

Choose an single board computer

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

If you are looking to purchase a new board, you can check the available emulators for each of them on the [compatibility matrix](#).



If you hover your mouse over the links at <https://batocera.org/download>, you can see the build's file name. You might be surprised how many devices use the exact same build!

Console generations are referenced a lot throughout this. In no *particular* order:

Gen	Consoles	Handhelds
3rd	NES, Sega Master System, Atari 7800	Not yet, unless you count Game & Watch.
4th	SNES, Sega Genesis/Megadrive, Philips CD-i, Neo Geo, PC-Engine/TurboGrafx/SuperGrafx	Game Boy, Sega Game Gear
5th	Sony PlayStation, N64, Sega Saturn, Atari Jaguar	Game Boy Color, Sega Genesis Nomad
6th	Sony PlayStation 2, Microsoft Xbox, Nintendo Gamecube, Sega Dreamcast	Game Boy Advance, Nokia N-Gage, Neo Geo Pocket Color
7th	Nintendo Wii, Microsoft Xbox 360, Sony PlayStation 3	Nintendo DS, Sony PSP

There's more but that's the gist. In terms of power required to run, consider handhelds to be a generation and a half behind consoles. The Sega Saturn is a special exception, consider it a 6th gen console in terms of power required.

Raspberry Pi family

Raspberry Pi Zero



A cheap \$5 USD board. Single core ARM processor clocked at 1 GHz with 512 MB DDR2 Ram. The W/WH model has Wireless and Bluetooth built in. This version of the Pi has been continually refreshed

throughout the lifespan of the other Pi devices, the first iteration was identical to the Pi 1's specifications at 700MHz, whereas the current ones being manufactured have an upgraded 1 GHz CPU. The Pi Zero is a popular choice when used in conjunction with a [Retroflag GPI Case](#) for handheld emulation.

Required Accessories

- Micro-SD card
- Mini HDMI to HDMI cable
- A way to connect a controller/keyboard (micro-USB to USB adapter)
- USB power supply
- Possibly a USB hub if you have more than one accessory

Performance

Up to 4th gen. Some easy to run 5th gen like 2D PSX games, but most are unplayable. Certain arcade games may lag.

Raspberry Pi



A cheap \$30 USD board. The original model of the first Raspberry Pi. Basically the same specs as Pi Zero but clocked at 700Mhz. Recommended to get the B model. This board has gone through multiple revisions but the newest looks identical to later B models with the 4 USB ports. Considered discontinued, though new models are still being manufactured. Look into the newer Pi3 or Pi4 models for better emulation performance at a similar price.

Support for this device may be dropped in the future.

Required Accessories

- Micro-SD card

- Power supply
- HDMI cable

Performance

Only up to 4th gen, same as Pi Zero.

Raspberry Pi 2 Model B



A cheap \$30 USD board. The second iteration of the Raspberry Pi. Recommended to get the B model. Is very similar to the specs of the first iteration, just slightly better. This model is outdated now, get a Pi3/4 instead.

Batocera **v31** is the last build to support this device.

Required Accessories

- Micro-SD card
- Power supply (micro-USB)
- HDMI cable

Performance

Up to 4th gen, similar to the Pi Zero.

Raspberry Pi 3



Cheap \$35 USD board. The most “mainstream” Raspberry Pi available still in manufacture. Recommended to get the B+ model. You'll find most accessories/HATs/cases are only compatible with this model or lower, and is probably the easiest Raspberry Pi to find/source as of 2020. The original B model had pretty poor Wi-Fi/Bluetooth reception, but this was fixed in the B+ model.

May need active cooling for emulating more demanding systems to avoid thermal throttling.



Batocera **v31** and lower are only 32-bits for this model, despite it having a 64-bit processor. Batocera **v32** and higher are 64-bit, requiring replacing the `/boot/config.txt` with `/boot/config64.txt` if upgrading from **v31** or lower to **v32** or higher.



Batocera **v31** and **v32** have severe audio cutting-out problems. Increase the audio latency by adding the following lines to `batocera.conf`:

```
global.retroarch.audio_latency=96
gb.retroarch.audio_latency=192
gbc.retroarch.audio_latency=192
```

Required Accessories

- Micro-SD card
- High quality power supply (micro-USB) (recommended to use the official one, otherwise you'll run into issues)
- HDMI cable

Performance

Up to 5th gen, though 5th gen specifically may require active cooling to avoid thermal throttling. Can play easy-to-run PSP and Dreamcast at decent speeds, but is unplayable for most games for those

systems. Saturn is unplayable on this. If you want a more seamless experience, look at Pi4 or Odroid XU4 or N2.

Raspberry Pi 4



Cheap \$30¹⁾ USD board. The current and most upgradeable model of the Raspberry Pi, comes in 2/4/8GB RAM variants. For emulation, you don't need more than 1GB anyway, so any amount of RAM would be good. Recommended to get the B model. Support on Batocera is still young, but gets better results than the RPi3+, and will become even better over time. Pairs well with the [NESPi 4 case!](#)

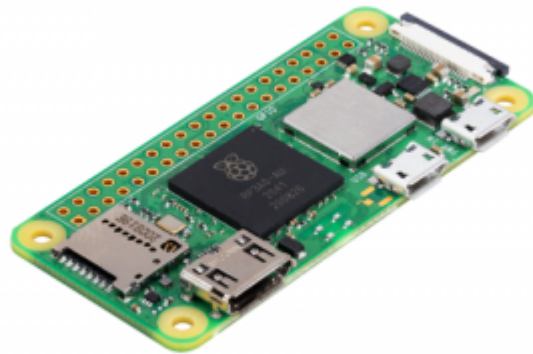
Required Accessories

- Micro-SD card
- High quality power supply (USB-C) (recommended to use the official one, otherwise you'll run into issues)
- mini-HDMI to HDMI Cable

Performance

Up to 5th gen near perfectly. A bit better than the Pi 3 all around. Can play the easy-to-run PSP and Dreamcast games. Notably the only Pi that has the Saturn emulator (correct as of v31).

Raspberry Pi Zero 2



Official support coming soon!

A cheap \$15 USD board. Its CPU is based off of the one used in the RPi 3 (ARM Cortex-A53 clocked at 1 GHz), with 512 MB LPDDR2 RAM. The W/WH model has Wireless and Bluetooth built in. The Pi Zero 2 is a popular choice when used in conjunction with a [Retroflag GPI Case](#) for handheld emulation.

Required Accessories

- Micro-SD card
- Mini HDMI to HDMI cable
- A way to connect a controller/keyboard (micro-USB to USB adapter)
- High quality power supply (micro-USB) (recommended to use the official one, otherwise you'll run into issues)
- Possibly a USB hub if you have more than one accessory

Performance



todo

Odroid family

Odroid C2



Odroid C line is similar to the Pi in terms of being an SBC the size of a credit-card, but has a slightly better amlogic S905 ARM CPU. The C2 could be considered of the same generation as the Pi 3. This device is discontinued, replaced by the C4. With that said, still good for a wide range of emulators.

Required Accessories

- Micro-SD card (unless flashing directly to eMMC)
- Power supply (5.5mm barrel jack)
- HDMI cable

Performance

Similar to the Pi 3, but slightly better. Emulates 5th gen near perfectly (except Saturn). Dreamcast performance is poor.

Limitations

CEC only works on the first HDMI port (EXYNOS driver limitation).

Odroid C4



A mid-priced \$54 USD board. The current version of the Odroid C line of SBCs. Could be considered of the same generation as the Pi 4. Uses a more powerful amlogic S905gen3 ARM CPU. Good for a wide range of emulators.

Required Accessories

- Micro-SD card (unless flashing directly to eMMC)
- Power supply (5.5mm barrel jack)
- HDMI cable

Performance

Similar to the Pi 4, but slightly better. Emulates 5th gen and easy-to-run Dreamcast/PSP games.

Odroid H2+



High-priced \$120 USD board. Technically an ordinary x86 machine, powered by Intel UHD 600 integrated graphics. Pretty large compared to other SBCs. Should work with Batocera's 64-bit build, but testing needs to be done.

Required Accessories

- SATA or M.2 drive (unless flashing directly to eMMC)

Performance

Can emulate up to 6th gen pretty well. Dreamcast, compatible Saturn games, PSP x2 resolution, GameCube all at full speed. PS2 works well with 2D games, but 3D games are less than 50% speed. [Here's a demonstration video by ETA Prime \(not using Batocera, but performance should be similar.\)](#)

Odroid XU4



Powered by the Samsung Exynos5422 ARM CPU, one of the beefier SBCs money can buy. Aside from a PC, this device is one of the best for emulating more intensive systems, only topped by the more recent Odroid N2 and N2+. However, it requires active cooling to do so.

Required Accessories

- Micro-SD card (unless flashing directly to eMMC)

Performance

Can run up to 5th gen well, comparable to the performance of the Pi 4. Can emulate up to some easy-to-run PSP games. [Here's an old demonstration video by ETA Prime \(using Batocera v5.9, performance has since improved slightly\).](#)

Odroid N2/N2+



A mid-priced \$66 USD board. Powered by the Amlogic S922X ARM CPU! Even if it's a bit larger than a Raspberry Pi, it's still very small for bartop/arcade projects. It's also much more powerful while still being completely fanless. Compared to a Raspberry Pi, the Odroid N2/N2+ doesn't provide Wi-Fi or Bluetooth out of the box (but many USB Wi-Fi and/or BT dongles are compatible).

Required Accessories

- Micro-SD card (unless flashing directly to eMMC)

Performance

This is the highest-end ARM-based SBC compatible with Batocera as of writing. Can emulate 5th gen excellently, and some 6th gen too. [Here's a demonstration video by ETA Prime](#) and [here's a GameCube emulation demonstration video by Fry Lo](#).

Odroid Go Advance/Super



Mid-to-high priced; \$60 USD for the Advance, \$80 for the Super. Based on the RK3326 ARM CPU, this is a portable handheld gaming system.

Available in several variants:

- Original [Odroid Go Advance](#) - launched in January 2020
- [Odroid Go Advance Black Edition](#) - launched in June 2020, upgraded to a USB-C power connector, added integrated Wi-Fi, and added two smallish R2/L2 additional buttons
- [Odroid Go Super](#) - launched in January 2021, with a larger 5" screen, added a right analog stick and added dedicated volume buttons (but removed integrated Wi-Fi)

The OGA has 6 buttons under the screen: from left to right

[SELECT] [VOL -] [VOL +] [BRIGHT -] [BRIGHT +] [START]

There are other handheld "clones" of the Odroid Go Advance available on the market, powered by the same SoC, that are fully compatible with the same Batocera build. For example, the [RK2020](#) and [Anbernic RG351P/M](#).

Required Accessories

- Micro-SD Card
- Wi-Fi/BT USB Dongle (internet connectivity/multiplayer for the original OGA or OGS)

LED control

Some people find the constantly flashing LEDs to be very intrusive. Here's how to turn them off:

This command will turn the blue LED to MicroSD card access:

```
echo mmc0 > /sys/bus/platform/drivers/leds-gpio/gpio_leds/leds/blue:heartbeat/trigger
```

and following one will turn it off completely:

```
echo none > /sys/bus/platform/drivers/leds-gpio/gpio_leds/leds/blue:heartbeat/trigger
```

To execute this code automatically at each startups, just put it on a text file and save it as `/userdata/system/custom.sh`

Credit to [neko](#) on the forums for this tip.

Performance

It is capable of 5th gen and below well, though N64 has issues with specific games. Has very limited PSP support, some 2D games run well but 3D games are hit-or-miss. Dreamcast is “playable”, but sub 40FPS. [Here's a demonstration video by LOE TECH.](#)

Rockchip boards

Powkiddy A12/13



There are 3 models for this board. To be able to boot this board, you may have to edit the file `extlinux/extlinux.conf` on the sdcard to switch on your model. Put a `#` at the start of the 2 models you have not to disable them. In this example, the model Rev C is enabled. Note that updates will erase this customization. So, you'll have to redo the manipulation a each Batocera upgrade.

```
# file extlinux/extlinux.conf
# Default Powkiddy A12 & A13 with 1024x600 resolution
#FDT /boot/rk3128-powkiddy-a13-rev-ab.dtb
# Powkiddy Rev C (800x480 screen)
FDT /boot/rk3128-powkiddy-a12-rev-c.dtb
# Powkiddy Rev D (800x480 screen)
#FDT /boot/rk3128-powkiddy-a12-rev-d.dtb
```

- HDMI port
- 2 USB type A ports
- 3.5mm headphone jack
- Micro SD card slot
- USB charging port
- Power button
- 3600mAh battery

The A12 has 5 buttons under the screen: from left to right

```
[ SELECT ] [ DETERMINE ] [ VOL - ] [ VOL + ] [ RETURN ]
```

ROCKPro64



A mid-ranged priced \$60 USD board. The [ROCKPro64](#) is powered by the Rockchip RK3399 Hexa-Core (dual ARM Cortex A72 and quad ARM Cortex A53) 64-bit CPU with the MALI T-860 Quad-Core GPU. This is the most powerful SBC offered by PINE64 as of writing.

Required Accessories

- Micro-SD card or eMMC module
- 12V 3A or 5A type M power supply (5.5mm OD/2.1mm ID barrel jack)
- HDMI cable

Performance



ASUS Tinkerboard



The [ASUS Tinkerboard](#) is powered by the Rockchip RK3288 64-bit ARM CPU.

Required Accessories

- Micro-SD card
- Power supply (micro-USB)
- HDMI cable

Performance



MQmaker MiQi



The MiQi is pretty cool but I don't know what happened to it. Only mention of it I can find



is Armbian's documentation on supporting it: <https://www.armbian.com/miqi/>

Powered by the Rockchip RK3288 ARM CPU.

Required Accessories

- Micro-SD card (booting from eMMC is not possible)
- High quality power supply (micro-USB)
- HDMI cable

Performance



NanoPi M4V2



A mid-range \$70 board. The NanoPi M4V2 is powered by the Rockchip RK3399 ARM CPU.

Required Accessories

- Micro-SD card or eMMC module
- High-quality 5V 3A power supply (USB-C)
- HDMI cable

Performance



Various Android TV Boxes

Amlogic S905/S905X-based TV boxes



Amlogic GXBB/GXL family boxes featuring quad-core 64-bit Cortex-A53 CPU and MALI-450 GPU. May also be known as an “Android set-top box” (STB). Support was added for these devices in Batocera **v30**. Be weary, however, that many Chinese clones have been released on the market claiming to have these chips in them when in reality they have a weaker/less capable chip that's completely unsupported. Buyer beware...



Device Tree Binary

You have to use a device specific .dtb in the FDT section of /boot/uEnv.txt file which is located on the root of your SD card. There are some DTB files included in /boot/boot, so if one does not work, try out another. Be careful, as incorrect DTBs might damage your hardware, though this is unlikely. Some boxes may require you to hold the reset button on boot to load an alternative boot loader for the first time. It is usually located under a small hole on the bottom of the box, or inside of the 3.5mm A/V jack connector. In the latter case you can use a wooden toothpick to press the button. Do not use DTB files from other sources (older Batocera.linux versions or from other distributions) as they will not work.

Tested Devices

There are a wide range of devices available on the market with various Wi-Fi/LAN/Bluetooth chipsets. If you have tested a device please report back the results and the DTB used on Discord and we will add it to this list. The version of Batocera it was tested with is noted, but any higher versions of Batocera should work fine as well. If in doubt, test the version noted here.

Model/Make	Batocera	Ethernet	Wi-Fi	Bluetooth	Tested DTB	Notes
Tanix TX3 Max	v30	Works	Works	USB only	meson-gxl-s905x-p212.dtb	

Model/Make	Batocera	Ethernet	Wi-Fi	Bluetooth	Tested DTB	Notes
TX3 Mini	v34	Works	Works	 Fix Me!	 Fix Me!	Actually uses the S905W. Still works, surprisingly.

Limitations

At the time of writing:

- Video splash is disabled
- Shutdown may not work (reboots the system)
- If your Bluetooth or Wi-Fi is not working you can add a [compatible dongle](#).

Required Accessories

- SD Card or USB stick (unless installing directly to eMMC)
- Controller/keyboard (included remote usually does not work)
- **I** UHS-I: theoretical maximum transfer speeds up to 104MB/s

Performance

Can do up to 4th gen fine, but may struggle a bit with running demanding SNES games like Starfox and other SuperFX games. Can play PSX games at full speed (even 2x res), but struggles with N64 and other 5th gen titles.

Amlogic S905X3/S905gen3-based TV boxes



Amlogic SM1 family boxes featuring Quad Core 64bit Cortex-A55 CPU and MALI-G31 GPU. May also be known as an “Android set-top box” (STB). Support was added for these devices in Batocera **v31**. Be weary, however, that many Chinese clones have been released on the market claiming to have these chips in them when in reality they have a weaker/less capable chip that's completely unsupported. Buyer beware...



The image for this in **v31** was called “s905gen3” but has since been renamed to



“tvboxgen3”. Users on **v31** will have to **manually upgrade** using this command to continue to receive updates: `batocera -upgrade`
<https://updates.batocera.org/tvbox-gen3/stable/last/>



On Batocera **v31** there is a kernel/u-boot bug that causes color distortion. There is no fix for that in **v31** but for a workaround do the following: Depending on the media you should copy the `u-boot.sd` or `u-boot.usb` file to `uboot.ext` and reboot. Batocera **v32** and above include a kernel patch to fix this issue.

Device Tree Binary

You have to use a device specific `.dtb` in the FDT section of `/boot/uEnv.txt` file which is located on the root of your SD card. There are some DTB files included in `/boot/boot`, so if one does not work, try out another. Be careful, as incorrect DTBs might damage your hardware, though this is unlikely. Some boxes may require you to hold the reset button on boot to load an alternative boot loader for the first time. It is usually located under a small hole on the bottom of the box, or inside of the 3.5mm A/V jack connector. In the latter case you can use a wooden toothpick to press the button. Do not use DTB files from other sources (older Batocera.linux versions or from other distributions) as they will not work.

Tested Devices

There are a wide range of S905X3 based devices are available on the market with various Wi-Fi/LAN/BT chipsets. If you have tested a device please report back the results on Discord. HK1BOX/Vonatar X3/H96 Max boxes are recommended starting devices. The version of Batocera it was tested with is noted, but any higher versions of Batocera should work fine as well. If in doubt, test the version noted here.

Model/Make	Batocera	Ethernet	Wi-Fi	Bluetooth	Tested DTB	Notes
A96X F3 Air	v31	USB only	USB only	USB only	meson-sm1-a95xf3-air-4g.dtb	Ethernet is actually only 100Mbit/s. Standby mode not functional.
H96 Max	v32	Works	USB only	Works	meson-sm1-h96-max.dtb	
HK1BOX aka MUB	v31	Works	Works	USB only	meson-sm1-a95xf3-air-4g.dtb	Booting into Batocera successfully from the SD card is inconsistent with the default firmware. Flashing the <code>u219.HK1_BOX_1000M_9.0.2019.12.28.11.34.img</code> firmware using the Amlogic burn tool fixes this (advanced users only, could brick your device if done incorrectly).
T95 MAX+	v32	Unknown	Works	Unknown	meson-sm1-h96-max.dtb	
Vonatar X3	v31	Works	Works	Works	meson-sm1-h96-max.dtb	
X96 Air 4GB/32GB	v31	Works	USB only	USB only	meson-sm1-x96-air-4g.dtb	
X96 Max Plus	v32	Works	USB only	Works	meson-sm1-h96-max.dtb	Booting into Batocera successfully from the SD card is inconsistent with the default firmware. Other minor SD card reading issues on v31 , fixed with v32 .

Limitations

At the time of writing:

- Shutdown/reboot may not work

Required Accessories

- SD Card or USB stick (unless flashing directly to eMMC)
- Controller/Keyboard (included remote usually does not work)

Performance

4th gen and below at full speed. Can do PSX perfectly. Struggles a bit with complex N64 and Dreamcast/PSP, but can handle easy-to-run 2D games fine.

Libretech

Libretech H5



To be filled

Required Accessories



Performance



Khadas family

Khadas VIM2



[Khadas VIM2](#) has a beefy Amlogic S912 SoC: x4 Cortex A53 performance-cores (1.5Ghz), and x4 Cortex A53 efficiency-cores (1.0Ghz) are merged into a octo-core configuration, coupled with a Mali-T820 MP3 GPU running at 600 MHz. Support was introduced in Batocera.linux **29**.

This board is powered by open source Mesa panfrost driver and therefore currently limited to OpenGL ES 2.0. Support for OpenGL ES 3 will be available when Mesa supports it on this GPU.



To use a custom resolution instead of the default one, [edit](#) `/boot/extlinux/extlinux.conf`. Otherwise, ES will reset the resolution whenever a game is exited.

For compatibility information, check <https://batocera.org/compatibility> and use s912 as reference.

Required Accessories

- SD Card

Performance



Fix Me!

Saturn is unplayable.

Troubleshooting

If board keeps booting into Android, you need to erase the onboard eMMC (sorry!). Check [VIM2 Documentation](#) for the procedure, or flash [Krescue](#) onto an SD card and boot to use the VIM itself to perform the flash. It is still possible to install Batocera onto the eMMC and to use the SD card as the

“external storage” to store ROMs on.

Khadas VIM3



Khadas VIM3 has a powerful Amlogic A311D SoC: x4 Cortex A73 performance-cores (2.2Ghz), and x2 Cortex A53 efficiency-cores (1.8Ghz) are merged into a hexa-core configuration, and fabricated with a 12nm process to maximise performance, thermal and electrical efficiency. Support introduced in Batocera.linux **5.27**.



To use a custom resolution instead of the default one, [edit](#) `/boot/extlinux/extlinux.conf`. Otherwise, ES will reset the resolution whenever a game is exited.

For compatibility information, check <https://batocera.org/compatibility> and use Odroid N2 as reference.

Limitations

At the time of writing:

- Wifi is unstable. Firmware often fails to load
- Kodi isn't enabled
- 8bitdo SN30Pro USB controller isn't always recognized
- Power-off button isn't working
- Video splash is disabled
- HDMI CEC is disabled in EmulationStation

New issues in **v33**:

- No audio
- Emulators freezing with default settings

Required Accessories

- SD Card

Performance



Troubleshooting

If board keeps booting into Android, you need to erase the onboard eMMC (sorry!). Check [VIM3 Documentation](#) for procedure, or flash [Krescue](#) onto an SD card and boot to use the VIM itself to perform the flash. It is still possible to install Batocera onto the eMMC and to use the SD card as the “external storage” to store ROMs on.

Orange Pi family

Orange Pi 4/Orange Pi 4 LTS



A modestly-priced \$50 board, one of the main competitors against the Raspberry Pi. The Orange Pi 4 is powered by the RK3399 SoC clocked at up to 2.0 GHz, its more powerful than the RPi 4 while being cheaper.²⁾

The Orange Pi 4 LTS is the slightly upgraded version of the original Orange Pi 4.

Limitations

No Wi-Fi or Bluetooth supported yet.

Required Accessories

- If not getting the eMMC option intending to flash Batocera to it, a micro SD card.

Performance



Orange Pi PC



Cheap \$30 board. The [Orange Pi PC](#) is powered by the AllWinner H3 CPU clocked at up to 1.6GHz. A customized, downgraded version of this board is used in the [Capcom Home Arcade](#). Successor to the similarly spec'd Orange Pi One.



In fact, some people have reported that the CHA image actually runs better than the intended Orange Pi PC image. Although, due to it having less RAM, the CHA image has less emulators available to it.

Limitations

No Wi-Fi or Bluetooth, dongle required or use Ethernet.

Required Accessories

- Micro-SD card

Performance

Can emulate 4th gen pretty well. Runs easy-to-run PSX games at full speed, but poor with N64. Comparable to a Pi 2.

Radxa family

Radxa Zero



A cheap \$35 board. The [Radxa Zero](#) is a small form-factor board similar in shape to the Raspberry Pi Zero, but significantly more powerful (powered by the s905gen2 SOC). Support for this board was

introduced in Batocera **v32**. Supports models  RS102-D0H and above.

Installation

The process is quite lengthy, especially if you've never flashed a Radxa device before. Visit [its own installation page](#) for the detailed steps.

Required Accessories

- Micro-SD card (unless flashing directly to eMMC)
- Power supply (USB-C)
- Micro HDMI to HDMI cable

Performance



Beelink TV Boxes

GT King/GT King Pro



todo box



Features a S922X chipset, so performance should be identical to the [Odroid N2/N2+](#).

For installation, follow [the instructions on its dedicated page](#).

Other SBCs

By technical definition, [laptops](#), [USFF/NUCs](#), [handhelds](#) and some x86 small form-factor boards are SBCs as well, but this page focuses more on the “stationary lightweight” ones.

Choose an micro SD card

For Batocera, any sort of flash storage will do. After all, it can run from USB 2.0 ports which is far below the transfer speed of nearly all micro SD cards available for purchase today.

However for those interested in the specifics, a comprehensive guide to SD cards can be found on [Kingston's shopping blog](#). Understand the meaning of all those letters found in the microSD specs!

1)

Prices have since changed due to market conditions...

2)

As of 2022, due to the price increases of the RPi 4.

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