# Nintendo 64

The Nintendo 64 is a 64-bit fifth-generation console released by Nintendo on June 23, 1996 in Japan; September 29, 1996 in America for $199.99 USD; March 1, 1997 for the rest of the world. One of the last major home consoles to use the cartridge format, unless you count the recent Nintendo Switch as a home console. Probably one of the most complicated pieces of hardware ever devised, utilizing a combination of 64-bit (hence its name) and 32-bit components. Here's a fun article written by Rodrigo Copetti about it.

Emulation for Nintendo 64 is still experimental, and accuracy issues crop up no matter which hardware emulator you use. Be prepared to switch emulator/core on a per-game basis. If you'd like to watch a video explanation of what's explained on this page, check out Batocera Nation's excellent video on how to setup Nintendo 64 in Batocera.

This system scrapes metadata for the “n64” group(s) and loads the n64 set from the currently selected theme, if available.

### Quick reference

- **Accepted ROM formats:** `.z64 .n64 .ndd .v64 .zip .7z`
- **Folders:** `/userdata/roms/n64 /userdata/roms/n64dd`

| Emulators | Accepted ROM formats |
|---|---|
| libretro: Mupen64Plus-Next | `.z64`, `.n64`, `.v64`, `.zip`, `.7z` |
| libretro: ParaLLel_N64 | `.z64`, `.n64`, `.v64`, `.zip`, `.7z` |
| mupen64plus: gliden64 | `.z64`, `.n64`, `.v64` |
| mupen64plus: glide64mk2 | `.z64`, `.n64`, `.v64` |
| mupen64plus: rice | `.z64`, `.n64`, `.v64` |

## BIOS

The N64 emulators don't need a BIOS to function.

However, if intending on playing N64DD games specifically, the following BIOS file is required:

| MD5 checksum | Share file path | Description |
|---|---|---|
| Fix Me! | `bios/Mupen64plus/IPL.n64` | N64 Dynamic Disk Initial Program Loader for Mupen64Plus |
| 8d3d9f294b6e174bc7b1d2fd1c727530 | `bios/64DD_IPL.bin` | N64 Dynamic Disk Initial Program Loader for Parallel-N64 |

# ROMs

Place your Nintendo 64 and N64DD ROMs in `/userdata/roms/n64/`.

Mupen64Plus has some trouble loading compressed `.zip` files. If you cannot load your ROMs, try unzipping them.

File extensions may not necessarily reflect their true contents, but here are the generally accepted formats:

| Extension | Format |
|---|---|
| `.bin` | Binary representation of data on the ROM. |
| `.n64` | ROM dump stored in little-endian byte-order. |
| `.N64` | ROM dump stored in big-endian byte-order. |
| `.v64` | ROM dumps produced by or compatible with the Doctor V64 CD-ROM drive, with data stored in a byte-swapped version of the N64's native byte-order. |
| `.z64` | ROM dumps produced by or compatible with the Z64, stored in big-endian byte-order. |
| `.z64.ndd` | Dynamic Disk ROM dumps produced by or compatible with the Z64, stored in big-endian byte-order. |

There is no practical difference as to which format to use for loading the ROMs in Batocera.

# Emulators

## RetroArch

RetroArch has its own page.

### libretro: Mupen64Plus-Next

Mupen64Plus-Next is a N64 emulation library for the libretro API, based on Mupen64Plus. It is also the successor of the old Mupen64Plus libretro core. It's still experimental, but incorporates Retroarch's features, such as input remapping from its Quick Menu (`[HOTKEY] +` ).

This is the only emulator in Batocera capable of playing N64DD games.

#### libretro: Mupen64Plus-Next Configuration

Standardized features for this core: `n64.autosave`, `n64.cheevos`

| ES setting name `batocera.conf_key` | Description ⇒ ES option `key_value` | |
|---|---|---|
| **Settings that apply to all systems this core supports** | | |

| | |
|---|---|
| **4:3 RENDERING RESOLUTION `global.mupen64plus-43screensize`** | The rendering resolution when using a 4:3 aspect ratio. If set to auto, will match your current video mode. Severe performance impact. 320×240 for native, 640×480 for “Hi-Res” mode (eg. Perfect Dark).<br>⇒ 320×240 `320×240`, 640×480 `640×480`, 960×720 `960×720`, 1280×960 `1280×960`, 1600×1200 `1600×1200`, 1920×1440 `1920×1440`, 2240×1680 `2240×1680`, 2560×1920 `2560×1920`, 3200×2400 `3200×2400`, 3520×2640 `3520×2640`, 3840×2880 `3840×2880`. |
| **16:9 RENDERING RESOLUTION `global.mupen64plus-169screensize`** | The rendering resolution when using a 16:9 aspect ratio. If set to auto, will match your current video mode. Severe performance impact. 320×240 for native, 640×480 for “Hi-Res” mode (eg. Perfect Dark).<br>⇒ 640×360 `640×360`, 960×540 `960×540`, 1280×720 `1280×720`, 1920×1080 `1920×1080`, 2560×1440 `2560×1440`, 3840×2160 `3840×2160`, 7680×4320 `7680×4320`. |
| **WIDESCREEN HACK (GLITCHY) `global.mupen64plus-aspect`** | Enhancement. Widescreen hack. Very glitchy. Only works when using a 16:9 video mode **and** with bezels (decorations) disabled. Recommended to use ROM patches instead. Some games natively support 16:9 in their in-game options.<br>⇒ Off 243, On `16:9 adjusted`. |
| **TEXTURE FILTERING MODE `global.mupen64plus-BilinearMode`** | Enhancement. Chooses which bilinear filtering method is used to smooth textures on 3D objects. `3point` is accurate to the unique 3-point bilinear filtering the N64 employs as a cost-saving measure, however this introduces some distortion to the resulting textures. `standard` uses a traditional 4-point bilinear filter for more accurate textures. Negligible performance cost.<br>⇒ standard `standard`, 3 point `3point`. |

| | |
|---|---|
| **ANTI-ALIASING (MSAA) `global.mupen64plus-MultiSampling`** | Enhancement. Applies MSAA to smooth out jagged edges on 3D object polygons. Most noticeable at lower resolutions. Does not affect textures. The N64 has no MSAA natively, but this was masked by its blurry video output. Significant performance cost. 4x for powerful enough hardware. Higher values give diminishing returns at an exponential performance cost. Should only be disabled if running at native resolution for a more authentic experience.<br>⇒ Off `0`, 2x 2, 4x 4, 8x 8, 16x 16. |
| **TEXTURE FILTERING `global.mupen64plus-txFilterMode`** | Enables mip-mapping to smooth out textures on distant 3D objects based on distance and angle. Has a minimal performance impact. The “Smooth” settings don't have anisotropic filtering enabled, resulting in very blurry distant textures. The “Sharp” settings enable anisotropic filtering, dramatically improving the clarity of distant textures at the cost of making UI elements blurrier. Has a minimal performance cost. Very subjective, some N64 games actually did use mip-mapping and require it for certain graphical effects (eg. the Peach painting in Super Mario 64) while others completely omitted it, resulting in aliasing textures for distant objects.<br>⇒ Off None, Smooth 1 `Smooth filtering 1`, Smooth 2 `Smooth filtering 2`, Smooth 3 `Smooth filtering 3`, Smooth 4 `Smooth filtering 4`, Sharp 1 `Sharp filtering 1`, Sharp 2 `Sharp filtering 2`. |
| **TEXTURE UPSCALING `global.mupen64plus-txEnhancementMode`** | Enhancement. Uses upscalers/resamplers on textures to improve their clarity. Improvements are subjective.<br>⇒ Off None, As Is `As Is`, X2 X2, X2SAI X2SAI, HQ2X HQ2X, HQ2XS HQ2XS, LQ2X LQ2X, LQ2XS LQ2XS, HQ4X HQ4X, 2xBRZ 2xBRZ, 3xBRZ 3xBRZ, 4xBRZ 4xBRZ, 5xBRZ 5xBRZ, 6xBRZ 6xBRZ. |
| **RDP PLUGIN `global.mupen64plus-rdpPlugin`** | ⇒ GLideN64 (Fastest) `glide64`, ParaLLEl-RDP `parallel`, Angrylion (Most Compatible) `angrylion`. |

| | |
|---|---|
| **RSP PLUGIN `global.mupen64plus-rspPlugin`** | ⇒ HLE (Fastest) `hle`, ParaLLEl (Best LLE) `parallel`, CXD4 (LLE Fallback) `cxd4`. |
| **CPU CORE `global.mupen64plus-cpuCore`** | ⇒ Dynarec (Fastest) `dynamic_recompiler`, Cached Interpreter `cached_interpreter`, Pure Interpreter (Most Accurate) `pure_interpreter`. |
| **CONTROLLER TYPE 1 `mupen64plus-controller1`** | Useful for N64 style controllers. Limited hotkeys for controllers without dedicated hotkey.<br>⇒ RetroPad (Default) `retropad`, n64 `n64`, N64 (Limited Hotkeys) `n64limited`. |
| **CONTROLLER TYPE 2 `mupen64plus-controller2`** | Useful for N64 style controllers.<br>⇒ RetroPad (Default) `retropad`, n64 `n64`. |
| **CONTROLLER TYPE 3 `mupen64plus-controller3`** | Useful for N64 style controllers.<br>⇒ RetroPad (Default) `retropad`, n64 `n64`. |
| **CONTROLLER TYPE 4 `mupen64plus-controller4`** | Useful for N64 style controllers.<br>⇒ RetroPad (Default) `retropad`, n64 `n64`. |
| **CONTROLLER PAK 1 `global.mupen64plus-pak1`** | The accessory pack plugged into controller 1.<br>⇒ Off `none`, memory `memory`, rumble `rumble`. |
| **CONTROLLER PAK 2 `global.mupen64plus-pak2`** | Same as above for the second controller.<br>⇒ Off `none`, memory `memory`, rumble `rumble`. |
| **CONTROLLER PAK 3 `global.mupen64plus-pak3`** | Same as above for the third controller.<br>⇒ Off `none`, memory `memory`, rumble `rumble`. |
| **CONTROLLER PAK 4 `global.mupen64plus-pak4`** | Same as above for the fourth controller.<br>⇒ Off `none`, memory `memory`, rumble `rumble`. |
| **FRAME RATE `global.mupen64plus-Framerate`** | Full speed can break some games.<br>⇒ Original `Original`, Full speed `Fullspeed`. |
| **PARALLEL-RDP UPSCALER `global.mupen64plus-parallel-rdp-upscaling`** | Only applies when using Parallel-RDP as the chosen RDP Plugin.<br>⇒ 1x (Default) 1x, 2x 2x, 3x 3x, 4x 4x. |

Other configuration settings must be configured from RetroArch's **Quick Menu** ([HOTKEY] + ).

#### libretro: ParaLLel_N64

A low level emulator that incorporates the Angrylion RDP renderer and Vulkan APIs for hardware

accelerated emulation. It is more accurate but lacks some enhancement options.

#### libretro: ParaLLel_N64 configuration

Standardized features for this core: n64.autosave, n64.cheevos

| **ES setting name batocera.conf_key** | **Description ⇒ ES option key_value** |
|---|---|
| **Settings that apply to all systems this core supports** | |
| **GRAPHICS PLUGIN parallel-n64-gfxplugin** | Choose the Parallel N64 graphics plugin.<br>⇒ Glide64 glide64, Gln64 gln64, Rice rice, Angrylion angrylion, Parallel parallel. |
| **RENDERING RESOLUTION global.parallel-n64-screensize** | Improve the fidelity of 3D models (does not affect 2D sprites). Severe performance impact. 320×240 for native, 640×480 for “Hi-Res” mode (eg. Perfect Dark).<br>⇒ 320×240 320×240, 640×480 640×480, 960×720 960×720, 1280×960 1280×960, 1440×1080 1440×1080, 1600×1200 1600×1200, 1920×1440 1920×1440, 2240×1680 2240×1680, 2880×2160 2880×2160, 5760×4320 5760×4320. |
| **WIDESCREEN HACK (GLITCHY) global.parallel-n64-aspectratiohint** | Break aspect ratio and stretch the image.<br>⇒ Off normal, On widescreen. |
| **TEXTURE FILTERING global.parallel-n64-filtering** | Enhancement. Chooses which bilinear filtering method is used to smooth textures on 3D objects. N64 3-point is accurate to the unique 3-point bilinear filtering the N64 employs as a cost-saving measure, however this introduces some distortion to the resulting textures. Bilinear uses a traditional 4-point bilinear filter for more accurate textures. Negligible performance cost.<br>⇒ Automatic automatic, N64 3-point N64 3-point, Bilinear bilinear, Nearest nearest. |
| **FRAME RATE global.parallel-n64-framerate** | Fullspeed can break some games.<br>⇒ fullspeed fullspeed, original original. |

| **ES setting name `batocera.conf_key`** | **Description ⇒ ES option `key_value`** |
|---|---|
| **CONTROLLER TYPE 1 `global.parallel-n64-controller1`** | Useful for N64 style controllers. Limited hotkeys for controllers without dedicated hotkey. ⇒ RetroPad (Default) `retropad`, N64 `n64`, N64 (Limited Hotkeys) `n64limited`. |
| **CONTROLLER TYPE 2 `global.parallel-n64-controller2`** | Useful for N64 style controllers. ⇒ RetroPad (Default) `retropad`, N64 `n64`. |
| **CONTROLLER TYPE 3 `global.parallel-n64-controller3`** | Useful for N64 style controllers. ⇒ RetroPad (Default) `retropad`, N64 `n64`. |
| **CONTROLLER TYPE 4 `global.parallel-n64-controller4`** | Useful for N64 style controllers. ⇒ RetroPad (Default) `retropad`, N64 `n64`. |
| **CONTROLLER PAK 1 `global.parallel-n64-pak1`** | The accessory pack plugged into controller 1. ⇒ Off `none`, memory `memory`, rumble `rumble`. |
| **CONTROLLER PAK 2 `global.parallel-n64-pak2`** | Same as above for the second controller. ⇒ Off `none`, memory `memory`, rumble `rumble`. |
| **CONTROLLER PAK 3 `global.parallel-n64-pak3`** | Same as above for the third controller. ⇒ Off `none`, memory `memory`, rumble `rumble`. |
| **CONTROLLER PAK 4 `global.parallel-n64-pak4`** | Same as above for the fourth controller. ⇒ Off `none`, memory `memory`, rumble `rumble`. |

Other configuration settings must be configured from RetroArch's **Quick Menu** (`[HOTKEY]` + ).

## Mupen64Plus

A standalone N64 emulator. Can utilize multiple plugins for various aspects of its emulation. For Batocera's purposes, each “core” can also be a different video plugin of the same emulator.

- “Mupen64Plus: GLide64mk2” for the enhanced **GLide64mk2** video plugin.
- “Mupen64Plus: GLideN64” for the **GLideN64** video plugin. Allows the use of hi-res texture packs.
- “Mupen64Plus: Rice” for the **Rice** video plugin. Allows use of hi-res texture packs.

### Mupen64Plus configuration

Standardized features available to all cores of this emulator: `n64.videomode`, `n64.videomode`, `n64.bezel`, `n64.bezel_stretch`, `n64.hud`, `n64.hud_corner`, `n64.bezel.tattoo`,

n64.bezel.tattoo_corner, n64.bezel.tattoo_file, n64.bezel.resize_tattoo

| ES setting name batocera.conf_key | Description ⇒ ES option key_value |
|---|---|
| **Settings that apply to most video plugins of this emulator (exceptions noted)** | |
| **GAME ASPECT RATIO n64.mupen64plus_ratio** | ⇒ 4:3 4/3, 16:9 16/9. |
| **FRAMESKIP (GL64MK2 ONLY) n64.mupen64plus_frameskip** | Skip frames to improve performance (smoothness). ⇒ Off 0, Autodetect automatic, 1 1, 2 2, 3 3, 4 4, 5 5. |
| **AUDIO SYNC n64.mupen64plus_AudioSync** | Enable second audio limiter. Improves audio quality at the cost of performance. ⇒ Off False, On True. |
| **AUDIO BUFFER (SAMPLES) n64.mupen64plus_AudioBuffer** | Lower values reduce audio latency and improve performance, but can cause audio issues. ⇒ Very High Very High, High High, Medium Medium, Low Low. |
| **TEXTURE MIP-MAPPING (BLUR) n64.mupen64plus_Mipmapping** | Enhancement. Enables mip-mapping to smooth out textures on distant 3D objects based on distance and angle. Should be used in conjunction with n64.mupen64plus_Anisotropic. Has a minimal performance cost. Refer to this page for details. Generally advised to leave this on (some N64 games actually used mip-mapping for graphical effects eg. the Peach painting in Super Mario 64), but some users may prefer the 'hardness' of distant objects with it off, especially at increased rendering resolutions. ⇒ Off 0, nearest 1, bilinear 2, trilinear 3. |
| **ANISOTROPIC FILTERING n64.mupen64plus_Anisotropic** | Enables anisotropic filtering to enhance perspective textures. Dramatically improves the clarity of distant objects when mip-mapping is turned on. Has a small performance impact. Refer to this page for details. Recommended to set it as high as you can go. If not using mip-mapping, it is recommended to leave this off as it can make UI elements unnecessarily blurry. ⇒ Off 0, 2x 2, 4x 4, 8x 8, 16x 16. |
| **ANTI-ALIASING (MSAA) n64.mupen64plus_AntiAliasing** | Enhancement. Applies MSAA to smooth out jagged edges on 3D object polygons. Most noticeable at lower resolutions. Does not affect textures. Has a significant performance impact. 4x for powerful enough hardware. Higher values give diminishing returns at an exponential performance cost. Should only be disabled if running at native resolution for a more authentic experience. ⇒ Off 0, 2x 2, 4x 4, 8x 8, 16x 16. |

| ES setting name batocera.conf_key | Description ⇒ ES option key_value |
|---|---|
| **TEXTURE UPSCALING (RICE ONLY) n64.mupen64plus_TextureEnhancement** | Enhancement. Uses upscalers/resamplers on textures to improve their clarity. Improvements are subjective.<br>⇒ Off 0, 2X 1, 2XSAI 2, HQ2X 3, LQ2X 4, HQ4X 5, Sharpen 6, Sharpen More 7, External 8, Mirrored 9. |
| **LOAD CUSTOM TEXTURES n64.mupen64plus_LoadHiResTextures** | Uses the hi-res texture pack for the game, if any. Only confirmed for the Rice and GLideN64 video plugins. No harm leaving on True if there aren't any files present anyway.<br>⇒ Off False, On True. |
| **DISABLE 4MB EXPANSION RAM PACK n64.mupen64plus_DisableExtraMem** | Disables the expansion pack required for some games. Polarity for this setting is reversed for EmulationStation's user-facing setting. Emulation of this can cause issues in games that don't require it, so it is suggested to leave disabled unless needed.<br>⇒ Off False, On True. |
| **READ FRAMEBUFFER EVERY FRAME (GLIDE64MK2) n64.mupen64plus_fb_read_always** | Required for some effects in-game (Banjo Kazooie and DK64 transitions), can cause slowdown.<br>⇒ Game default -1, Disable 0, Enable 1. |
| **CONTROLLER TYPE 1 n64.mupen64-controller1** | Useful for N64 style controllers. Limited hotkeys for controllers without dedicated hotkey.<br>⇒ RetroPad (Default) retropad, N64 n64, N64 (Limited Hotkeys) n64limited. |
| **CONTROLLER TYPE 2 n64.mupen64-controller2** | Useful for N64 style controllers.<br>⇒ RetroPad (Default) retropad, N64 n64. |
| **CONTROLLER TYPE 3 n64.mupen64-controller3** | Useful for N64 style controllers.<br>⇒ RetroPad (Default) retropad, N64 n64. |
| **CONTROLLER TYPE 4 n64.mupen64-controller4** | Useful for N64 style controllers.<br>⇒ RetroPad (Default) retropad, N64 n64. |
| **CONTROLLER SENSITIVITY 1 n64.mupen64-sensitivity1** | Set the sensitivity of the joystick analog sticks.<br>⇒ 50% 50, 60% 60, 70% 70, 80% 80, 90% 90, 100% (Default) 100, 110% 110, 120% 120, 130% 130, 140% 140, 150% 150. |
| **CONTROLLER SENSITIVITY 2 n64.mupen64-sensitivity2** | Set the sensitivity of the joystick analog sticks.<br>⇒ 50% 50, 60% 60, 70% 70, 80% 80, 90% 90, 100% (Default) 100, 110% 110, 120% 120, 130% 130, 140% 140, 150% 150. |
| **CONTROLLER SENSITIVITY 3 n64.mupen64-sensitivity3** | Set the sensitivity of the joystick analog sticks.<br>⇒ 50% 50, 60% 60, 70% 70, 80% 80, 90% 90, 100% (Default) 100, 110% 110, 120% 120, 130% 130, 140% 140, 150% 150. |
| **CONTROLLER SENSITIVITY 4 n64.mupen64-sensitivity4** | Set the sensitivity of the joystick analog sticks.<br>⇒ 50% 50, 60% 60, 70% 70, 80% 80, 90% 90, 100% (Default) 100, 110% 110, 120% 120, 130% 130, 140% 140, 150% 150. |
| **CONTROLLER DEADZONE 1 n64.mupen64-deadzone1** | Set the deadzone of the joystick analog sticks.<br>⇒ 0% 0, 5% (Default) 5, 10% 10, 15% 15, 20% 20, 25% 25, 30% 30. |

| ES setting name `batocera.conf_key` | Description ⇒ ES option `key_value` |
|---|---|
| **CONTROLLER DEADZONE 2 `n64.mupen64-deadzone2`** | Set the deadzone of the joystick analog sticks. ⇒ 0% `0`, 5% (Default) `5`, 10% `10`, 15% `15`, 20% `20`, 25% `25`, 30% `30`. |
| **CONTROLLER DEADZONE 3 `n64.mupen64-deadzone3`** | Set the deadzone of the joystick analog sticks. ⇒ 0% `0`, 5% (Default) `5`, 10% `10`, 15% `15`, 20% `20`, 25% `25`, 30% `30`. |
| **CONTROLLER DEADZONE 4 `n64.mupen64-deadzone4`** | Set the deadzone of the joystick analog sticks. ⇒ 0% `0`, 5% (Default) `5`, 10% `10`, 15% `15`, 20% `20`, 25% `25`, 30% `30`. |

You can use switch the connected virtual controller accessory to a Mempak with L3 and a Rumblepak with R3 while in game!

Mupen64Plus standalone cannot ordinarily be configured by altering its CFG file in userdata, as that gets overwritten every launch. If you're feeling adventurous, you can edit the `/usr/share/batocera/configgen/configgen-defaults-arch.yml` and utilize Batocera's overlay feature to keep the settings. Support cannot be provided should you do this, however.

## Hi-res texture packs

Hi-res texture packs replace the textures in a game with other (typically higher resolution) textures. Support for this has been baked into Mupen64 ever since textures could be extracted from the game itself and naturally Batocera supports their use. The “MUPEN64PLUS / GLIDE64MK2”, “MUPEN64PLUS / RICE” and 🔧 Fix Me! “LIBRETRO / MUPEN64PLUS-NEXT” emulators support this feature.

This feature was buggy in Batocera **v31**, but fixed in Batocera **v32**.




The author of the texture pack will usually include instructions on how to install them on standalone Mupen64Plus, but in case they don't here are the general steps:

1. Grab your texture pack and put it in `/userdata/system/.local/share/mupen64plus/hires_texture/` (for .htc that would be `…/mupen64plus/cache/` instead).

   Bug: For some reason this path is actually `/userdata/bios/mupen64plus/cache/` instead.

2. Go to **ADVANCED GAME OPTIONS** in EmulationStation and enable **HIRES TEXTURES**. This something you can enable on a game per game basis, when you have the corresponding texture pack.
3. HD bing bing wahoos!

Texture packs can be very heavy (several hundreds of MB) and have an impact on the emulation performance if your system is on the lower side of the spectrum.

Raw PNG “Loose” packs are supported by the Rice and GLide64mk2 video plugins, whereas the `.htc` file is only supported by GLide64mk2! `.dat` formats are depreciated and not compatible with any available emulator in Batocera.

Some good places to start searching for N64 texture replacements:

- Batocera Nation's download page (scroll down to "HD Texture Packs for Nintendo 64"). These

packs are already in a ready-to-go format.
- The "Completed Projects" page on the Emutalk forum. Most packs include installation instructions written by the author. Do note that this comes from the perspective of using the standalone emulators, and not all texture packs may support their libretro equivalents.
- Emulation King's N64 section (scroll down to "N64 Texture Packs") is another good, organised resource, however it usually excludes the author's installation instructions on the website itself. A lot of texture packs do feature readmes on how to use them, though.
- You may find some on the romhacking.net forum, however it's not organized per platform.
- The Texture Packs subreddit is a good place to discuss and share texture packs.
- The Game Upscale subreddit is similar but focuses more on upscaling the existing content with sophisticated AI instead of redrawing it or doing it in a different style. You can browse for just the "finished" projects by using its tag.

You might also want to look into 60 FPS patches/codes for your game while you're at it. Batocera cannot provide support for such hacks if something goes wrong, though, so the first step you should do if something goes wrong is to try it without the patch/code!

## N64 Disc Drive

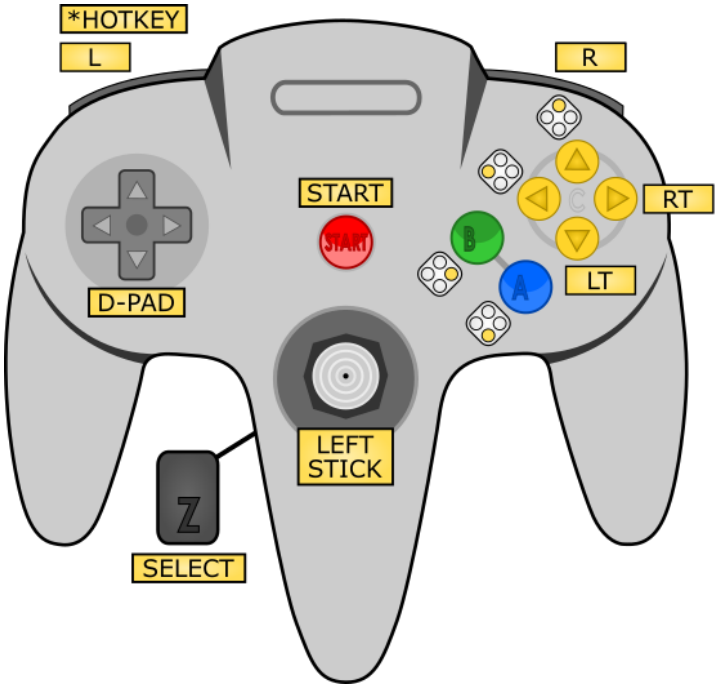
N64 Disc Drive has its own page at n64dd

## Controls

As of V38 many N64 style controllers are already mapped for you out of the box. If your controller is not refer to the information below to map inputs according to your controller type.

For V37 and older if using a N64 style controller you'll have to manually map inputs in ES and then remap in Retroarch and save a core remap and/or manually edit the Mupen64Plus input.xml file.

Remapping the controls as necessary in RetroArch's Quick Menu:




| BATOCERA MAPPING | RETROARCH REMAP |
|---|---|
|  | A Button --> B Button |
|  | B Button --> A Button |
|  | X Button --> C Buttons Y- |
|  | Y Button --> C Buttons X- |
| START | NO CHANGE |
| SELECT | SELECT --> Z TRIGGER |
| D-PAD | NO CHANGE |
| L | NO CHANGE |
| R | NO CHANGE |
| LEFT STICK | NO CHANGE |
| LT | L2 Button --> C Buttons Y+ |
| RT | R2 Button --> C Buttons X+ |

*HOTKEY
The Switch N64 controller HOTKEY is mapped to the HOME button.
For any N64 style controller without enough buttons for a dedicated HOTKEY button it is recommended to use "L".
If using "L" and "HOTKEY" on the same button it is recommended to disable hotkeys except for HOTKEY+START(Exit).

If using V38 and using a N64 controller without a dedicated hotkey button, use “N64 (Limited Hotkeys)” as the controller type. This will prevent unintended hotkey activation. Otherwise use “N64” controller type for all N64 style controllers.
If using V37 or older it's recommended to either map L + Hotkey to “L” and then disable all hotkeys except “Exit”, or simply do not map L and only use it for the Hotkey. (Few N64 games require the use of the “L” button).

←-

Here are the default Nintendo 64's controls shown on a Batocera Retropad for libretro cores:

Here are the default Nintendo 64's controls shown on a Batocera Retropad for Mupen64Plus:

## Remapping for standalone Mupen64Plus

If instead you'd like to change the way that Mupen64Plus handles the inputs sent from ES/Batocera, you can change *its* remapping configuration.

Unlike with the libretro core, remaps for standalone Mupen64Plus can be configured by editing `userdata/system/configs/mupen64/input.xml`. Back up this file before making edits to it. When you open it, you'll see the bindings like so:

```
<inputList>
<input name="AnalogDeadzone" value="0,0" />
<input name="AnalogPeak"     value="32768,32768" />
<input name="l3"             value="Mempak switch" />
```

```
<input name="r3"             value="Rumblepak switch" />
<input name="a"               value="C Button R" />
<input name="b"               value="A Button" />
<input name="x"               value="C Button U" />
...
```

The input names on the left are the virtual Retropad Batocera uses to convert your controller inputs. You don't typically need to edit these.

The values on the right are the controller signal sent to the game. Feel free to switch these around with each other.

Mupen64 can only accept one name per value; if multiple are detected it will only use the first occurrence. For example, if you bind the n64 Z value to both L2 and R2 Retropad names, only the L2 button will activate the Z value.

You can assign various Mupen64 commands here like `Mempack switch`!

# Troubleshooting

## 2D graphics are appearing with gaps/lines in them

Turn off any upscaling settings such as increasing the rendering resolution. By default, Batocera will not be using any upscaling settings.

## The RetroArch Quick Menu is graphically bugged

This issue affects Batocera **v35** on RK3326-based images such as the Odroid Go Advance.

If the Quick Menu has missing text and RetroArch notifications look like multi-colored boxes like this:




Then try going to **ADVANCED SYSTEM OPTIONS → GRAPHICS API** and set it to “OPENGL”.

## Further troubleshooting

For further troubleshooting, refer to the generic support pages.

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https://wiki.batocera.org/ - **Batocera.linux - Wiki**

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Last update: **2025/10/27 20:11**