Nintendo Entertainment System

The Nintendo Entertainment System, known as the Nintendo Famicom in Japan with a radically different design, is an 8-bit third-generation video game console released by Nintendo in Japan in 1983. It was redesigned as the NES and released two years later in the US, retailing for $179.99. Arguably the first majorly successful video game console after the North American video game crash of '83; probably why it looks more like a VCR than a console.

The original Famicom had the Family Computer Disk System add-on released for it a few years after its release which allowed playback of games on higher capacity discs. These discs commonly featured enhanced sound capabilities and the ability to save the game data, as opposed to using passwords to resume progress. Since the NES had a delayed release, it included additional mapping hardware negating the need for the add-on, albeit without the sound enhancements. Many Famicom disk-only games were ported to cartridge form for their US release. The default theme, Carbon, supports switching between regions in its theme settings in the case that you'd prefer to see the Famicom design instead of the NES design on the system list.

For emulation of the Famicom Disk System (FDS) specifically, use the `fds` folder instead.

Emulation of the NES is pretty well established. If your machine can only emulate one system at full speed, it will be this. Choice of emulator doesn't particularly matter, they're all good nowadays. Technically, MAME can emulate the Vs. Dualsystem cabinet, but if this your first time hearing about that don't worry about it.

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

Grouped with the “nes” group of systems.

Quick reference

- **Emulator:** RetroArch
- **Cores available:** libretro: fceumm, libretro: Nestopia, libretro: Mesen
- **Folder:** `/userdata/roms/nes`
- **Accepted ROM formats:** `.nes`, `.unif`, `.unf`, `.zip`, `.7z`

BIOS

No NES emulator included in Batocera requires BIOS files.

ROMs

`.nes` for cartridges, `.fds` for Famicom discs. Although the emulators can emulate both NES cartridges and Famicom disks just fine, Batocera has the systems split up into two separate entries, `/userdata/roms/nes` for NES and `/userdata/roms/fds` for Famicom. Put your ROMs in their respective folders, and then if you want you can group the systems inside of EmulationStation so that they share a menu.

Famicom disks typically have two sides! If you encounter a static screen that starts with B then it's likely asking you to flip sides. The default shortcut for flipping sides is L1.

The ROMs are pretty easy to mod as well, just open them up in a tile editor and you'll see all the game/sprite data stored in 8×8 pixel tiles. Level layout changes typically require a specialized level editor program for that game (if there even is one).

Emulators

NES emulators will typically rely on the filename to choose the correct region setting and speed by default. Nestopia is an exception, it uses a separate file called `Nstdatabase.xml`, located in the `userdata/bios` folder.

RetroArch

RetroArch has its own page.

libretro: fceumm

FCE Ultra “mappers modified” is a libretro-maintained fork of FCE Ultra. High compatibility. A small amount of early romhacks may only work in this emulator.

libretro: fceumm configuration

Standardized features for this core: `nes.rewind`, `nes.autosave`, `nes.use_guns`, `nes.netplay`, `nes.cheevos`

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

ES setting name **batocera.conf_key**	**Description ⇒ ES option key_value**
REDUCE SPRITE FLICKERING **nes.fceumm_nospritelimit**	Enhancement. The NES has an 8 sprite limit per line, when this is exceeding the remaining sprites are flickered between (or sometimes just don't show up at all!) This setting removes that limit. Enabling it has no ill effect in most games but is less accurate to the original hardware. ⇒ Off `disabled`, On `enabled`.
CROP OVERSCAN **nes.fceumm_cropoverscan**	The NES outputs an image that is larger than what would have been displayed on the typical CRT TVs used during the time period. Therefore, some games display “garbage” pixels here that aren't intended to be seen. This setting crops out the border to simulate the same effect. Some games only have garbage on the top/bottom or the sides of the screen, others have none whatsoever. It's safe just to leave it on for all games if you want. ⇒ None `none`, Horizontal `h`, Vertical `v`, Both `both`.
COLOR PALETTE **nes.fceumm_palette**	Choose which color palette to use. Can be used to simulate colors of particular displays. ⇒ default `default`, asqrealc `asqrealc`, nintendo-vc `nintendo-vc`, rgb `rgb`, yuv-v3 `yuv-v3`, unsaturated-final `unsaturated-final`, sony-cxa2025as-us `sony-cxa2025as-us`, pal `pal`, bmf-final2 `bmf-final2`, bmf-final3 `bmf-final3`, smooth-fbx `smooth-fbx`, composite-direct-fbx `composite-direct-fbx`, pvm-style-d93-fbx `pvm-style-d93-fbx`, ntsc-hardware-fbx `ntsc-hardware-fbx`, nes-classic-fbx-fs `nes-classic-fbx-fs`, nescap `nescap`, wavebeam `wavebeam`, custom `custom`.
NTSC FILTER **nes.fceumm_ntsc_filter**	The emulator has the Blarg NTSC filter built-in, unrelated to the shader preset you can choose within Batocera. You can use Batocera's or RetroArch's preset shaders instead. ⇒ Off `disabled`, Composite (color bleeding + artifacts) `composite`, SVideo (color bleeding only) `svideo`, RGB (crisp image) `rgb`.
SOUND QUALITY (HIGHER DEVICES) **nes.fceumm_sndquality**	Sound quality. `Low` is good for most games, but those that run at lower clocks (like PAL games) sound terrible on this. `High` is good for everything. `Very High` is nearly cycle-accurate, but has substantially higher requirements than the other settings. If you're on at least a Pi 2 or higher this shouldn't matter. ⇒ Low `Low`, High `High`, Very High `Very High`.
OVERCLOCK (UNSTABLE) **nes.fceumm_overclocking**	Enhancement. Overclocks the emulated PPU by adding dummy scanlines, giving the game more time to execute per frame. This can be used to avoid console slowdown in games such as Contra Force, but some games encounter glitches with it on. `2x-Postrender` applies the overclock before NMI. `2x-VBlank` applies the overclock after NMI. ⇒ disabled `disabled`, 2x-Postrender `2x-Postrender`, 2x-VBlank `2x-VBlank`.
CONTROLLER 1 TYPE **nes.controller1_nes**	Choose what is plugged into port 1. The NES Zapper defaults to being controlled by your cursor. ⇒ Autodetect 1, NES Gamepad 513, NES Zapper 258.

ES setting name batocera.conf_key	Description ⇒ ES option key_value
CONTROLLER 2 TYPE nes.controller2_nes	Same as above but for port 2. In addition, also supports the Arkanoid paddle. ⇒ Autodetect 1, NES Gamepad 513, NES Zapper 258, Arkanoid paddle 514.

libretro: Nestopia

A fork of Nestopia, Nestopia Undead Edition is the bug-fixed revival of the emulator. High compatibility and accuracy.

libretro: Nestopia configuration

Standardized features for this core: `nes.rewind`, `nes.autosave`, `nes.use_guns`, `nes.netplay`

ES setting name batocera.conf_key	Description ⇒ ES option key_value
Settings that apply to all systems this core supports	
REDUCE SPRITE FLICKERING nes.nestopia_nospritelimit	Enhancement. The NES has an 8 sprite limit per line, when this is exceeding the remaining sprites are flickered between (or sometimes just don't show up at all!) This setting removes that limit. Enabling it has no ill effect in most games but is less accurate to the original hardware. ⇒ Off `disabled`, On `enabled`.
CROP OVERSCAN nes.nestopia_cropoverscan	Crops out video edge hidden under bezel of analog TV ⇒ None `none`, Horizontal `h`, Vertical `v`, Both `both`.
COLOR PALETTE nes.nestopia_palette	Choose which color palette to use. ⇒ consumer `consumer`, cxa2025as `cxa2025as`, canonical `canonical`, alternative `alternative`, rgb `rgb`, pal `pal`, composite-direct-fbx `composite-direct-fbx`, pvm-style-d93-fbx `pvm-style-d93-fbx`, ntsc-hardware-fbx `ntsc-hardware-fbx`, nes-classic-fbx-fs `nes-classic-fbx-fs`, custom `custom`.
NTSC FILTER nes.nestopia_blargg_ntsc_filter	The emulator has the Blarg NTSC filter built-in, unrelated to the shader preset you can choose within Batocera. You can use Batocera's or RetroArch's preset shaders instead. ⇒ Off `disabled`, Composite (color bleeding + artifacts) `composite`, SVideo (color bleeding only) `svideo`, RGB (crisp image) `rgb`.
BLARGG NTSC FILTER global.nestopia_blargg_ntsc_filter	Core-powered video filter. ⇒ Off `disabled`, Composite (color bleeding + artifacts) `composite`, SVideo (color bleeding only) `svideo`, RGB (crisp image) `rgb`.

ES setting name `batocera.conf_key`	Description ⇒ ES option `key_value`
*__OVERCLOCK (UNSTABLE)__ **`nes.nestopia_overclock`**	Enhancement. Minimize in-game slowdowns of some games (Contra Force). May cause random crashes. ⇒ Off `1x`, `2x` `2x`.
4 PLAYER ADAPTER **`nes.nestopia_select_adapter`**	Manually select a 4 Player Adapter for some games ⇒ Autodetect `automatic`, NTSC (NES) `ntsc`, Famicom (FDS) `famicom`.

libretro: Mesen

The libretro port of a modern NES emulator with 100% mapper compatibility. Is more demanding than the other, more innacurate emulators, but this is only a concern on *really* weak hardware like the Pi 0.

libretro: Mesen configuration

Standardized features for this core: `nes.rewind`, `nes.autosave`, `nes.netplay`, `nes.padtokeyboard`

ES setting name `batocera.conf_key`	Description ⇒ ES option `key_value`
Settings that apply to all systems this core supports	
CONSOLE REGION **`global.mesen_region`**	Dendy is a popular Russian clone with unique characteristics. ⇒ NTSC `NTSC`, PAL `PAL`, Dendy `Dendy`.
DISPLAY ROTATION **`global.mesen_screenrotation`**	Rotate the screen, useful for certain vertical gameplay homebrews. ⇒ None `None`, 90 degrees `90 degrees`, 180 degrees `180 degrees`, 270 degrees `270 degrees`.
NTSC FILTER **`global.mesen_ntsc_filter`**	Core-powered video filter. Bisqwit filters are CPU heavy. ⇒ Disabled `Disabled`, Composite (Blargg) `Composite (Blargg)`, S-Video (Blargg) `S-Video (Blargg)`, RGB (Blargg) `RGB (Blargg)`, Monochrome (Blargg) `Monochrome (Blargg)`, Bisqwit 2x `Bisqwit 2x`, Bisqwit 4x `Bisqwit 4x`, Bisqwit 8x `Bisqwit 8x`.
REDUCE SPRITE FLICKERING **`global.mesen_nospritelimit`**	Enhancement. Remove the eight sprite per line limit. ⇒ Off `False`, On `True`.

ES setting name `batocera.conf_key`	**Description ⇒ ES option `key_value`**
COLOR PALETTE `global.mesen_palette`	⇒ Default `Default`, Composite Direct (FirebrandX) `Composite Direct (by FirebrandX)`, Nes Classic `Nes Classic`, Nestopia (RGB) `Nestopia (RGB)`, Original Hardware (FirebrandX) `Original Hardware (by FirebrandX)`, PVM Style (FirebrandX) `PVM Style (by FirebrandX)`, Sony CXA2025AS `Sony CXA2025AS`, Unsaturated v6 (FirebrandX) `Unsaturated v6 (by FirebrandX)`, YUV v3 (Firebrand) `YUV v3 (by FirebrandX)`, Custom `Custom`.
LOAD CUSTOM TEXTURES `global.mesen_hdpacks`	Load HD texture packs from `/userdata/bios/HdPacks/`. ⇒ Off `False`, On `True`.
(FDS) AUTOMATICALLY LOAD DISK SIDE A `global.mesen_fdsautoinsertdisk`	Avoids having to manually load side A every time. ⇒ Off `False`, On `True`.
(FDS) FAST FORWARD DISK LOADING `global.mesen_fdsfastforwardload`	Reduce load time at the cost of accuracy. ⇒ Off `False`, On `True`.
DEFAULT POWER ON RAM STATE `global.mesen_ramstate`	Useful for speedruns/glitches. ⇒ All 0s (Default) `All 0s (Default)`, All 1s `All 1s`, Random Values `Random Values`.
OVERCLOCK (UNSTABLE) `global.mesen_overclock`	Enhancement. Reduces system slowdown. Causes issues in some games. ⇒ None `None`, Low `Low`, Medium `Medium`, High `High`, Very High `Very High`.
OVERCLOCK TYPE `global.mesen_overclock_type`	Prefer “Before NMI”, change to After NMI only if needed by the game. ⇒ Before NMI `Before NMI (Recommended)`, After NMI `After NMI`.

Separation of NES and Famicom

This is for if you're interested in having both the NES and Famicom appear in the system list *at the same time with different ROM folders*.

If you'd like to simply switch the NES system to the Famicom one, you can do so by selecting the appropriate regional settings in your theme's settings (if it supports it; the default theme does).

1. Navigate to `configgen-defaults.yml` and add the following to the bottom of it:

   configgen-defaults.yml

   ```
   famicom:
     emulator: libretro
     core:     fceumm
   ```

2. Save your changes with `batocera-save-overlay`. This will have to be done every update.

3. Save the following file to `/userdata/system/configs/emulationstation/es_systems_famicom.cfg`:

   es_systems_famicom.cfg

```
<?xml version="1.0"?>
<systemList>
  <system>
        <fullname>Family Computer</fullname>
        <name>famicom</name>
        <manufacturer>Nintendo</manufacturer>
        <release>1983</release>
        <hardware>console</hardware>
        <path>/userdata/roms/famicom</path>
        <extension>.nes .unif .unf .zip .7z</extension>
        <command>python /usr/lib/python3.9/site-
packages/configgen/emulatorlauncher.py %CONTROLLERSCONFIG% -system
%SYSTEM% -rom %ROM%</command>
        <platform>nes</platform>
        <theme>famicom</theme>
        <group>nes</group>
        <emulators>
            <emulator name="libretro">
                <cores>
                    <core default="true">fceumm</core>
                    <core>nestopia</core>
                </cores>
            </emulator>
        </emulators>
  </system>
</systemList>
```

   - This file persists between updates. It may need to be updated if Batocera changes the cores/emulators available to the NES system, but that is unlikely to happen any time soon.

After this change, place your Famicom ROMs into a new folder at `/userdata/roms/famicom/`. Batocera will recognize it and add the Famicom to the system list.

Controls

The NES had many accessories, most of which cannot be configured inside of Batocera but can be configured in RetroArch's Quick Menu (`[HOTKEY]` + ) → **Controls**. These can be saved by saving the remap file.

Of the controllers Batocera supports configuring, the NES Zapper uses the current mouse cursor as input. This can be emulated using the Mayflash Dolphinbar with a Wiimote for a more authentic experience. Traditional Zappers cannot be supported with modern displays (they relied on reading

phosphors burning in the CRT and cannot “see” modern LCD screens).

Here are the Nintendo Entertainment System's controls shown on a Batocera Retropad:

Troubleshooting

For further troubleshooting, refer to the generic support pages.

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