Guide

What computer to buy for PC retro gaming? (August 2024)

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What computer to buy for PC retro gaming?

First you must identify what you'll do with your computer. Second, you must understand the concept of how to budget versus the hardware needed for your approach otherwise the price will increase dramatically because of subtleties making your PC very slightly better for your use. And third, what hardware that you got that you intend to keep?

Let's explore the first! If you intend to focus your computer on PC retro gaming exclusively, then you should always focus on how your CPU will perform in single core. Which means, that you should avoid recommendation that you see all over YouTube from big channel recommending you to buy a lower CPU to have a better GPU. Since there's the GPU have little to no impact. And also take in consideration that in single core you will have no advantage of using an X3D cache CPU these X3D CPU are actually made for games that are multi-core, but since PC emulator such 86Box and DOSBox are exclusively single core, you'll get no advantage to have density of treatment. Focus instead on single thread of performance.

Now that being said, if you also intend to do virtual machine (which is not the same things as emulation) then there yes, the multi-core thread performance might give some advantage, but keep in mind you cannot go faster than the OS itself, so no need to think about the amount of thread, but to think about the performance in multi-thread in that case scenario, the X3D cache CPU might be a good choice since it will reduce latency reading in-between core. Which means, a 16 cores CPU won't necessarily be better in VM multi-core than an 8 cores. And in that scenario you also don't need a great GPU. Well some, VM make some use of GPU protocol, but it doesn't require any particular performance, so any slow GPU as long you're in PCI Express will do the job as long they have the protocol for. Which GPU have these protocol? If you buy a modern GPU, even the cheapest one will all have them.

If you intend to do a general usage, meaning you'll PC retro gaming on emulator, VM but you might also be willing to play modern blockbuster games, then there my main recommendation is to figure which one you'll play the most. If you think about 90% modern gaming and 10% retro gaming, then I will say focus on buying a GPU made for performance. If you think about 50% modern gaming and 50% retro gaming, then I'll say focus on buying a good GPU that produce less heat than top GPU, so a GPU that consummate less wattage. Like this, you'll be able to balance the temp in your computer case which will allow you to use the boost of your CPU which will help you when you'll be using 86Box and VirtualBox. So at the same times, you'll be able to have great performance in blockbuster games without downgrading too much your experience in PC retro gaming.

If you intend to do video editing and/or capture to capture your retro gaming session, then there, for your GPU go toward NVidia (or NVIDIA like modern people say) and there yes, the amount of core will be important. But be aware of a trap, a CPU that consummate too much need better ventilation which mean not only you'll have to pay more for a proper GPU and CPU, but it'll also sky rock the price of your total machine!

Now let's explore the second point, the budget! The purpose here is not to show what exact piece to buy, but to show the orientation you should go in-between an optimal one versus what should be considered as a normal one for the approach based on August 2024 standards. These comparisons should give you an idea of what to expect as budget if you seek an optimal one versus a normal one.

PC retro gaming emulator exclusively

Optimal version

CPU: AMD Ryzen 7 9700X or Intel Core i9-14900K (There the 9700x will have better performance and be more economic for that SPECIFIC scenario)
CPU Heatsink: Noctua NH-D15 G2 LBC (if you use AMD) or Noctua NH-D15 G2 HBC (if you use Intel)
Motherboard:
- AMD: Any B650/X670 motherboard as long they have proper heatsink on the VRM! B650 are usually more economic, but some tend to not have a proper heatsink on the VRM. A MSI PRO B650M-A WIFI would be a good choice, while a ASRock B650M-H/M.2+ will provoke some occasional stutter because of the VRM.
- Intel: Any B660/B760/Z690/Z790 motherboard as long they have proper heatsink on the VRM! ASRock B760M Pro RS would be a good choice, while a Gigabyte B760M C will provoke some occasional stutter because of the VRM.
Ram: No need to have a high bandwidth ram here, what you need it's a ram with a low latency. A 6000 mhz with a CAS of 30 is ideal for this scenario.
- AMD: CMK32GX5M2B6000Z30 is a good example of ideal ram. Since it natively have the EXPO set to these setting.
- INTEL: CMK32GX5M2B6000C30 is a good example of ideal ram. Since it natively have the XMP set to these setting.
Storage: Always use a SSD, no matter what the reason never emulate on a HDD unless you want to rage. However, no need to go to high SSD performance, you just need a drive that is reactive.
GPU: Any GPU, you can take the one that cost the less as long it's not older than 15 years and ideally low power usage/heat.
Case: A airflow case. Corsair 4000D Airflow is a good example of proper case. In that case scenario no need to go for a more expensive case since you don't have to fight any major heat from your GPU.
Power Supply: Always use a reliable PSU brand. Ideally Corsair, Seasonic, Be Quiet!. Avoid EVGA, Thermaltake, Gigabytes and Cooler Master since they have abnormally high return rate.

Cut the fat version; A proper intel economic don't exist in THAT scenario.

CPU: AMD Ryzen 7 7600X
CPU Heatsink: Thermalright Peerless Assassin 120 SE
Motherboard: MSI PRO B650M-A WIFI
Ram: PVV516G520C36K
Storage: Patriot P300 1Tb
GPU: Any GPU, you can take the one that cost the less as long it's not older than 15 years and ideally low power usage/heat.
Case: Thermaltake Versa H15
Power supply: Corsair CX 550W or Seasonic S12III 500W

VM Machine retro gaming!

Optimal version

CPU: AMD Ryzen 7 7800X3D or Intel Core i9-14900K (For VM, Intel have a net advantage not because of the performance, but for the compatibility features. But it is also a lot more expensive, so ideally in that scenario I would go for the 7800X3D because of the price but if your budget is unlimited, the 14900K is the better choice here!)
CPU Heatsink: Noctua NH-D15 G2 LBC (if you use AMD) or Noctua NH-D15 G2 HBC (if you use Intel)
Motherboard:
- AMD: Any B650/X670 motherboard as long they have proper heatsink on the VRM! B650 are usually more economic, but some tend to not have a proper heatsink on the VRM. A MSI PRO B650M-A WIFI would be a good choice, while a ASRock B650M-H/M.2+ will provoke some occasional stutter because of the VRM.
- Intel: Any B660/B760/Z690/Z790 motherboard as long they have proper heatsink on the VRM! ASRock B760M Pro RS would be a good choice, while a Gigabyte B760M C will provoke some occasional stutter because of the VRM.

RAM: Here aim fast density of treatment before aiming latency. Which mean in THAT particular scenario, higher bandwidth is more important than having a low CAS latency. As much for AMD and Intel I would recommend this one PVV532G640C32K.
Storage: Always use a SSD, no matter what the reason never VM on a HDD unless you want to rage. However, no need to go to high SSD performance, you just need a drive that is reactive.
GPU: AMD Radeon 7600 or NVidia GeForce RTX 4060
Case: A airflow case with an intake fan on the front aiming at the videocard and an exhaust fan on the back next of the CPU. Corsair 4000D Airflow but add one 120 mm fan a Noctua S12A would be an awesome choice for the intake fan.
Power supply: Always use a reliable PSU brand. Ideally 650 watts to allow futur expension. Corsair, Seasonic, Be Quiet! are good reliable brand. Avoid EVGA, Thermaltake, Gigabytes and Cooler Master since they have anormaly high return rate.

Cut the fat version

CPU: AMD Ryzen 5 5600X3D or Intel i5-12400F
CPU Heatsink: ID-COOLING SE-903-XT
Motherboard: AMD: ASRock B450M PRO4 R2.0 Intel: ASRock B760M Pro RS
Ram: AMD: PVS416G300C6K Intel: PSD516G4800K
Storage: Patriot P300 1Tb
GPU: ASRock RX6500XT CLI 4G
Case: Thermaltake Versa H15
Power supply: Corsair CX 550W or Seasonic S12III 500W

General usage

90% modern gaming / 10% retro gaming

CPU: AMD Ryzen 5 7600 or Intel i5-14400F
CPU Heatsink: ID-COOLING SE-903-XT
Motherboard: AMD: ASRock B650M-H/M.2+ Intel: ASRock B760M-H/M.2
Ram: AMD: FLBD532G5200HC40CDC01 Intel: PSD532G4800K
Storage: Kingston Fury Renegade 2 TB
GPU: AMD: Radeon RX 7800 XT or NVidia: RTX 4070 Super
Case: Fractal Design Pop Air
Power supply: Corsair RM750e or SeaSonic FOCUS GX 750W

50% modern gaming / 50% retro gaming (Intel is no match in that category)

CPU: AMD Ryzen 7 8700G
CPU Heatsink: Cooler Master Hyper 212
Motherboard: Gigabyte B650 EAGLE AX
Ram: F5-7200J3445G16GX2-TZ5RK
Storage: Kingston Fury Renegade 2 TB
GPU: None (since the 8700G is a APU)
Case: Corsair 4000D Airflow
Case fan: Noctua S12A (for the intake to put on the front aligned with the CPU)
Power supply: Be quiet! Pure Power 11 400W

Video editing and/or capture (for PC retro gaming capture purpose)

CPU: AMD: Ryzen 9 9950X (use the last Windows version for max performance) Intel: Core i9-14900K
CPU Heatsink: ID-COOLING FROZN A720
Motherboard: AMD: MSI MAG X670E TOMAHAWK WIFI Intel: MAG Z790 TOMAHAWK WIFI
Ram: F5-6400J3239G32GX2-TZ5RK
Speed SSD: Crucial T705 W/Heatsink 1 TB
Storage SSD: TEAMGROUP MP44 8 TB
GPU: RTX 4080 Super
Case: Fractal Design Torrent
Case fan: Noctua A14 (for the exhaust to put in the back aligned with the CPU)
Power supply: AMD: Corsair RM850e Intel: Be quiet! Pure Power 12 M 1000 W

Now, let's explore the third point, the hardware you keep! Let's take by example, if you have a monitor that goes up to 75 hz in 1080p then it means that if you opted for a good GPU it might be overkill, so you should reduce your GPU which will make you economize for the same amount of performance since your monitor won't be able to fully perform at the level of your GPU. And also if you reduce your GPU you will normal get better temps.

If you already have a top notch PSU from a previous build you might get tempted to keep for your build. Which, I recommend to do, but be sure that your PSU output is enough versus your build. So if your build is made to have a 650 watts at full intensity, it means that you should have at minimum a 850 watts PSU for the handle of bad ripple that happen much more often than what a lot might think.

Your previous storage and hard drive, if you keep them, be sure to not use them as C drive. Since they have been use their lifespan might be more advanced that what you think. And the "health" check in Windows is not a reliable way to know if your SSD/HDD is about to die or not. Always have a NEW drive for the C. However, for secondary drive it's ok yes, I encourage you to keep them.

You got ram from a previous build, should you keep it? NO! Rams degrade must faster than your SSD/HDD. So even if you do a RAM test that is ok, keep in mind that it's in constant use and its lifespan is probably near the end when you'll "excavate" your previous build!

What about the CPU Heatsink? That's a touchy subject. I tend to say that yes that's a good idea to keep your old one, but keep in mind that a fan have its limit, so you might be wanting to change the CPU fan on your heatsink, which at the end, it's not that much economic if compared to buying a new one.

The old computer case can I keep it? Normally, yes, be sure to watch that it have the holes to handle the motherboard format spacer that you have chosen. By example, some micro atx case doesn't have the holes for the ATX motherboard. But usually an ATX case does have a micro atx format spacer.

So that's it! I hope this guide has helped you to make a proper choice to build your retro gaming PC of your dream!

Thanks,
Napostriouf Sar
Nap'n'Retrogaming

F.A.Q.

(Or might potentially be asked!)

Question: Why did you make this guide?
Answer: Because I got often asked what PC part should be optimal for retro gaming like I do on Nap'n'Retrogaming channel. And also because a lot of people sadly fall for some of the big tech YouTubers trap who shamelessly trick and dictate these people that they should buy a lesser CPU and focus on GPU for gaming without making any nuance on how their charts works. Which have a very negative (to not say insanely negative) impact on the budget of people in the long term that good be easily avoided by getting proper recommendation. Keep in mind a good CPU is usually in the "game" for about 7 years. While a good GPU is usually in the "game" for about 1 to 2 years depending what you do with. And a GPU cost much much more than a CPU. Which means if you buy a lesser CPU that will be in the "game" for about 3 years because you put all of your budget on the GPU, well you end up paying more for a shorter time without any getting any benefit from this. And worst, you'll have less performance on what you do which in this case is PC retro gaming.

Question: You seem angry about some big tech YouTubers, do you have any recommendation to who I should follow?
Answer: Well here it depends what interest you. Personally to keep myself up-to-date with the modern and old tech in the modern days the YouTubers I prefer are @AncientGameplays, @KitGuruTech, @DawidDoesTechStuff and @RandomGaminginHD. I don't necessarily agree with everything they say, however in my opinion, they are the kings at nuance and they are always open to explore farther than simply going with the norm, which is why their videos are good for learning the intricacies in things and developing skills. Right now, none of them are big tech YouTubers, since they have no convergence together to get promoted as crossover. Which I think it's a good thing as they keep their uniqueness of their own kind! Well, as long they can financially continue with their passion.

Question: Is it any YouTubers that I should avoid?
Answer: Short answer no! Despite my extremely poor opinion of big tech YouTubers such @GamersNexus, @Jayztwocents, @TheVerge, @LinusTechTips, @mkbhd, @Bitwit and @Hardwareunboxed, they still great entertainers who are good at promoting modern tech. Which means they have their uses, since their presence makes the industry economically viable, which helps to create pluralize category of products. That being good at promoting modern tech, it also means that their opinion goes where their pockets are. And despite they all claim to be INDEPENDENT network, they all converge in the same direction aka they created indirectly a network of big tech YouTubers with constant crossover. When one says something nobody ever tries to challenge the others, because challenging is not good for advertising. Which is why the narrative always follow they same pattern which is sad, because a ton of people fall in the trap and they end-up paying for things they wouldn't even want because they see fake unanimous opinion as factual, which YouTubers with nuances prove them wrong.

Question: In the budget section of this guide, I was expecting numbers, but I only got comparisons and recommendations. Did I miss something?
Answer: The reason why I don't use numbers, it's because internet is international, so not everywhere prices are the same. Instead, I decided to focus on what type of hardware you need versus the approach.

So like this, when you will search the inventory of your local store, you'll be able to figure out what to prepare as budget versus what YOU want and/or need.

Question: This guide is from August 2024. Will you make another one in the future?
Answer: Maybe! It will depend how things will go and if novelty makes it worth to talk about in a new document! But if I don't, you can indeed transpose almost everything in this guide for pieces that currently don't exist. I mean, the logistic about how to choose hardware will normally stay essentially the same! At least for the new few years, maybe after it'll change. And if it changes, well I might indeed have to do another guide!

Question: I do video editing and streaming all the time. I don't need a such powerful PC! Why are you recommending a top notch PC in that section?
Answer: The idea there it's to explain what OPTIMIZE the approach. Obviously, what is optimal can (and probably should if you don't have an unlimited budget) be reduced and still have great performance. In the video editing particular case, the idea of the example is to show that you got major advantages if you got a good GPU and CPU especially when will come the time for encoding LONG video. Obviously, if you do 5 minutes videos, then in my opinion you shouldn't consider your PC as a video editing PC. You should go more on the general usage approach but with an NVidia card instead of AMD (because of some absent features for that purpose in AMD cards).

Question: Why are you constantly writing NVidia instead of NVIDIA like the official guidelines states it should be named?
Answer: Because back in the days, NVidia were branding their name with the "NV" and they were putting it everywhere they could. Even in words where the NV didn't fit! Just take a look in 1996's web archive to see what I'm talking about. And since, Nap'n'Retrogaming channel is about retrospective, well, I use the vintage naming scheme to remind its history. So yes, it's accurate to say NVidia, whatever NVidia tries to dictate you to say. To me NVidia will always be NVidia.

Question: Any music recommendation while reading this guide?
Answer: Sons of Butcher, here's a playlist I've made with songs from their official channel: https://music.youtube.com/playlist?list=PLswCD6pRuS3he39UjeQAlCHzRvdj9Me03&si=_k2_ZvXjcZhEQpJB