This article needs some TLC. Read at your own risk.

# Visual Pinball X

The Visual Pinball X is a pinball developed by Randy Davis. It was released in 2000.

This system scrapes metadata for the “vpinball” group(s) and loads the `vpinball` set from the currently selected theme, if available.

Batocera **v40** and higher will have all components of the emulated pinball machine (the table, the scoring DMD system, the backglass recreation, etc.) on the main display by default, however some components can be sent to additional real-world displays such as LED marquees.

Batocera **v39** and lower do not support multi-screen configurations of any kind.



### Quick reference

- **Emulator:** vpinball standalone
- **Folder:** `/userdata/roms/vpinball`
- **Accepted ROM formats:** `.vpx`

## BIOS

No Visual Pinball X emulator in Batocera needs a BIOS file to run.

# ROMs

The current version of Visual Pinball supports version 10 (`.vpx` extension) tables.

Community based tables for can be downloaded from https://www.vpforums.org or https://vpuniverse.com

Place your VPX tables in the `.vpx` format in `/userdata/roms/vpinball/<table_name>/` (eg. `/userdata/roms/vpinball/Haunted House (Gottlieb 1982)/Haunted House (Gottlieb 1982) VPW 2.1.vpx`)

## PinMAME

Many historical tables require the original ROM file extracted from the pinball machine mainboard to run. To play these tables, put the proper ROM in `.zip` format in `/userdata/roms/vpinball/<table_name>/roms` (eg. `/userdata/roms/vpinball/Phantom Of The Opera (Data East 1990)/roms/poto_a32.zip`). A few tables also require a nvram `.nv` file placed in `/userdata/roms/vpinball/<table_name>/nvram`.

In Batocera **v38** and lower, these paths were instead `/userdata/system/configs/vpinball/pinmame/roms` and `/userdata/system/configs/vpinball/pinmame/nvram`

## Additional .vbs files

Visual Pinball uses VBScript (VBS) as the scripting engine for tables. Due to incomplete support in Wine, some tables will fail to run without modification.

These tables may run with a modified VBS file which can be found at https://github.com/jsm174/vpx-standalone-scripts

Put the `.vbs` file in `/userdata/roms/vpinball/<table_name>`, next to the VPX table. Only the `.vbs` file is required (not the `.vbs.original`, nor the `.vbs.patch` files). The name must match the exact name of the table (eg. `/userdata/roms/vpinball/Guns N Roses (Data East 1994)/Guns N Roses (Data East 1994) VPW v1.1.vbs`)

# All Paths

## Per Table folder organisation (V39+)

Virtual Pinball is very flexible and provides support for alternative, optional features (alternate sound effects, colorized Dot Matrix Displays, etc) that may be separate from the main table download. These

features are contained in files that are separate downloads and best organized in separate folders within that for the table. The recommended folder organization for use within Batocera **v39+** is shown below.

| Folder | Description |
|---|---|
| /userdata/roms/vpinball/<table_name> | The VPX and any associated `.directb2s` or `.vbs` files. Any associated `.UltraDMD` folders should also be in this folder. Note: All file names (`.directb2s`, `.vbs`) should match the `.vpx` file name exactly. |
| /userdata/roms/vpinball/<table_name>/roms | The PinMAME ROM of the table (in `.zip` format). (eg: `userdata/roms/vpinball/AC-DC LUCI Premium (Stern 2013)/roms/acd_170h.zip`). You will need to create this directory for those tables that require ROMs as they are a separate download from the table itself. Alternatively, you can put all your PinMAME ROMs in the PinMAME directory as described here. |
| /userdata/roms/vpinball/<table_name>/altcolor | Optional Serum colorizations directory <rom_name>/<rom.cRZ> (eg: `userdata/roms/vpinball/AC-DC LUCI Premium (Stern 2013)/altcolor/acd_170h/acd_170h.cRZ`). Create this directory as needed. Note that VP Standalone only supports the Serum (.crz) colorization format. Other colorization formats (.pac, .vni, etc) are closed source and not supported. |
| /userdata/roms/vpinball/<table_name>/altsound | Optional alternative sound packages directory <rom_name>/<sound files> (eg: `userdata/roms/vpinball/Batman (Data East 1991)/altsound/btmn_106`). Create this directory as needed. |
| /userdata/roms/vpinball/<table_name>/music | The table's music files, if any. Create this directory for those tables where a separate download for the music files is required (e.g. `Halloween 1978-1981 (Original 2022) 1.03.vpx`) |
| /userdata/roms/vpinball/<table_name>/nvram | PinMAME NVRAM (Fix Me! description) |
| /userdata/roms/vpinball/<table_name>/pupvideos | Pup Pack directory <rom_name> (eg: `userdata/roms/vpinball/Tron Legacy (Stern 2011)/pupvideos/trn_174h`). You will need to create this directory if the Pup Pack is a separate download and not included with the table itself. |
| /userdata/system/configs/vpinball | This directory is created automatically by Batocera for the `VPinballX.ini` configuration file and associated log files. If you have a problem getting a table to run, check the `vpinball.log` file in this directory. |

## V38

| Folder | Description |
|---|---|
| /userdata/roms/vpinball | Your .vpx & and any associated .directb2s or .vbs files. Any associated .UltraDMD folders should also be in the vpinball roms folders. Note: .directb2s files should match the .vpx file name. |
| /userdata/system/configs/vpinball | VPinball configuration and log files |
| /userdata/system/configs/vpinball/user | VPinball user directory |
| /userdata/system/configs/vpinball/pinmame | VPinball generated PinMAME settings, eg. sound, cheat, dmd_red |
| /userdata/system/configs/vpinball/pinmame/roms | PinMAME ROMs directory |
| /userdata/system/configs/vpinball/pinmame/nvram | PinMAME NVRAM directory |
| /userdata/system/configs/vpinball/pinmame/altcolor | Serum colorizations directory <rom_name>/<rom.cRZ> (ex: trn_174h/trn_174h.cRZ for Tron Legacy) |
| /userdata/system/configs/vpinball/pinmame/altsound | Alternative sound packages directory <rom_name>/<sound files> (ex: stwr_107 for the Data East Star Wars table) |
| /userdata/system/configs/vpinball/pinmame/vpinball | VPinball PinMAME settings directory |
| /userdata/system/configs/vpinball/music | VPinball music directory, put your music here, or in the same folder as your vpx file in it's own 'music' folder. The music folder, should be lowercase - i.e. /userdata/roms/vpinball/Kiss/music |

In Batocera **v39** and lower, the default configuration does not allow for using subfolders in `/userdata/roms/vpinball/` to store and run pinball tables. This can be changed by editing the line in `/userdata/system/configs/vpinball/VPinballX.ini` from `PinMAMEPath =` to `PinMAMEPath = ./`

In Batocera **v40** and higher, this is the default.

# Emulators

## Visual Pinball Standalone

Visual Pinball Standalone is a modified version of VPinballX that is designed to run on non-Windows platforms. It is an open source cross-platform pinball table simulator that targets not only Desktop users but Pincab users as well. Standalone is not currently as full-featured as its Windows counterpart (it does not include the table editor nor does it support head tracking, for example) but the features it has are enough to support a dedicated cabinet. Standalone is also in active development and new functionality is being added on a regular basis.

### Visual Pinball configuration

Standardized features available to all cores of this emulator: `vpinball.videomode`, `vpinball.padtokeyboard`, `vpinball.videomode`, `vpinball.bezel`,

`vpinball.bezel_stretch`, `vpinball.hud`, `vpinball.hud_corner`, `vpinball.bezel.tattoo`, `vpinball.bezel.tattoo_corner`, `vpinball.bezel.tattoo_file`, `vpinball.bezel.resize_tattoo`

### Accessing Service Menu

Due to the extreme variety of hardware, no generic procedure exists to change the volume or the number of balls. But an excellent topic on this subject is here: https://www.vpforums.org/index.php?showtopic=38669#entry388038

For non DMD tables, the options are configured through Dip switches. Vpinball standalone version doesn't support pressing `[F6]` to display a window with the options. The DIP switche values must be changed by editing the `.vbs` file. eg. In the Fathom table, you can have 5 balls per play instead of 3 by changing this part:

```
' Number of Balls / game
    SetDip &H40000000,1        'Number of balls.  0,0 = 3, 0,1 = 3, 1,0 = 5, 1,1 = 5
    SetDip &H80000000,0
```

More information on what each Dip switch does is found in the table's user manual.

## Customizing the Table

### Visual Settings

Default controls example should include the Batocera retropad's controls.

#### Change the Point of View and Lighting

1. Press `Esc` then choose `Adjust Camera`
2. Use:
    1. Flippers (shift keys by default) to increase/decrease value
    2. Magnasaves (ctrl keys by default) to select previous/next item
    3. Credit (5 key by default) to reset to table's defaults
    4. Start (1 key by default) to save your changes in an pov file

In v38, this creates a `.pov` file next to your table `.vpx` file, with the same name (in `/userdata/roms/vpinball`). Note that `Environment Emission` is not saved in this `.pov` file and must be set in your table's `.ini` file

The `.pov` files are deprecated in **v39**. The customization process remains exactly the same (press `Esc` then choose `Adjust Camera`), but it now creates a `.ini` file. It's recommended to remove the old `.pov` files to use the new `.ini` files, and also to choose the `Camera` view instead of the `Legacy` view. (Fix Me! is this **required** or **optional**?)

#### Display a ball trail (to better see it)

Options should be listed and described in the appropriate emulator's config section

It'll help keep track of your ball in fast moments or with dark tables.

- **v38**: in the `VPinballX.ini` file, put these values

```
[Player]
; Ball options
BallTrail = 1
BallTrailStrength = 0.8
```

- **v39**: you can configure this directly in the Advanced Options of the emulator

#### Reduce the visual nudge effect

This setting won't change the real nudge intensity, just the visual effect. If you want a more subtle visual effect when nudging:

- **v38**: in the `VPinballX.ini` file, put these values:

```
[Player]
; Visual nudge strength
NudgeStrength = 0.01
```

- **v39**: you can configure this directly in the Advanced Options of the emulator

## Customize Sounds

#### Change the Sound Volumes

1. If a particular table has a low music volume, you should first check if the volume is adjustable by accessing its service menu (or try pressing 8, or 9, or 7). Note that for some tables, it'll be impossible to adjust it.
2. If you want to balance the volumes between mechanical sounds of music sounds, you can do it globally (by editing the `VPinballX.ini` file), or on a table basis (by editing the table's `.ini` file, located next to its `.vpx`). Look for this section:

```
[Player]
MusicVolume = 100
SoundVolume = 5
```

- **v39+**: you can also configure this directly in the Advanced Options of the emulator

#### Altsound packages

(starting in v39 of Batocera)

The sounds included in the rom can be totally replaced. You can find some packages at https://vpuniverse.com/files/category/113-altsound/ or http://altsound.vpin24.com/

1. Download the `.zip` file
2. Extract it in `/userdata/roms/vpinball/<table_folder>/pinmame/altsound/<rom_name>` (example: `/userdata/roms/vpinball/Guns_n_Roses_1994/altsound/gnr_300` for the Data East Guns N' Roses table)

Data East tables are notorious for having a very bad sound quality. You can find altsound packages which can be simply a better version of the original sounds, or a very different version.

## Use colored DMD

Only the Serum colorization system is supported (https://vpuniverse.com/files/category/173-serum-dmd-colorizations/) at the moment (with Batocera 39+)

1. Download the corresponding `.cRZ` file for the pinmame ROM and copy it into `/userdata/roms/vpinball/<table_folder>/pinmame/altcolor/<rom_name>/<rom.cRZ>` (ex: `/userdata/roms/vpinball/Tron_Legacy/pinmame/altcolor/trn_174h/trn_174h.cRZ` for Tron Legacy).
2. Check on jsm174's GitHub page if a pre-existing updated script for Serum colored DMD `.vbs.dmdcolored` file exists. If it does, you can download it and copy it into the table directory and **rename it with a `.vbs` extension**, letting it sit next to the `.vpx` file, with the same filename (ex: `/userdata/roms/vpinball/Tron_Legacy/Tron Legacy (Stern 2011) VPW Mod v1.1.vbs` (from the original `.vbs.dmdcolored` on jsm174's Github repo).
3. If no `.vbs.dmdcolored` script is available and the DMD is not colorized, you can try and set it by yourself:
    1. first, extract the `.vbs` script from the `.vpx` table file using a tool like the VPX-VBS extractor;
    2. In the `.vbs` file, replace the `UseVPMDMD` parameter by `UseVPMColoredDMD`;
    3. Save the table, and keep the same filename as the `.vpx` table, just with the extension changed to `.vbs`. It's not necessary to import the `.vbs` file back into the `.vpx` file, if a `.vbs` file exists in the folder, it takes priority.

## Have an animated Backglass (B2S)

Animated backglasses are files with `.directb2s` extension and should be placed next to your `.vpx` file. The support was added for **v39+**. The extension `.directb2s` must be lower case and the name has to be identical to your table's name (eg: `Transporter the Rescue (Midway 1989) VPW v1.05.directb2s` for `Transporter the Rescue (Midway 1989) VPW v1.05.vpx`).

## Have PUP Pack Animations on the Backglass

Preliminary support for PUP Pack Animations was introduced in Batocera **v40**. It is a work in progress at time of writing. Broken or missing functionality on some tables is expected.

If you want to activate PUP support, edit these settings in `VPinballX.ini`:

```
[Standalone]
B2SPlugins = 1
PUPCapture = 1
PUPPlugin = 1
```

Download the corresponding PUP Pack and copy it into `/userdata/roms/vpinball/<table_folder>/pupvideos/<rom_name>/` (eg: `/userdata/roms/vpinball/Lord of the Rings (Stern 2003)/pupvideos/lotr`).

The expected ratio for the backglass and the FullDMD are 16:9. For the topper, it's not strictly defined, so 4:1 ratio is a good starting point to start experimenting.

You need to be patient: don't expect everything to work as it's a WIP.

If it's not working as expected, you can check if you have the correct (ie: adapted to desktop or 2 screens, or 3 screens...) `playlists.pup`, `screens.pup` and `triggers.pup` files in `/userdata/roms/vpinball/<table_folder>/pupvideos/<rom_name>/`. Most of the time, you have a `PuP-Pack_Options` folder with some preconfigured ready-to-use files. Eg: for `Batman 66 Stern Tribute (2021)`, you need to replace the 3 .pup files in `/userdata/roms/vpinball/Batman 66 Stern Tribute (2021)/pupvideos/b66_orig/` by the ones from `/userdata/roms/vpinball/Batman 66 Stern Tribute (2021)/pupvideos/b66_orig/PuP-Pack_Options/Option 3 - Desktop`.

A few ideas if a puppack is not working:

- sometimes you need to activate it in the .vbs script (eg: the goonies table)
- make sure the folder “PupCapture” is spelled this way (this folder is currently case-sensitive, so it won't work if it's “PuPCapture” for example)

## I want to use Batocera for a Visual Pinball Cabinet

Starting with Batocera **v40**, Batocera supports running on a VPX-based pincab. Here are the configuration steps:

- First, define if you want the primary screen for ES to be the playfield or the backglass (assuming you have at least 2 screens for your pincab).
- Let's assume that you choose the backglass as the primary ES screen. Define its identifier and resolution in EmulationStation (**SYSTEM SETTINGS → VIDEO OUTPUT**). Don't keep the **AUTO** value (Fix Me! why?). If necessary, tweak the resolution in **SYSTEM SETTINGS → ADVANCED FRONTEND OPTIONS** (Fix Me! any specific reason outside of the usual reasons for wanting to adjust resolution?))
- Then, in **SYSTEM SETTINGS → MULTISCREEN** define the output for the secondary screen. In our example here, this would be the playfield for VPX, and the information screen for EmulationStation.
- For the DMD, you have two options:

    - Either use another screen for DMD, defined as the **DMD SCREEN** in this **MULTISCREEN** menu;
    - Or a physical LED-based DMD like a Pixelcade or a ZeDMD, configured it in **SYSTEM SETTINGS → DMD**.
- If you use a 3rd screen as the DMD, go to **SYSTEM SETTINGS → DMD** and set the server to **DMDSIMULATOR**. If you have a physical LED-based DMD, set this option to **DMDSERVER (FOR REAL DMDs)**.
- When you launch a VPX table, Batocera will try and detect which screen is the backglass, which screen is the playfield (independently from the selection that has been made for EmulationStation). If it gets inverted, you can swap the screens for the playfield and the backglass with the option **INVERSE PLAYFIELD AND B2S** in the advanced settings of Virtual Pinball.
- When using Batocera in a pincab, in the same advanced settings for the Virtual Pinball system, set the **PLAYFIELD MODE** to **FULLSCREEN**.
- If the playfield is not set up correctly, like it is in single-screen mode and not the right playfield view you expect, it can be fixed from the VPX menu:
    - Plug a keyboard to your Batocera machine and press **ESC** to enter the VPX menus
    - Go to **table options**, then **Page 2/3 Point of View**
    - Use left and right CTRL keys to browse the menu options, and use left and right SHIFT key to change values
    - Set **View layout mode** to **Window**.
    - Press the key 1 on your keyboard to save the setting.

As of now, not everything is supported in Batocera **v40**, but things move fast. In particular what is missing compared to traditional Windows-based pincabs:

- DOFlink to control toys (addressable LEDs, shakers…)
- SFF and multi-output sound systems

For earlier Batocera **v39** and lower, this is not supported. A pinball and Batocera fan shared information about how to tweak Batocera **v39** for pincabs at this location.

# Controls

## Keyboard Keys for Visual Pinball

| key | action |
|---|---|
| 1 | start game / add player |
| 2 | buy extraball at the end of the game (judge dredd, indiana jones tpa…) |
| 5 | insert coin 1 |
| 4 | insert coin 2 |
| Enter | launch ball |
| L Shift | left flipper |
| R Shift | right flipper |
| L Ctrl | left magna save |
| R Ctrl | right magna save |
| L Alt | lockbar fire button (ac/dc, terminator 2…) |
| Q | quit |

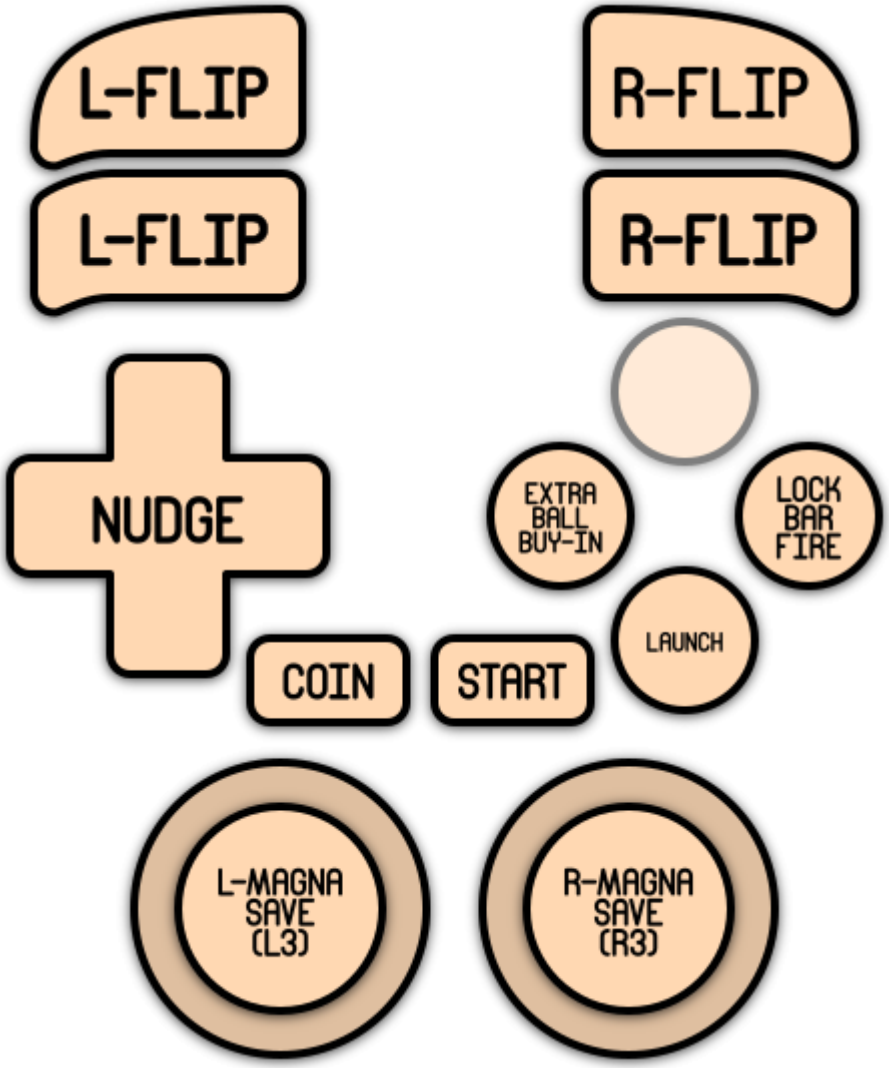
| key | action |
|---|---|
| T | mechanical tilt |
| Space | nudge forward |
| Z | nudge from left |
| / | nudge from right |
| Esc | contextual menu to pause emulator / launch webserver / adjust camera |
| F11 | display stats (press twice to have graphical stats) |

## Keyboard Keys for Stern S.A.M. Pinballs

Very useful to access and manipulate the service menu of the pinball, in order to change the volume, or the number of balls in play (and many other parameters)

| key | action |
|---|---|
| 3,4,5 | insert coin 1, 2 , 3 |
| 7 | back |
| 8 | minus |
| 9 | plus |
| 0 | select / access to the menus |
| home | slam tilt |

Here are the default Visual Pinball X's controls shown on a Batocera RetroPad:




## Customizing keyboard keys

These sections should be moved to https://wiki.batocera.org/remapping_controls_per_emulator

Example: you want to replace the `AddCreditKey` by `I` keypress:

- open the `/userdata/system/configs/vpinball/VPinballX.ini` file.
- In the `Keyboard input mappings` section, replace `AddCreditKey = 23`
- the keycodes are available here: https://github.com/vpinball/vpinball/tree/standalone/standalone#keyboard

## Customizing gamepad buttons

You should have a look at the Pad2Key system as modifications of `/userdata/system/configs/vpinball/VPinballX.ini` for the joystick are not taken into account.

In **v40+**, you can control the plunger with the right stick by editing your `VPinballX.ini`:

```
[Player]
; Plunger
PlungerAxis = 5
```

# Troubleshooting

The main log file is located in `/userdata/system/configs/vpinball/vpinball.log`

## The table opens briefly then closes

- Ensure the correct ROM file (in ZIP format) is present at `/userdata/system/configs/vpinball/pinmame/roms`.
- Some tables require the correct VBS file.

## My dmd is not showing

https://github.com/vpinball/vpinball/tree/standalone/standalone#my-game-is-not-displaying-a-dmd. The https://github.com/jsm174/vpx-standalone-scripts repository also has a bunch of files with a `.vbs.dmd` extension: they contain some hacks to display the DMD if you're playing on a single screen. Just rename the extension to `.vbs` and put this file next to your table (with the exact same name).

## I can't add coins

- some tables are configured after their first launch, try exiting and relaunching it again.
- some Bally and Gottlieb tables (gts3 type: cueball wizard for example) need a pre-initialized nvram to accept coins. You can get some files here https://www.vpforums.org/index.php?app=downloads&showfile=1362 and copy them to `/userdata/system/configs/vpinball/pinmame/roms`

## The table tilts on its own/the ball starts to behave in a crazy way

This should be an advanced system setting, considering how impactful it is.

Batocera may be unintentionally interpreting readings from your controller as that from an accelerometer, whether your controller has one (PS4 Dualshock) or not (XBox 360). Edit the file `/userdata/system/configs/vpinball/VPinballX.ini` to turn this off:

```
[Player]
; Nudge
PBWEnabled = 0
```

Note that you will still be able to nudge the table with the DPad even after this change.

## Performance Tips

Press F11 to display the FPS.

If your table is not playing smoothly:

1. Use a lower resolution: go to **Advanced System Options → Video Mode**.
2. Starting with **v39**, the Advanced Options have performance presets to match your hardware's capabilities.
3. More advanced fix: fine tuning the settings in `VPinballX.ini` may allow you to play at a higher resolution by sacrifying visual effects. For example, a table will look much nicer at 4K without dynamic ambient occlusion than at 1080p with dynamic ambient occlusion (which can bring your GPU to its knees...). You could start with:

```
[Player]
; Video options
SyncMode = 2
MaxFramerate = 60
MaxPrerenderedFrames = 0
FXAA = 0
Sharpen = 0
ScaleFXDMD = 0
DisableAO = 1
DynamicAO = 0
SSRefl =
PFReflection = 4
```

Note: Some settings in the `VPinballX.ini` file only apply to specific systems (windows for eg). Eg: `UseNVidiaAPI` has no effect on standalone version.

## Further troubleshooting

For further troubleshooting, refer to the generic support pages.

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**https://wiki.batocera.org/systems:vpinball?rev=1738449258**

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