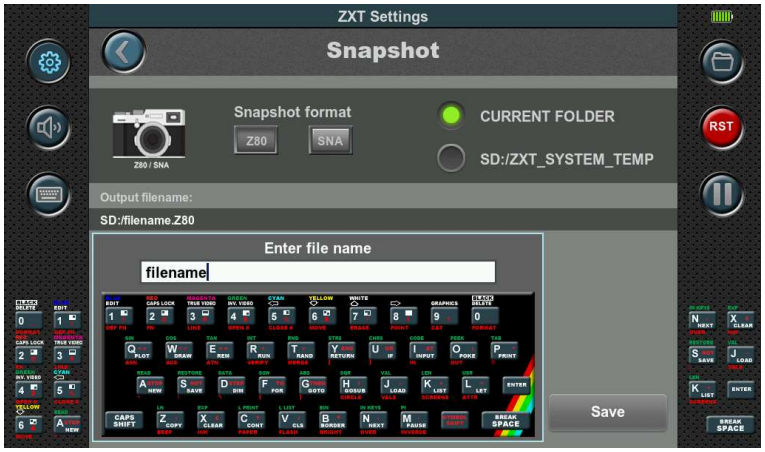

Figure 19.

When creating a snapshot on the ZX Touch, players begin by selecting the storage location for the file, which can be either the current directory for quick access or a predefined temporary directory, depending on their preference for file organisation. After setting the location, players can name the snapshot file using the virtual keyboard. The full path for the file's storage is displayed on the screen, helping to ensure that snapshots are not only well-organised but also easily accessible regardless of the chosen directory.

3.3. User Dashboards and Games Library

3.3.1. Introduction

Built-in games are showcased on the primary **Dashboard** through **Title images** accompanied by their corresponding **Title** (name). Upon selecting a game, an **Info image** is presented, offering supplementary details about the chosen game.
Players can initiate the game by touching the Start button, or alternatively, return to the main dashboard by selecting the Cancel button.
This concept can be extended to all games stored on your SD card, enabling the creation of new Dashboards capable of accommodating up to 50 games each.
To facilitate this, a novel file format named ".ZTG" (ZX Touch Game) has been introduced. Alongside encapsulating the game in its original format (TAP, TZX, SNA, Z80, TRD, SCL), the ".ZTG" file incorporates additional metadata concerning the game. This includes the Title image and Title (name) for dashboard display, as well as the Info image, info text, poke file, background images and ZXT configuration. This encapsulation format enables the inclusion of supplementary meta blocks, essential for forthcoming ZXT functionalities. The format's structure, composed of independent blocks that may or may not be present within the file, ensures seamless compatibility with upcoming iterations.
The process of creating ".ZTG" files is straightforward and can be executed entirely within the console itself, courtesy of the integrated conversion tool within the ZXT game browser. Once converted, games are automatically placed in the Games Library, which is located on the SD card at `SD:/ZXT_SYSTEM/LIBRARY` or in a local folder.
Games stored within the Games Library can then be organised onto Dashboards. Each Dashboard, represented by a separate file such as Dashboard1.dsh, Dashboard2.dsh, and so forth, is stored within the SD card directory at SD:/ZXT_SYSTEM/Dashboards. These Dashboard files contain references to the ".ZTG" games from the Games Library, along with their respective layouts.
Everything related to the Games Library and user-generated Dashboards are stored exclusively on the SD card within the SD:/ZXT_SYSTEM folder; none of this data is retained within the console itself. Consequently, by simply swapping the SD card, users can effortlessly adopt a completely new dashboard configuration. There's no need to manually create the SD:/ZXT_SYSTEM folder or its subfolders, as they are automatically generated when utilising these functionalities.

3.3.2. Managing dashboards

3.3.2.1. Creating and navigating dashboards

To create a new dashboard, simply press and hold any empty space within the current dashboard. A small progress bar will appear just above the touchpoint, indicating the required duration for the hold. Once the progress bar is filled, a **dashboard menu** will appear, offering various options depending on the context. If you're creating your first dashboard, which also means you're currently on the primary dashboard, you'll see only one option: "New dashboard," alongside the "Exit" option. Additionally, the menu can be closed by tapping outside its boundaries, and it can be moved by grabbing its title and dragging it around.

Figure 20.

Upon selecting the "New dashboard" option, a fresh empty dashboard is generated, featuring only one icon—a familiar entry point to the SD card contents. This process can be repeated to create additional dashboards. An indicator emerges in the upper right corner of the Games Browser, displaying the current dashboard number out of the total. The primary dashboard is labelled as '0' while subsequent dashboards are sequentially numbered as '1', '2', '3' and so forth.
Navigation between dashboards is facilitated by buttons located on the left and right sides. Alternatively, users can navigate using a joystick or the left d-pad.

3.3.2.2. Removing and dashboard rearrangement

Just like creating a new dashboard, deleting one is also possible. However, the "Delete dashboard" option in the menu only functions when the dashboard is empty. Confirmation is required by pressing the 'Yes' button, which appears alongside a message at the bottom of the screen.
Dashboards aren't fixed in order; they can be rearranged. This can be accomplished by selecting the "Move Left" or "Move Right" options in the menu whenever applicable.
The primary dashboard labelled as '0', which contains built-in games, cannot be deleted or moved.

3.3.2.3. Adding games to the dashboard

The "Add game" option is utilised to place games onto the dashboard that have been previously saved in the Games Library as ZTG files. Upon selecting this option, the contents of the Games Library are automatically displayed. Additionally, the chosen game from the Game Library is positioned at the end of the list. Alternatively, we can also add the game to the dashboard using the copy/paste functionality. This allows us to duplicate it from any dashboard, including the primary one labelled with '0'.

In the same way as the dashboard menu is opened (by pressing and holding on an empty space on the dashboard), the **game menu** can also be opened by pressing and holding on the title image of the game. If this is done on the built-in game on the primary dashboard, in addition to the options for "Exit" and "Start Game," the option "Copy" is offered. With this option, the game is saved to the clipboard, and it can be copied to any user dashboard using the "Paste" option in the dashboard menu. This copy/paste functionality can also be applied to games placed on user dashboards from the Games Library.

Figure 21.

3.3.2.4. Removing games from the dashboard

Removing the game from the dashboard is achieved with the "Delete" option in the game menu. After selecting this option, the console indicates the selected game by flashing its title image. At the same time, a message is displayed on the screen that must be confirmed in order to actually delete the game. When a game is deleted from the dashboard, it does not mean that it is deleted from the Games Library. How the game is deleted from the Games Library will be explained in the next chapter.

3.3.2.5. Repositioning games within the dashboard

When adding a new game to the dashboard, it is automatically placed at the end of the list. However, this default order may not always be suitable. To customise the arrangement of games, you can use the "Move" option in the games menu. Upon selecting this option, the console highlights the chosen game by flashing its title image. The subsequent step involves selecting the desired location for the game. This is accomplished by tapping on the game located exactly where we want to place the selected game. Once we choose the location, the game is then positioned accordingly, causing all other games to shift forward by one place. Should you decide to cancel the movement, you can simply select the "Cancel" button, conveniently located at the bottom of the screen along with the prompt.

3.3.2.6. Assigning Names to User Dashboards

You can assign names to custom dashboards, which helps to better organise and navigate your game collections. To name a dashboard, press and hold your finger on an empty space for a few seconds until a menu appears. In the menu, select the "Name" option. This will bring up the keyboard, allowing you to rename the dashboard. The new name will automatically appear at the top of the dashboard and be saved to the dashboard file on the SD card.

3.3.2.7. Hiding the First Icon on User Dashboards

On custom dashboards, the first icon, which provides access to SD card content, is always shown by default. If you prefer to hide this icon, press and hold your finger on an empty space on the dashboard until a menu appears. Then, select the "Hide 1st icon" option. To bring the icon back, follow the same process and choose "Show 1st icon" from the menu.

3.3.3. Adding games to Games Library (Creating ZTG files)

To add a game to the dashboard, it needs to be converted to ZTG format and then stored in the Games Library. ZXT provides a user-friendly tool for this purpose. Prior to conversion, it's advisable to adjust all necessary parameters in the ZXT configuration specific to the game, including physical key mapping, joystick settings, ROM options, ULAplus, and others.

Once the configuration is set, locate the game file on the SD card and press and hold the file name box, as illustrated in the image below. Once the progress bar completes, the file menu will be displayed.

Figure 22.

The option "Add to Library" triggers the opening of the conversion tool.

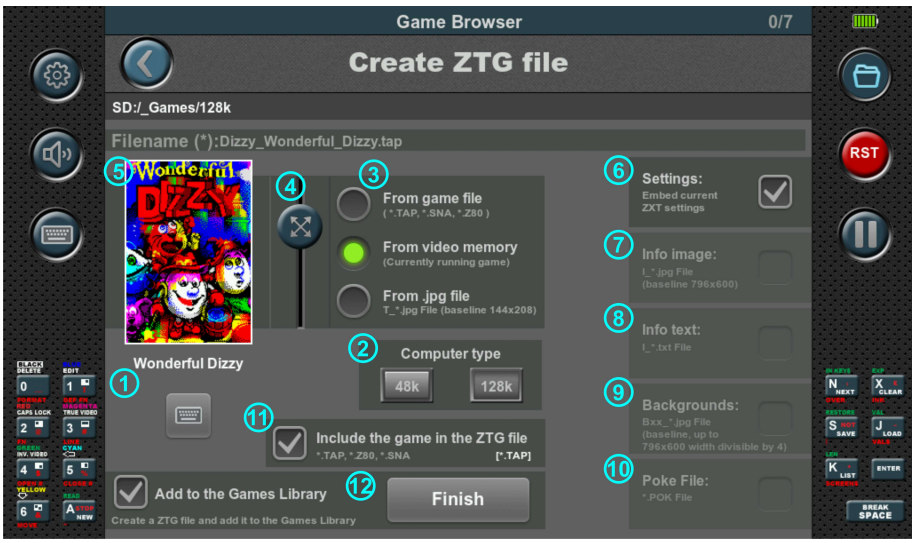

Figure 23.

Using this simple yet effective tool, we're able to enrich the selected file (.TAP,.TZX, .SNA, .Z80, .TRD, .SCL) with essential metadata, like Title, Title image, Info image, Info Text, Backgrounds, poke file, and ZXT configuration. It effortlessly combines these elements into a unified ZTG file, automatically adding it to our Games Library so it can be placed to Dashboard.

3.3.3.1. Title of the game

The title of the game (1), which will ultimately appear on the dashboard below the Title image, is displayed on the left side of the tool screen. By default, this title is set to match the name of the file (without the extension). To edit the title, press the keyboard icon, which will open a window with the edit box and keyboard. The CAPS SHIFT and SYMBOL SHIFT keys serve as toggle keys for easier typing. When CAPS SHIFT is active, keys 5 and 8 can be used to move the cursor, while the zero key deletes text to the left of the cursor.

3.3.3.2. Computer Type

In the 'Computer Type' section (2), you'll need to designate the type of computer the emulator will emulate for this game. Typically, in the ZXT console, the computer type parameter isn't included in settings saved under slots (default, slot1, etc.) or under 'Save current game settings.' Instead, it needs to be determined each time the game is launched from the SD card. However, in the ZTG file, this information is saved along with the entire current ZXT configuration.

3.3.3.3. Title image

When creating the Title image (5), you have three different options available in section (3).

- 'From game file'

If you select 'From game file', ZXT will attempt to extract an image from the selected file without launching the game. For .TAP files, it will search for a block the size of the ZX Spectrum screen and if there is any display it as an image within the frame. Snapshot files (.SNA, .Z80) always contain the screen content at the time the snapshot was taken. However, with TZX, TRD and SCL files, ZXT won't attempt to find such an image.

- 'From video memory'

By choosing the second option, 'From video memory', ZXT will capture the current image displayed on the emulator screen. This means that if you start the game before opening this tool and pause it on a suitable screen for the title image, that image will be displayed within the frame. Additionally, if you press the button with the folder icon to hide the Game Browser and proceed with the emulation, then press it again to return to the tool, a new image will be captured from the video memory of the emulator. This allows for seamless updating of the title image based on the current state of the game.

In both cases, 'From game file' and 'From video memory', you can adjust the image by zooming and repositioning it within the white frame. Zooming is controlled by the slider(4) on the right side of the Title image, and repositioning can be done by dragging the image within the frame. In the example shown, the title image is a zoomed and centred portion of the game's title image.

- 'From .jpg file'

We can achieve the best results by using the third option 'From .jpg file'. However, it requires a little more effort than the previous two.

This option uses a pre-prepared image that needs to be saved on the SD card in ".jpg" format. In order for the image to be successfully accepted, it must be in the defined resolution of **144x208** and in the **baseline JPEG format**, not in the progressive JPEG format.

Baseline JPEG format decompresses the image from top to bottom in a single pass, and the entire image cannot be displayed until it's fully loaded. On the other hand, progressive JPEG format enables gradual loading of the image. It starts with a low resolution and progressively adds details until the image is fully loaded. This allows users with slower internet connections to recognise the content of the image before it's completely loaded.

Although baseline is the basic and original format, many applications used for image processing save images in the progressive format by default. But it is also always possible to adjust to baseline JPEG format when saving the file.

To ensure that ZXT locates the '.jpg' file, it should be positioned in the same folder on the SD card as the game itself. Furthermore, the image's name must match the game's filename, with the addition of the prefix 'T_' and the file extension '.jpg'. For example, if the game file is named JSW.TAP, the corresponding image should be labelled as T_JSW.jpg.

3.3.3.4. Settings

On the right side of the tool screen is the Settings section(6). Here, a checkbox allows you to determine whether the current console configuration will be included in the ZTG file you are creating. If this option is enabled, the console will load the saved configuration each time the ZTG file is started. Conversely, if the configuration is disabled, the current setup will not be saved in the ZTG file, meaning that launching such a ZTG file will preserve the console’s configuration as it was at that moment. It is highly recommended to enable this option to ensure the game starts exactly as you have configured it.

3.3.3.5. Info image

If you wish for the Info screen to appear when starting the game from the dashboard, you need to check the Info image section (7). Upon opening the tool, it automatically checks for the corresponding '.jpg' file on the SD card, which should be located in the same folder as the game itself. If the file with the appropriate name does not exist, the entire section will be greyed out, and the checkbox cannot be selected. However, if the file is present, the section will be displayed normally, allowing the user to decide whether to include it.

When you check this option, ZXT will display the image on the screen. Upon confirming with the 'Confirm' button, the Info image will be included in the final ZTG file. Similar to the Title image, this JPEG file must be in baseline format and have a resolution of 796x600. Additionally, the image's name must match the game's filename, with the prefix 'I_' added and the file extension '.jpg'. For example, if the game file is named JSW.TAP, the corresponding image should be labelled as I_JSW.jpg.

3.3.3.6. Info text

The Info text section(8) allows users to include a text file that will be displayed alongside the game. If this block is included in the ZTG file, when starting the game, a "Story" button will appear on the

Info screen, where the image from the previous block is shown. By pressing this button, the user can read the provided text.

Upon opening the tool, it automatically checks for a text file with the same name as the game but with a '.txt' extension. If the file does not exist, the section will be greyed out, and the checkbox cannot be selected. If the file is found, the section is enabled, and by checking the box, a text viewer will open, allowing the user to preview how the text will appear.

When viewing text files, the first line, followed by an empty line, will be treated as a title and displayed in a larger, bold font for better readability.

3.3.3.7. Backgrounds

In this section(9), the user can include blocks that contain background images. More details on background images can be found in **section 3.2.1.12.4 Display - In game backgrounds** of this user manual, and it is recommended to read it before using this option. The maximum number of background images is 100. The filenames must match the name of the game file but with the prefix "Bxx_", where xx is a two-digit number ranging from 00 to 99. For example, if you are creating a ZTG file from the game JSW.tap, the first background image should be named B00_JSW.jpg, second B01_JSW.jpg and so on.

If no correctly named files are detected upon entering the tool, this option will be greyed out. However, if valid files are found, checking the box will open the image viewer, which displays the images in full size as they will appear on the emulation screen. In the upper-left corner, file name and information about the image resolution is displayed. The left and right buttons allow the user to scroll through all the files that will be included. Pressing the Confirm button finalises the inclusion of these blocks in the ZTG file.

3.3.3.8. POKE File

Information about .pok files and their purpose can be found in **section 3.2.8.4 Miscellaneous - Poke Memory Tool** of this user manual. If a .pok file with a name matching the game's filename is present when creating the ZTG file, this section(10) will be active. Otherwise, it will appear greyed out. When the checkbox is selected, the file will be opened in a text format for review. If this block is included in the ZTG file, the .pok file will automatically load when the ZTG file is launched, and it will be available for use within the Poke Memory Tool.

3.3.3.9. Include the game in ZTG file

In this section(11), you can choose whether the game itself will be included in the ZTG file. If you disable this option, the game for which you are creating the ZTG file will not be embedded, and launching such a ZTG file will result in an on-screen message indicating that the game code is missing.

The option to exclude the game code has been introduced to avoid copyright issues when sharing ZTG files between users. For instance, if you want to share a prepared file, simply exclude the game code, allowing users who legally own the game to add it to the ZTG file themselves. This way, the recipient gets a ZTG file that already contains all artwork, settings, and the poke file, making the preparation much easier. Adding the game code becomes a simple step, done later using the “Edit ZTG file” option, which further simplifies the process.

3.3.3.10. Add to Games Library / Finish

Before pressing the *Finish* button (12) to create the ZTG file, you need to select where the file will be saved. If the checkbox is selected, the file will be created directly in the *Games Library,* making it immediately available for placement on the Dashboard. If the checkbox is not checked, the file will be created in a local folder. You can later add such a file to the *Games Library* by using the *Add to library* option in the menu that appears when you hold your finger on the ZTG file, or you can copy it to `SD:/ZXT_SYSTEM/LIBRARY` using the copy/paste functions.

3.3.4. Editing ZTG Files

By holding your finger on the filename box of the ZTG file, a menu appears offering the option to **Edit**. Selecting this option opens the ZTG tool in edit mode, as it relates to a ZTG file rather than files with extensions such as .tap, .tzx .sna, .z80, .trd or .scl. This mode closely resembles the mode used for creating ZTG files, with the notable difference that next to each section (block) of the ZTG file, there is a toggle button. This button allows you to choose whether you want to keep a specific block as it currently exists in the ZTG file or replace it with a file located on the SD card. Similarly, the same applies to settings. You can either retain the settings from the ZTG file or embed the currently configured settings of the console.

Figure 24.

Using the checkbox, you can select whether or not to include that block in the ZTG file. If you choose to change a block but do not have correctly named files on the SD card, the entire section will become greyed out. You can also modify the game title in the same way as when creating a ZTG file. If you wish to retain the existing title image from the current file, none of the three options (From game file, From video memory, From .jpg file) should be selected. However, if you do select any of these options, you will have the ability to change the title image.
Pressing the **Finish** button will modify the selected file according to the changes you have configured.

Particularly, let’s focus on the situation where you have a ZTG file without game code. In this case, you need to have the game code in one of the four formats (.tap, .sna, .z80, or .trd) located in the same folder as the ZTG file, with an identical name as ZTG file. After opening the tool in edit mode, simply set the toggle button next to the section **Include the game in ZTG file** to **EXT** and check the corresponding checkbox.
After pressing the **Finish** button, the game code you specified will be included in the ZTG file, making it functional.

4. Firmware update:

Like many devices, the firmware of the ZXT console is a continuous work in progress, with ongoing improvements and bug fixes. To ensure the console remains up to date and functioning optimally, easy and straightforward firmware updates are crucial.

Updating the firmware is a straightforward process facilitated by a dedicated application built into the ZXT as an independent software module. This design allows for seamless updates and provides a fail-safe mechanism in case of unsuccessful or partial updates.

The firmware update application, known as the **Firmware Update Tool** (**FUT**), can be accessed using the following procedure: **Press and hold all eight buttons simultaneously, then power on the console**. This action triggers the built-in BIOS to launch the FUT instead of the regular ZXT firmware.
The FUT can be updated as well. This process is handled by the built-in BIOS. If, before launching the FUT, the BIOS detects the presence of the correct file(s) with the ".efu" extension in the "_H7_Autoboot_" directory on the SD card, it will automatically write and update these files without requiring any user interaction. This allows for simultaneous updates of both the ZXT firmware and the FUT, ensuring they stay up-to-date and synchronised.

NOTE: *Although the main ZX Touch firmware supports both FAT32 and exFAT SD cards, all firmware update procedures currently require a FAT32 formatted SD card.*

4.1. Firmware Update Tool (FUT)

After the BIOS starts the FUT, the following is displayed:

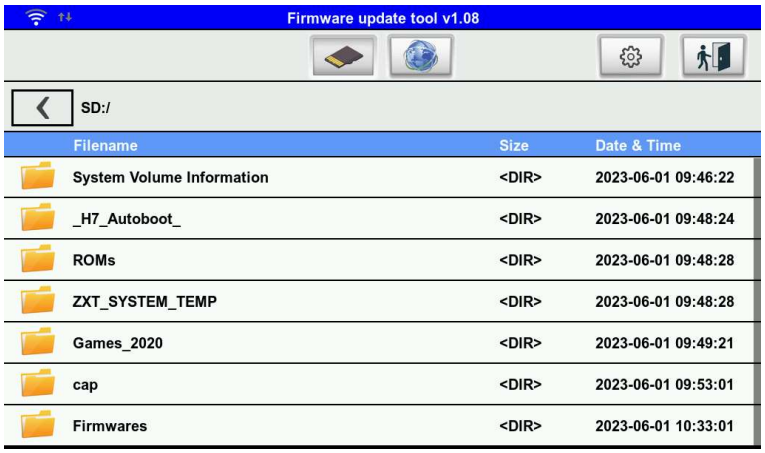

Figure 25.

The FUT provides two options for accessing the .efu file: getting it from the SD card or downloading it directly from zxt.efu-server.com using a WiFi connection to the Internet. At the top of the screen, there are two buttons that allow you to select between these two modes.

4.1.1. Updating from SD card

In the figure 25, the SD card option is selected. This displays the contents of the SD card, showing only directories and .efu files. Other file formats are not displayed. Navigation within the file list is done in the same way as in the Game browser. Once a file is selected, the subsequent screen is displayed.

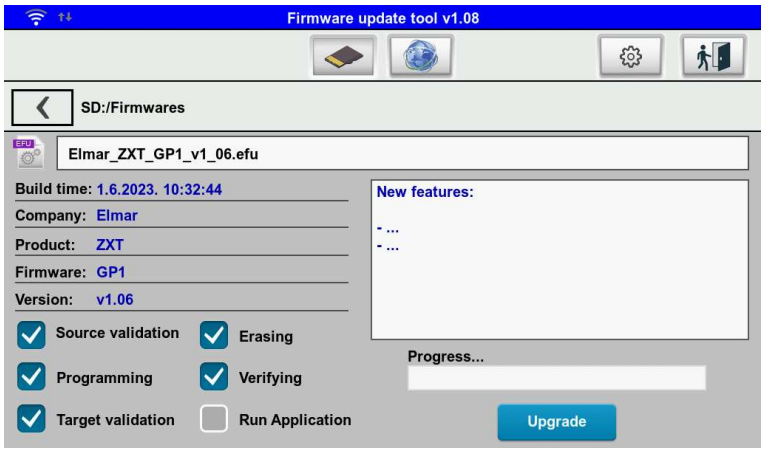

Figure 26.

On the left side of the screen, you will find basic information about the firmware, while the white window on the right side additional information may appear which is saved in the .efu firmware file

The options below do not require any adjustments, and it is recommended to leave them as they were read by the Firmware Update Tool from the .efu file. The last option, "Run Application," allows you to set whether you want to start the ZXT console immediately after the update.
To initiate the firmware update, simply press the "Upgrade" button and wait for the message indicating that the update was successful.
The duration of the update process depends on the size of the firmware being installed. During the update, the progress is indicated by a progress bar, and it may take several minutes to complete the process. Just be patient and allow the update to finish without interrupting or powering off the ZXT console.

After the update is finished, you can exit the Firmware Update Tool by tapping the exit button located in the upper right corner or performing a power cycle. This will bring you back to the updated ZXT firmware.

4.1.2. Updating from internet

To update the firmware over the Internet, you need to connect to a WiFi network first. Tap on the wheel button located on the left side of the exit button to access the settings. The following screen will be displayed:

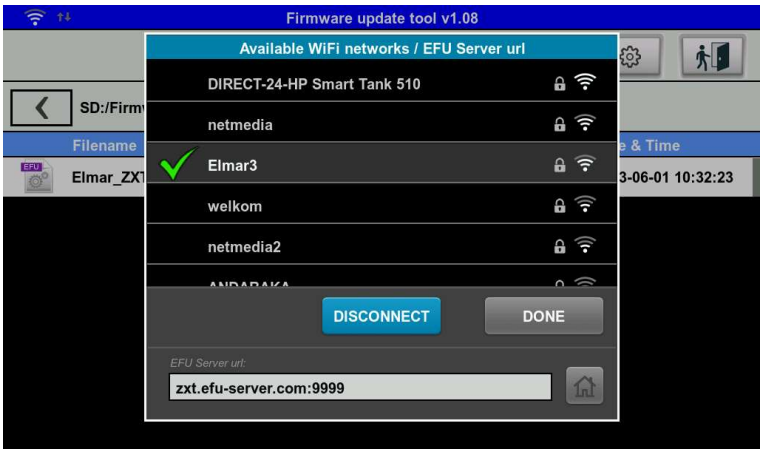

Figure 27.

The list displays all available networks in the area. Select your network from the list and tap "Connect." A keyboard will appear on the screen to enter the network password. After confirming and successfully connecting, a green tick mark will appear next to the network name. Once a network is used, it will be remembered, and you won't need to enter the password again. Remembered networks are indicated by an accented name. To forget a network that is not currently connected, use the "Forget" button.

NOTE: ZXT does not support 5G WiFi networks, only 2.4G WiFi networks.

After successfully connecting to the WiFi network, we can tap on the server access button located at the top in the middle, next to the SD card button.

Then, a list of efu files available on the Internet server is displayed on the screen. The subsequent procedure is identical to when we perform the update from the SD card.

Declaration of Conformity:

For the following equipment:

Product Name: ZX Spectrum handheld console
Model : ZXT-001
Manufacturer Name: ELMAR electronic d.o.o.
Manufacturer Address: Kopilica 5, 21000 Split, CROATIA

Normative documents:
EN 55032:2015+A1:2020+A11:2020
EN 55035:2017+A11:2020
RoHs – Directive 2011/65/EU

CE marking CE

Produced by:

Distributed by: