

# Choose a PC

You may want to check out the [devices navigation page](#) first to ensure you're on the right page.

## A note about minimum PC requirements

Making a list of minimum requirements is really difficult for something like Batocera as it ultimately depends on how high a system you want to emulate. In a way, the minimum requirements are the minimum requires of the emulator you want to run. With that said, here are the *bare minimum* requirements needed to enjoy a smoothly scrolling menu and basic gameplay on desktop computers (in order of importance):

Minimum	Recommended
1GB of RAM	2GB of RAM, higher depending on desired system
Graphics supported by nouveau/mesa	A supported GTX/RX/HD series graphics card
A 640x480 screen	At least the resolution of the desired system
A 32-bit x86 processor	A 64-bit x86_64 processor

Note that for desktop PCs with genuinely close to 2GB of RAM, it's probably old enough that motherboard/CPU will likely only be capable of running [older versions of Batocera](#). Benchmarks are available [below](#).

## x86 desktop computers

### 64-bit PC



Pretty much every “computer” after 2010. These may also be referred to as x86\_64.



There are a small group of 2-in-1 Intel computer tablets manufactured around 2012-2015 that use a 64-bit CPU on a locked-down 32-bit UEFI bootloader, only allowing 32-bit operating systems to boot (yeah). There is no (yet) known way to check for this, aside from reading the support documents. This doesn't apply to the massive majority of



computers anyway. [Read more here.](#)

There are also a few handheld PCs on the market. Notable ones include the Aya Neo, the OneNetbook OneXPlayer and the Valve SteamDeck. Some of these devices might need specific setups to run Batocera. You'll find more information on [this page](#).

The component that will usually make or break these systems is its graphics card. In case your graphics card is not supported, the system will be very slow and unplayable. Most GPUs are supported - even integrated GPUs on modern Intel CPUs give decent results. Older integrated Intel and AMD graphics processors are more compatible, and don't need these specific drivers to function correctly (they'll usually not have a lot of performance compared to discrete GPUs though, but for retro-gaming this is a non-issue).

If you have to choose a new GPU, recent Nvidia GTX and AMD Radeon RX cards are supported well in the main Batocera image, and usually give very good results. A combination of an Intel i5 4xxx CPU + Nvidia GT1030 GPU will support all emulators up to the [PS2](#) for a reasonable cost.

## Required Accessories

- A storage medium (hard-drive, SSD, USB, anything that the motherboard can boot from)
- Keyboard and mouse (for standalone emulator configuration/light gun games, most emulators *can* be configured with just a controller though)
- Display and speakers

## Performance

The sky's the limit! Virtually **no limitation** 🤪

However, depending on your hardware (mostly CPU and GPU), the performance of the emulators can vary significantly. For some of them, if your hardware is powerful enough, you can even use upscaling to improve the rendering beyond what the original consoles were capable of. Having a powerful CPU/GPU helps for the more intensive emulators (PS2, PS3, Wii, WiiU, 3DS, etc.). Some comparative data can be found [below](#).

## 32-bit PC



Pretty old (pre-2010) computers, Batocera is all about giving new life to old technology! May also include some more recent “ultra thin/portable” netbooks (not likely, though). You can typically discover if your machine is 32 or 64-bit by researching the name of the CPU it uses. May also be referred to as x86 (without a 64 at the end). Being 32-bit, some of the newer 64-bit emulators will not work. If you have the option, try and get a 64-bit PC instead.



There are a small group of 2-in-1 Intel computer tablets manufactured around 2012-2015 that use a 64-bit CPU on a locked-down 32-bit UEFI bootloader, only allowing 32-bit operating systems to boot (yeah). There is no (yet) known way to check for this, aside from reading the support documents. This doesn't apply to the massive majority of computers anyway. [Read more here.](#)

The component that will usually make or break these systems is its graphics card. In case your graphics card is not supported, the system will be very slow and unplayable. Most GPUs are supported - even integrated GPUs on modern Intel CPUs give decent results.

Exceptionally old Nvidia GPUs (such as ones you might find paired with a 32-bit CPU) may need to use an older version of Batocera. [Batocera 5.26 \(direct image link\)](#) was the last 32-bit version to feature the legacy Nvidia drivers, [the more recent legacy build is 64-bit only](#). It's worth testing if your 32-bit computer can work with the latest 32-bit build of Batocera first, performance with the default open-source drivers may be perfectly acceptable. Support cannot be provided for older versions of Batocera, as it may have major bugs.

Older Intel and AMD integrated graphics cards are more compatible, and don't need these specific drivers to function correctly (they'll usually not have a lot of performance compared to discrete GPUs though, but for retro-gaming this is a non-issue).

If you have to choose a new GPU, recent Nvidia GTX and AMD Radeon RX cards are supported well in the main Batocera image, and usually give very good results. Just make sure your chosen GPU is compatible with your given motherboard (old ones may have a limited PCI slot length or require a “micro” form-factor GPU to fit in the case).

## Required Accessories

- A storage medium (hard-drive, SSD, USB, anything that the motherboard can boot from)
- Keyboard and mouse (for standalone emulator configuration/light gun games, most emulators *can* be configured with just a controller though)
- Display and speakers

## Performance

Pretty variable, but by virtue of being 32-bit the hardware used will be a bit older and you will be locked out of the few 64-bit emulators (mainly 6th gen and above). [Benchmarks below.](#)

## Benchmarks

These tables give you an idea of the performance you can expect with several PC configurations, with the Batocera release they've been tested with.

In order to give more meaning to the table (as most x86 PCs can run most systems beyond full speed), we've appended additional information about the emulator's upscaling capabilities if it ran at full-speed. Here is the list of possible results:

- 0 = did not run full-speed
- #% = The average speed of emulation, where # is a number
- Full-speed = Full-speed for emulators that don't support upscaling
- x1 = Full-speed at native resolution
- x2 = Full-speed at x2 upscaled resolution
- x3 = Full-speed at x3 upscaled resolution and so on until...
- Max = The highest upscaling setting available to the emulator at the time
- N/A = Not applicable, the benchmark could not be completed for one reason or another (usually explained in a footnote)
- ? = The title was not tested

All systems that did not run at full speed will either have a 0 or the average FPS (if that data was available at the time).

If you'd like more information about the comparative performance of X CPU versus Y CPU, you can look up their benchmarking scores on websites such as [Passmark](#), [Geekbench](#) and the CPU section on the community-driven comparison site [Userbenchmark](#). You may need to switch between single CPU and multi CPU to find the model you're after! For GPUs, you can instead look up the [3DMark results](#), as that puts both the CPU and the GPU to the test, or the GPU section on the community-driven comparison site [Userbenchmark](#) for direct graphics cards comparisons. For really old cards, like back in the wild-west of graphics cards before everything got standardized, you can check out [VGA Legacy MKIII](#), just note that Batocera does *not* support the majority of these cards.

If a particular CPU or graphics card is performing out of the ordinary for that card it will be noted with a footnote. This will pretty much only apply to laptops, which tend to have underclocked cycles or less execution units (both resulting in lower performance).

By default Batocera will use the open-source Nouveau drivers for Nvidia GPUs. While these are compatible with more Nvidia cards (especially older ones), they perform quite poorly compared to the official Nvidia drivers. To activate the official Nvidia drivers, [enable them in the boot config](#).



If you'd like to create your own benchmark for Batocera to put here, check out [the benchmarking for Batocera guide page!](#)

## Batocera v39

CPU	GPU	Low-end PSP (Hatsune Miku - Project DIVA)	High-end PSP (Midnight Club: L.A. Remix)	Low-end Dreamcast (MvC2)	High-end Dreamcast (Sega Rally 2)	High-end GameCube/Wii (Auto Modellista)	High-end Saturn (Sega Rally Championship)	Low-end PS2 (Sonic Riders)	High-end PS2 (God of War)	Low-end Xbox (Jet Set Radio Future)	High-end Xbox (Burnout 3: Takedown)	Low-end PS3 (Hard Corps: Uprising)	High-end PS3 (Jojo's Bizarre Adventure: Eyes of Heaven)
Intel N97 (performance-tuned BIOS)	Intel UHD Graphics 24EUs (Alder Lake-N)	Max	50% (30 FPS)	5x	1.25x	3x	Full-speed	4x	2.5x	2x	N/A <sup>11</sup>	Full-speed	N/A <sup>21</sup>
Intel N97 (power saving BIOS)	Intel UHD Graphics 24EUs (Alder Lake-N)	Max	50% (30 FPS)	4x	4x	3x	Full-speed	3.5x	92% (55 FPS)	2x	N/A <sup>31</sup>	Full-speed	N/A <sup>41</sup>

### Batocera v38

CPU	GPU	High-end PSP (God of War Chains of Olympus)	High-end GameCube/Wii (FZero GX)	High-end Saturn (Panzer Dragoon)	High-end PS2 (God of War)	High-end Xbox (Burnout 3 Takedown)	High-end 3DS (Pokemon Sun)	Low/Mid-end PS3 (Ducktales Remaster) (Warriors Orochi 3 Ultimate)	High-end PS3 (God of War 3)	Low/Mid-end WiiU (New Super Mario Bros U) (Zelda Wind Waker/Twilight Princess)	High-end WiiU (Zelda Breath of the Wild)
Beelink SER5 MAX Ryzen 7 5800H	Integrated Radeon (3GB VRAM)	4x	3x	4x	3x	2x	3x	Full-speed	25%-83% (15-50 FPS) <sup>51</sup>	Full Speed	33%-50% (20-30 FPS)
CPU	GPU	High-end PSP (God of War Chains of Olympus PSP)	High-end NDS Solatorobo: Red the Hunter NDS	High-end N64 Perfect Dark	High-end 3DS (Kid Icarus: Uprising)	High-end Gamecube (F-Zero GX)	High-end Xbox (Burnout 3: Takedown)				
Intel i7 6700	Nvidia 1030	5x <sup>61</sup>	Full-speed	6x	1x	2x	2x				

### Batocera v37

CPU	GPU	Low-end PSP (Hatsune Miku - Project DIVA)	High-end PSP (Midnight Club: L.A. Remix)	Low-end Dreamcast (MvC2)	High-end Dreamcast (Sega Rally 2)	High-end GameCube/Wii (Auto Modellista)	High-end Saturn (Sega Rally Championship)	Low-end PS2 (Sonic Riders)	High-end PS2 (God of War)	Low-end Xbox (Jet Set Radio Future)								
Intel N100	Intel UHD Graphics Xe 24EUs 750MHz	Max	5x	4x	4x	2x	Full-speed	2.25x	1.75x	2x								
Intel Core i5-12500T	Intel UHD Graphics 770	Max	7x	4x	6x	4x	Full-speed	4x	2x	3x								
Intel Core i3-8109U	Intel Iris Plus 655	?	?	?	?	4x	?	?	2x	?								
CPU	GPU	High-end N64 (Goldeneye 007)	Low-end NDS (Tetris DS)	High-end NDS (Pokemon Diamond)	Low-end PSP (Hatsune Miku - Project DIVA)	High-end PSP (God of War: Chains of Olympus)	Low-end Dreamcast/Naomi (Marvel vs. Capcom 2: New Age of Heroes)	High-end Dreamcast/Naomi (Sega Rally 2)	Low-end GameCube (Mario Kart Double Dash)	High-end GameCube (Super Smash Bros. Melee)	Low-end 3DS (Super Mario 3D Land)	High-end 3DS (Pokémon Moon)	High-end Saturn (Panzer Dragoon)	High-end Wii U (Breath of the Wild)	Low-end PS2 (Monster Hunter)	High-end PS2 (Shadow of the Colossus)	Low-end PS3 (Demon's Souls/Hatsune Miku Project DIVA F)	High-end PS3 (Red Dead Redemption)
Custom AMD Aerith APU Zen 2 <sup>71</sup>	RDNA 2	Max	2x	2x	10x	8x	Max	8x	5x	4x	2x	2x	Full-speed	Full-speed	N/A <sup>81</sup>	2x	Max	12% (5/60FPS)

### Batocera v35

CPU	GPU	Low-end PSP (Hatsune Miku - Project DIVA)	High-end PSP (Midnight Club: L.A. Remix)	Low-end Dreamcast (MvC2)	High-end Dreamcast (Sega Rally 2)	High-end GameCube/Wii (Auto Modellista)	Low-end Saturn (Saturn Bomberman)	High-end Saturn (Sega Rally Championship)	Low-end PS2 (Sonic Riders)	High-end PS2 (God of War)	Low-end Xbox (Jet Set Radio Future)	High-end Xbox (Burnout 3: Takedown)
Intel Core i5-4570	Intel® HD Graphics 4600	8x	2x	3x	2.6x	2x	?	?	2x	N/A <sup>9)</sup>	1x	N/A <sup>10)</sup>
Intel Core i5-4570	Nvidia GTX 750Ti	Max	6x	6x	N/A <sup>11)</sup>	5x	?	?	5x	2x	3x	90% (54 FPS) <sup>12)</sup>
Intel Core i3-4350	AMD Radeon RX 6500 XT	Max	8x	8x	N/A <sup>13)</sup>	Max	?	?	6x	85% (51 FPS)	1x	70% (42 FPS) <sup>14)</sup>
AMD Athlon Silver 3050e <sup>15)</sup>	AMD Radeon RX Vega 3	Max	3x	3x	N/A <sup>16)</sup>	2x	Full-speed	78% (47 FPS)	2x	58% (35 FPS)	1x	50% (30 FPS)
Intel Core i5-4670	AMD Radeon RX 6500 XT	Max	8x	10x	N/A <sup>17)</sup>	Max	Full-speed	Full-speed	6x	2x	1x	75% (45 FPS)

### Batocera v33

CPU	GPU	High-end N64 (Goldeneye 007)	High-end PSP (Midnight Club: L.A. Remix)	Low-end Dreamcast (MvC2)	High-end Dreamcast (Sega Rally 2)	High-end GameCube/Wii (Auto Modellista)	Low-end PS2 (Sonic Riders: Zero Gravity)	High-end PS2 (God of War)	Low-end Xbox (Jet Set Radio Future)	High-end Xbox (Burnout 3: Takedown)
Intel Core i3-4350	Nvidia GTX 750 Ti	Full-speed	Max	Full-speed	66.7% (40FPS)	5x	2x	1x	4x <sup>18)</sup>	66.7% (40FPS)

  

CPU	GPU	N64	Low-end GameCube/Wii (Mario Kart: Double Dash)	High-end GameCube/Wii (Auto Modellista)	High-end GameCube/Wii (Super Smash Bros. Melee)	Low-end PS2 (Kingdom Hearts)	High-end PS2 (God of War)
Intel Core i7-4790K	Nvidia GTX 1050 Ti	Full-speed	8x	7x	5x	8x	3x

### Batocera v32

CPU	GPU	Low-end GameCube (Mario Kart Double Dash)	High-end PSP (God of War: Ghost of Sparta)	PS2 (God of War)
Intel i5-2415M (Mac Mini 2011)	Intel HD 3000	1x	0	0

### Batocera v31

CPU	GPU	Low-end Dreamcast (Soul Caliber)	High-end Dreamcast (MK Gold)	PSX	Low-end N64 (Banjo-Kazooie)	High-end N64 (Goldeneye 007)	High-end PSP (God of War: Chains of Olympus)

CPU	GPU	Low-end Dreamcast (Soul Caliber)	High-end Dreamcast (MK Gold)	PSX	Low-end N64 (Banjo-Kazooie)	High-end N64 (Goldeneye 007)	High-end PSP (God of War: Chains of Olympus)
Intel Celeron N2830	Intel HD Graphics (Bay Trail) <sup>19)</sup>	1x	0	Full-speed	1x	0	0

## Batocera 5.25

CPU	GPU	DOS (PCPlayer Benchmark)	Low-end GameCube (Mario Kart Double Dash)	3DS (Super Mario 3D Land), Libretro/Citra	High-end PSP (God of War: Chains of Olympus)	PS2 (God of War)
Intel Celeron N3450	Intel HD Graphics 500	20.5	0	0	1x	0
Intel Pentium 4405U	Intel HD Graphics 510	30.9	2x	2x	2x	0
Intel Core i5-4250U	Intel HD Graphics 5000	32.9	2x	2x	2x	0
Intel Core i3-4130T	Intel HD Graphics 4400	39.9	1x	2x	2x	0
AMD Athlon 3000G	AMD Radeon Vega 3	44.4	3x	1x	3x	0
Intel Core i3-8109U	Intel Iris Plus Graphics 655	49	4x	4x	4x	0

Source:

[https://docs.google.com/spreadsheets/d/e/2PACX-1vSdHiY7S\\_vsfAnxYBpzxYXy3Civ\\_eT19xXLsGAXC5r2nGlopE4imbYDPFCHyGStuW12Ktaxu5za4mii/pub](https://docs.google.com/spreadsheets/d/e/2PACX-1vSdHiY7S_vsfAnxYBpzxYXy3Civ_eT19xXLsGAXC5r2nGlopE4imbYDPFCHyGStuW12Ktaxu5za4mii/pub)

## Batocera 5.24

CPU	GPU	DOS (PCPlayer Benchmark)	Low-end GameCube (Mario Kart Double Dash)	3DS (Super Mario 3D Land), Libretro/Citra	High-end PSP (God of War: Chains of Olympus)	PS2 (God of War)
Intel Core i5-4440	Intel HD Graphics 4600	44.9	1x	2x	2x	0
Intel Core i5-4440	NVIDIA GTX 1050	44.2	7x	0	8x	2x
Intel Pentium G4500	Intel HD Graphics 530	52.8	2x	3x	4x	0
Intel Core i3-8109U	Intel Iris Plus Graphics 655	49	3x	4x	4x	0
Intel Core i3-4360	Intel HD Graphics 4600	48.6	1x	2x	2x	0

CPU	GPU	DOS (PCPlayer Benchmark)	Low-end GameCube (Mario Kart Double Dash)	3DS (Super Mario 3D Land), Libretro/Citra	High-end PSP (God of War: Chains of Olympus)	PS2 (God of War)
Intel Core i3-4360	NVIDIA GTX 1050	48.9	6x	0	8x	2x
Intel Pentium G3220	AMD Radeon RX 550	40.7	6x	5x	9x	2x

Source:

[https://docs.google.com/spreadsheets/d/e/2PACX-1vTQ-\\_vBM4RwW4x6Ctj4dFZFAX45JoUqPs1AXG1yjiG PqOWm2vTB2BapeBjN5TyH2mMGf6xte0\\_y4ks2/pub](https://docs.google.com/spreadsheets/d/e/2PACX-1vTQ-_vBM4RwW4x6Ctj4dFZFAX45JoUqPs1AXG1yjiG PqOWm2vTB2BapeBjN5TyH2mMGf6xte0_y4ks2/pub)

### Batocera 5.23

CPU	GPU	DOS (PCPlayer Benchmark)	Low-end GameCube (Mario Kart Double Dash)	3DS (Super Mario 3D Land), Libretro/Citra	High-end PSP (God of War: Chains of Olympus)	PS2 (God of War)
Intel Core i5-4440	Intel HD Graphics 4600	47.9	1x	Full-speed	2x	0
Intel Core i5-4440	NVIDIA GTX 1050	46.2	7x	Full-speed	8x	1x
Intel Pentium G4500	Intel HD Graphics 530	55.8	2x	Full-speed	4x	0
Intel Core i3-8109U	Intel Iris Plus Graphics 655	51.4	3x	Full-speed	5x	0

Source:

<https://docs.google.com/spreadsheets/d/e/2PACX-1vQNX3998uWkXajZ-axD6dxhqcNAGu7WSshye04Q ASkiutt1LXlbwg9acAf7R7XiDItr8vis7jqjZ1Y/pub>

### Batocera 5.21

CPU	GPU	DOS (PCPlayer Benchmark)	Low-end GameCube (Mario Kart Double Dash)	3DS (Super Mario 3D Land), Libretro/Citra	PSP (Gran Turismo)	PS2 (Bloody Roar 4)
Intel Celeron 1037U	Intel HD Graphics 2500	23.6	1x	0	2x	0
Intel Pentium B960	Intel HD Graphics (Sandy Bridge)	27.5	1x	0	2x	0
Intel Celeron G1610T	Intel HD Graphics 2500	30	1x	1x	2x	0
Intel Core m7-6Y75	Intel HD Graphics 515	34.9	1x	1x	2x	0

CPU	GPU	DOS (PCPlayer Benchmark)	Low-end GameCube (Mario Kart Double Dash)	3DS (Super Mario 3D Land), Libretro/Citra	PSP (Gran Turismo)	PS2 (Bloody Roar 4)
Intel Celeron G1610	Intel HD Graphics 2500	33.7	1x	1x	2x	0
Intel Core i5-3427U	Intel HD Graphics 4000	34.5	1x	1x	2x	0
Intel Core i5-4250U	Intel HD Graphics 5000	32.6	1x	2x	3x	0
Intel Core i5-6200U	Intel HD Graphics 520	41	2x	3x	5x	1x
Intel Pentium G3220	Intel HD Graphics (Haswell)	42.3	1x	2x	3x	1x
Intel Pentium G4500	Intel HD Graphics 530	53.9	2x	3x	5x	1x
Intel Core i7-4770T	Intel HD Graphics 4600	48.2	2x	3x	4x	1x
Intel Core i3-8109U	Intel Iris Plus Graphics 655	49.6	3x	4x	8x	1x
Intel Xeon E3-1246 v3	Intel HD Graphics P4600	54.7	2x	3x	4x	1x
Intel Core i7-4790	Intel HD Graphics 4600	56.6	2x	3x	4x	1x
Intel Core i7-4790	NVIDIA GeForce GTX 750 Ti	51.9	6x	0	10x	5x

### Source

<https://docs.google.com/spreadsheets/d/e/2PACX-1vQKnVvgY9qUKveAU8JRQeJkl6NsLuTOT9jiX-MMfKhf1KyFV4GbhZQhteU2cIXy4aaUu3QjAwkDRBt/pub>

1) 3) 10) 14)

Any menu with an FMV playing does not render.

2) 4)

Crashes

5)

Framerate greatly fluctuates

6)

Occasionally dips to 50 FPS

7)

The Steam Deck, comparable to a Ryzen 3750H.

8)

Issue prevents the first mission from loading, runs at 8x in town

9)

Screen output cuts off due to bug. Unable to test.

11) 13) 16) 17)

A bug in Batocera causes framerate to only reach 30 FPS.

12)

Severe frame-drops in menus, fine once in-game.

15)

Anbernic Win600 running with no overclock, stock RAM speed and stock TDP.

18)

This may actually be lower in practice, testing level was different to other benchmarks.

19)

The **Intel HD Graphics for Intel Atom Processor Z3700 Series** iGPU in [this laptop](#) runs with only four execution units and is underclocked to 750 MHz (compared to 896 MHz), making it perform worse compared to other Intel HD Graphics (Ivy Lake) iGPUs.

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Last update: **2024/08/18 03:59**

