

# MS-DOS (x86)

Before Windows, Microsoft made a handy little Disc-based Operating System (MS-DOS, commonly referred to as just "DOS"). Lots of people used it for lots of things, but that also included videogames. We're interested in that aspect, especially since you can't just run these old games on modern operating systems anymore.



Emulating DOS games is by far the most complicated thing to emulate on Batocera.



If new to DOS emulation, it is recommended to use the ExoDOS Collection along with Voljega's [ExoDOSConverter](#). This will generate fully functional DOS games ready to play.

Please also note that the different DOS emulators in Batocera are in the process of being reviewed and upgraded, and some of them are a bit twitchy.

This system scrapes metadata for the "pc" group(s) and loads the pc set from the currently selected theme, if available.

## Quick reference

- **Accepted ROM formats:** .pc, .dos, .zip, .squashfs, .dosz
- **Folder:** /userdata/roms/dos

Emulators	Accepted ROM formats
<a href="#">DOSBox</a>	.pc, .dos, .squashfs, .dosz
<a href="#">DOSBox_staging</a>	.pc, .dos, .squashfs, .dosz
<a href="#">DOSBox-X</a>	.pc, .dos, .squashfs, .dosz
<a href="#">libretro: DOSBox_Pure</a>	.pc, .dos, .zip, .squashfs, .dosz

## BIOS

No DOS emulator in Batocera needs a BIOS file to run.

## Game files

Place your DOS game files in its own folder in /userdata/roms/dos with the .pc extension. For

example: `roms/dos/WackyWheels.pc/`.

How exactly they are setup and what additional configuration is require depends on which emulator you use. For first time users, [libretro: DOSBox\\_Pure](#) is recommended.



If intending on using DOSBox\_Pure, `.zip` files can be renamed to `.dosz` (



**Fix Me!**

for fun? Why can you do this? Is it needed in Batocera?) In addition, to mount a ZIP file as the virtual A: or D: drive the `.zip` file can be renamed to `.d.zip`.

## Emulators

### DOSBox

The most standard version of DOSBox. Can be a bit unwieldy to use for newcomers, but it provides the most “pure” experience of DOSBox. Those already familiar with DOSBox will be right at home.

Requires [some setup](#) before games can be run in it.



New users are recommended to use [libretro: DOSBox\\_Pure](#) instead when starting out.

### DOSBox configuration

Standardized features available to all cores of this emulator: `dos.videomode`, `dos.ratio`, `dos.padtokeyboard`

### DOSBox\_Staging

[DOSBox Staging](#) is a fork aimed at ease-of-use. Prioritizes running games, while still striking a balance between emulation quality, speed, and usability.

### DOSBox\_Staging configuration

Standardized features available to all cores of this emulator: `dos.videomode`, `dos.ratio`, `dos.padtokeyboard`

There are no configuration options available yet.

## DOSBox-X

Vastly different from all the other forks, [DOSBox-X](#) aims to support Windows 3.x, 9x and ME games in addition to all the already emulatable DOS games.




How do you use this, though?

## RetroArch

[RetroArch](#) (formerly SSNES), is a ubiquitous frontend that can run multiple “cores”, which are essentially the emulators themselves. The most common cores use the [libretro](#) API, so that's why cores run in RetroArch in Batocera are referred to as “libretro: (core name)”. RetroArch aims to unify the feature set of all libretro cores and offer a universal, familiar interface independent of platform.

### RetroArch configuration

RetroArch offers a **Quick Menu** accessed by pressing [HOTKEY] +  which can be used to alter various things like [RetroArch and core options](#), and [controller mapping](#). Most RetroArch related settings can be altered from Batocera's EmulationStation.

Standardized features available to all libretro cores: `dos.videomode`, `dos.ratio`, `dos.smooth`, `dos.shaders`, `dos.pixel_perfect`, `dos.decoration`, `dos.game_translation`

ES setting name batocera.conf_key	Description ⇒ ES option key_value
<b>Settings that apply to all cores of this emulator</b>	
<b>GRAPHICS BACKEND</b> <code>dos.gfxbackend</code>	Choose your graphics rendering ⇒ OpenGL <code>opengl</code> , Vulkan <code>vulkan</code> .
<b>AUDIO LATENCY</b> <code>dos.audio_latency</code>	Audio latency in milliseconds, turn it up if you hear crackles ⇒ 256 256, 192 192, 128 128, 64 64, 32 32, 16 16, 8 8.
<b>THREADED VIDEO</b> <code>dos.video_threaded</code>	Improves performance at the cost of latency and more video stuttering. Use only if full speed cannot be obtained otherwise. ⇒ On <code>true</code> , Off <code>false</code> .

### libretro: DOSBox\_Pure

Babby's first DOSBox, [DOSBox Pure](#) aims for simplicity and ease of use. Aims at automating the entire process, including pre-configuring everything you might need for a game such as input mapping and batch script creation. This core doesn't require as much setup as the others do, and leverages RetroArch's functionality in addition to DOSBox's. Notably, when launching a game's folder DOSBox Pure will prompt the user for which executable file to launch, instead of requiring a run command to be typed out manually and saved to a file using external tools.

Because of its automated nature, it can be difficult to handle issues when they arise. If a particular game you have doesn't work with DOSBox Pure, it is recommended to try them on the standalone DOSBox emulators (after properly setting them up for them, of course).

While in DOSBox\_Pure, run REMOUNT C: D: to remount the loaded game files in the D: drive.

**libretro: DOSBox\_Pure configuration**

<b>ES setting name batocera.conf_key</b>	<b>Description ⇒ ES option key_value</b>
<b>Settings that apply to all systems this core supports</b>	
<b>CPU TYPE global.pure_cpu_type</b>	Select the fine CPU type for your game ⇒ Autodetect (Compatible) automatic, 386 386, 386 (slow) 386_slow, 386 (prefetch) 386_prefetch, 486 (slow) 486_slow, Pentium (slow) pentium_slow.
<b>CPU CORE METHOD global.pure_cpu_core</b>	Choose an accurate or fast method ⇒ Optimized (auto) automatic, Dynamic (fast) dynamic, Normal (interpreter) normal, Simple (interpreter for old real-mode games) simple.
<b>CPU EMULATED PERFORMANCE global.pure_cycles</b>	Select CPU cycles by model (use with caution) ⇒ Autodetect (Compatible) automatic, MAX (as many as possible) max, 8086/8088, 4.77MHz (315 cps) 315, 286, 6MHz (1320 cps) 1320, 286, 12.5MHz (2750 cps) 2750, 386, 20MHz (4720 cps) 4720, 386DX, 33MHz (7800 cps) 7800, 486DX, 33MHz (13400 cps) 13400, 486DX2, 66MHz (26800 cps) 26800, Pentium, 100MHz (77000 cps) 77000, Pentium II, 300MHz (200000 cps) 200000, Pentium III, 600MHz (500000 cps) 500000, AMD Athlon, 1.2GHz (1000000 cps) 1000000.
<b>RAM SIZE global.pure_memory_size</b>	The amount of RAM for the emulated machine ⇒ No EMS/XMS none, 4MB 4, 8MB 8, 16MB 16, 24MB 24, 32MB 32, 48MB 48, 64MB 64, 96MB 96, 128MB 128, 224MB 224.
<b>GRAPHICS CHIP TYPE global.pure_machine</b>	Video card graphic chip type ⇒ SVGA svga, VGA vga, EGA ega, CGA cga, Tandy tandy, Hercules hercules, PCjr pcjr.

ES setting name batocera.conf_key	Description ⇒ ES option key_value
<b>KEYBOARD LAYOUT</b> global.pure_keyboard_layout	Select physical keyboard layout (not the On-Screen one) ⇒ US us, UK uk, Brazil br, Croatia hr, Czech Republic cz243, Denmark dk, Finland su, France fr, Germany gm, Greece gr, Hungary hu, Iceland is161, Italy it, Netherlands nl, Norway no, Poland pl, Portugal po, Russia ru, Slovakia sk, Slovenia si, Spain sp, Sweden sv, Switzerland (German) sg, Switzerland (French) sf, Turkey tr.
<b>SAVESTATE / REWIND</b> global.pure_savestate	Enable Savestate and optionally Rewind support ⇒ On True, On with rewind support rewind, Off disabled.
<b>GAMEPAD AUTOMATIC MAPPING</b> global.pure_auto_mapping	Apply a gamepad mapping scheme for selected game ⇒ On true, On with game detection message notify, Off false.
<b>JOYSTICK ANALOG DEADZONE</b> global.pure_joystick_analog_deadzone	Set the deadzone of the joystick analog sticks ⇒ 0% 0, 5% 5, 10% 10, 15% 15, 20% 20, 25% 25, 30% 30, 35% 35, 40% 40.
<b>JOYSTICK TIMED INTERVAL</b> global.pure_joystick_timed	Enable timed intervals for joystick axes if drifts ⇒ On true, Off false.
<b>CONTROLLER 1 TYPE</b> global.controller1_dosbox_pure	Select Keyboard, Joysticks or Gravis GamePad mode ⇒ Gravis GamePad (D-pad + 4 Btns) 1, Generic Keyboard Binds 257, Keyboard + Mouse (Left An.) 513, Keyboard + Mouse (Right An.) 769, 1st Joystick (2 Axes, 2 Btns) 1281, Flight Stick (3 Axes, 4 Btns, 1 Hat) 1793, Both Joysticks (4 Axes, 4 Btns) 2049, Custom Keyboard Binds (best for Pad2Key) 3.
<b>CONTROLLER 2 TYPE</b> global.controller2_dosbox_pure	Select Keyboard, Joysticks or Gravis GamePad mode ⇒ Gravis GamePad (D-pad + 4 Btns) 1, Generic Keyboard Binds 257, Keyboard + Mouse (Left An.) 513, Keyboard + Mouse (Right An.) 769, 2nd Joystick (2 Axes, 2 Btns) 1537, Flight Stick (3 Axes, 4 Btns, 1 Hat) 1793, Both Joysticks (4 Axes, 4 Btns) 2049, Custom Keyboard Binds (best for Pad2Key) 3.

## DOSBox standalone preparation



New users should first use [DOSBox\\_Pure](#). It does not require this same level of setup, just put your game's files in a dos/<game name>.pc/ folder and run it.

The standalone DOSBox versions require some setup for each game before they can be run.

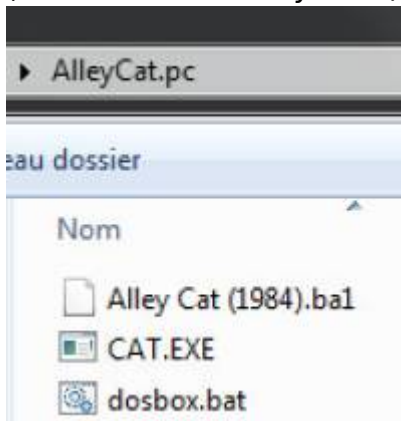
Here's a simple example with the game Alley Cat:

- Start by creating a folder for your game named `AlleyCat.pc`. The first part of the folder name before the `.` must have equal or less than 8 characters and avoid special characters.
- Inside it create a `dosbox.bat` file and edit it to call the executable of the game (For big games it's better to install them on your computer before copying them to Batocera). Here for Alley Cat that gives us:

```
C:  
CAT.EXE
```

- The `C:` harddrive is set by DOSBOX to your game folder (so here `C:` is equal to the inside of `/batocera/share/roms/dos/AlleyCat.pc`). So is `'.'`
- Reboot or refresh your gamelist to see the game
- To exit the emulator, enter `ctrl+F9` with your keyboard

The content of your `AlleyCat.pc` folder should look like that:  
(Don't mind the `Alley Cat (1984).ba1` file)



## DOSBox Emulation: Advanced rundown

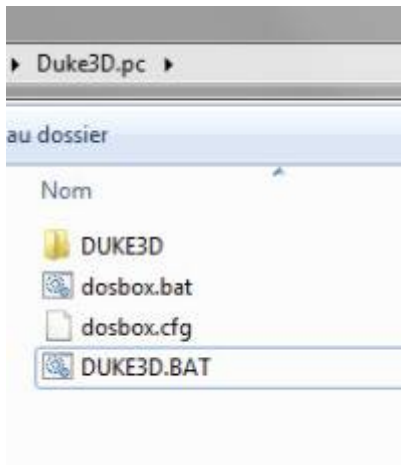
Adding a custom `dosbox.cfg` in your game folder alongside `dosbox.bat` will allow you to specify custom DOSBOX configuration for the game.

Either copy the `dosbox.conf` file from `\batocera\share\system\configs\dosbox\dosbox.conf` (warning : extension in the game folder must be `cfg` not `conf`) or use the following one : <https://pastebin.com/13xrjdkw>

Inside this file, the line `mapperfile=mapper.map` will allow you to use a `mapper.map` file to map any control to your gamepad, including mouse !  
It can be created from within your game by pressing `ctrl+F1` at any time and will then be saved alongside your `dosbox.cfg` and `dosbox.bat` files.

Some parameters from `dosbox.cfg` can also be put instead at the beginning of your `dosbox.bat` if you don't want to use a custom `dosbox.cfg` but some of them won't work there, everything graphics seems to work, but `mapperfile` doesn't work for instance.

Here's an example of what this more advanced version should look like :



## Converting a DOS game to be used on Batocera

You might want to convert a game already using DOSBox, like when bought on GOG or games from the excellent ExoDOS collection.

If you are using ExoDOS collection, I can only recommend once again [ExoDOSConverter](#).

Anyway, if you want to do it manually, here is the process:

The first step is to copy the content of the game folder.

Then we need to adapt the content of the dosbox . cfg and the bat file used to launch the game.

Let's take an example with WackyWheels.

Do not directly copy the dosbox . cfg (or . conf) from the original folder as this can lead to crashing bugs not easily debugged, copy the standard one linked above and then if you encounter any trouble, just see if the original dosbox . cfg had any special configuration and try to use it to your dosbox . cfg

First move the content of the [autoexec] part from the doxbox . cfg part to the beginning of your dosbox . bat and adapt paths. Here we have originally:

```
[autoexec]
cd ..
cd ..
mount c .\games\WackyWhe
imgmount d .\games\WackyWhe\cd\wackywheels.iso -t cdrom
c:
cd wacky
cls
@ww
exit
```

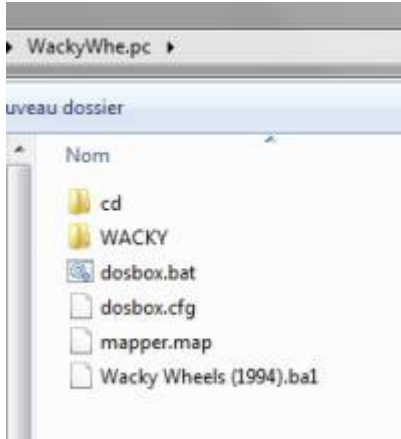
and that will give us in our dosbox.bat on batocera side :

```
imgmount d .\cd\wackyw~1.iso -t cdrom
c:
```

```
cd WACKY
pause
WW.EXE
```

The content of your WackyWhe .pc folder should look like that:

(Don't mind the Wacky Wheels (1994) .ba1 file and mapper .map is perfectly optional)



## Explanations:

- C: is already mounted by Batocera DOSBox, so no need for that
- '.' is also set by Batocera DOSBox to the game folder, by using relative paths your game won't be linked to a folder (you can put in a subfolder or in a different distribution)
- exit is removed because Batocera DOSBox takes care of that too
- imgmount path is simplified but we have to convert the longer-than-8-chars name of the iso to a standard DOS name (that is eight characters total with the last two changed to ~1 - ~2 and ~3 etc. if you have several long filenames starting alike). Anyway maybe it's better to rename the filename in that case.
- Long names are not supported in .cue files either so you may have to rename some .cue/.bin files manually and edit the .cue file to set the correct new name for the bin in it. And it is very strict : no special chars, not even upper case characters
- pause command allow you to pause the screen and easily debug DOS instructions, you can remove it after everything works fine (don't put it after the main executable call or you'll see nothing, I know, I've been there ;) )
- @ww is changed to WW.EXE (just the executable file of the game)

That's it!

Some games may use a bat file launcher which you can adapt too, put its instruction after those of dosbox .cfg's [autoexec] if the original game uses both files.

## Windows 3.1 emulation





It's also possible to emulate Windows 3.1 games with dosbox, the safest way is to get them from the ExoWin3x collection.

You can also convert them with [ExoDOSConverter](#)

## Controller

Most if not all DOS games offered keyboard controls, as that was the one accessory universally available to all computers. It is perfectly fine to use pad2key to bind your physical controller to the virtual keyboard. However, there was one particular PC gamepad controller that could be plugged into the serial port of a MSDOS machine and was somewhat universal, the Gravis PC Gamepad:



For this reason it might be why you see some “colored circle” controller prompts in some games. Blue = , Red = , Yellow =  and Green = .

Here are the default Dos (x86)'s controls shown on a [Batocera Retropad](#):



## Troubleshooting

### Image isn't in the right ratio

For older games, you may have to adjust the `aspect=false` parameter to `aspect=true` to get the correct 4/3 ratio. Be aware that on newer games this may lead to performance problems

### The Joystick is moving by itself

Try modifying `timed=false` to `timed=true`. Can be caused by deadzone too and sadly there is no way to configure deadzone on joystick in DOSBox at the moment

### D-pad is not usable on Xbox 360 controller through the mapper

yeah, it is usable in the mapper, but it doesn't seem to work in-game, I know mate :(

### Joystick deadzones/my stick is drifting

Sadly it doesn't seem to be possible to adjust deadzones in standard dosbox at the moment.

### CD Not Found/CD Driver not present:

you likely forgot to rename cd files with non-dos names (see adv. rundown)

## I can get mount a or mount d to work

Contrary to `imgmount`, `mount` is not able to use 'virtual' path from inside the dosbox machine, so for the `mount` command to work, you need to only use a real local path from the batocera file system. Given that `'.'` is set to the root/directory when DOSBox is launched you have to specify the full absolute path

## The mapper is bugged, it erases my configuration or mix buttons

You're likely victim of the `buttonwrap` parameter in your `dosbox.cfg` conf file. When set to true, its wraps buttons with an upper id than the number of joystick buttons emulated, restarting to 0 (5 will be rewrapped to 0, 6 to 1, etc...) . Set it to false and everything should be fine

## I need to exit the game without leaving Dosbox

[Ctrl] + [F9].

## Further troubleshooting

For further troubleshooting, refer to the [generic support pages](#).

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