How to Assemble Your Own Computer

Introduction/Overview:

Welcome to our step-by-step guide on assembling your very own computer. Whether you're a tech enthusiast or a complete beginner, this guide will walk you through the process of selecting compatible components and putting them together. Building a computer may seem daunting, but with our instructions, you'll find its easier than you think.

What You'll Need:

Here is a quick list of the things you will need through the process. They will be in two categories, **PC Parts,** and **Tools.** The Main list will be for the components that will make or break the computer, they are necessary to buy. The Extra components will be items that will be used during the build. I will post a link to the parts I will use in my guide below. This list will be for a moderately priced PC, specifically geared for gaming. However, it will be able to do just about anything you need a computer to do.

- **PC Parts List**:
    - Processor (CPU)
        - **AMD Ryzen 5 5600X**
    - Cooling System (CPU cooler/fans)
        - **Stock Cooler**
    - Motherboard
        - **MSI MAG B550 TOMAHAWK**
    - Graphics Card (GPU)
        - **MSI GeForce RTX 3060**
    - Memory (RAM)
        - **32GB Corsair Vengeance**
    - Storage (HDD/SSD)
        - **Samsung 970 Evo Plus 2TB M.2**
        - **Seagate Barracuda Compute 2 TB 3.5" 7200 RPM**
    - Power Supply Unit (PSU)
        - **Corsair CX650M**
    - Computer Case
        - **NZXT H5**
    -
- **Tools**
    - Screwdriver
        - Standard Flat and Phillips head
    - Anti-static wrist strap
    - Good Lighting and Space

Safety:

Computer components can be very pricey, depending on what you get. Here are some tips on handling your components to avoid accidents that can lead to faulty components.

- Always have the Anti-static wrist strap on when handling components.
  - This strap ensures that no static electricity will travel from your body to the components, protecting them from potential damage.

- Ensure that the computer is unplugged from the power source throughout the assembly process.
  - If the machine is plugged in while you are touching the sensitive circuit boards, a static discharge is more likely.

- Refer to the manufacturer's instructions for each component.
  - If you get confused, its never a bad idea to refer to the manufacturer instructions. This can help you gain a better understanding of each individual component.

Quick Start Guide:

If you already have experience building PCs, you can follow these abbreviated steps to help keep things in order:

Steps:
1. Prepare your workspace and tools.
2. Install the CPU and RAM onto the motherboard.
3. Mount the motherboard and power supply inside the computer case.
4. Connect all easily accessible cables.
5. Install the GPU, storage drives.
6. Connect the rest of the cables.
7. Double-check your connections.
8. Power up your computer and install an operating system.

Comprehensive Guide:

Now we'll go more in depth into the whole process. We will discuss what each component does, and its importance in the performance of your computer. Next, we'll discuss how to put everything together. Finally, we will discuss the final steps and troubleshooting the most common issues.

Selecting Compatible Components:
○ Research your computer's intended use (e.g., gaming, productivity, content creation). We will be using the parts listed above, and a link will be provided to take you to the list on a website called PCPartPicker.
○ **List**: https://pcpartpicker.com/list/2Ky6rv

CPU: AMD Ryzen 5 5600X
We chose the **AMD Ryzen 5 5600X** for this build, it is a 6 core CPU, with decent speed for just about anything you can throw at it. It isn't the best you could buy, but it is a very capable processor for the price.

GPU: GeForce RTX 3060
GPU's can be a little tricky because pricing changes frequently. As of making this guide, the **GeForce RTX 3060** can be found for a decent price, around **$300,** and it will be able to run any game at 1080p.

RAM

Any process you run on your computer will use a little bit of the Memory. You can look at it like this, the more memory your PC has the more your computer will be able to handel at the same time. So, I would recommend at least **32GB of DDR4-3600MHz RAM.** My usual go-to brand is **Corsair,** but the
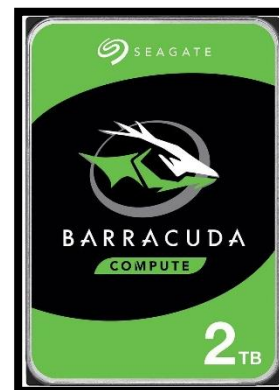
brand doesn't really matter too much.

32GB DDR4-3600MHz

SSD: Samsung 970 Evo Plus 2TB M.2　　　　**HDD: Seagate Barracuda Compute 2 TB 3.5"**

7200 RPM

Storage

SSD is all digital, so speeds are faster than HDD, as HDD has a mechanical disk that spins inside of it. However, SSDs are usually more expensive at the GB/Dollar. So, I would recommend a **2TB SSD** and adding a **2TB HDD** if necessary. This will provide a good balance of speed and storage for all your games and Programs, while not breaking the bank.

PSU: Corsair CX750M
This Power Supply is Semi modular, which means it will have the necessary wires attached, and some will have to be attached. I find this is better for a beginner, since it will be less for the builder to think about and potentially get wrong while building.

Case: NZXT H5
The case comes down to personal preference. However, there are some things you'll want to pay attention too. If you want to show off your build after, then I would recommend a nice glass side panel. Another important thing is the space the case has for the wires between the back panel. My personal preference is the **NZXT H5.** NZXT has never let me down before, so I can't recommend it enough.
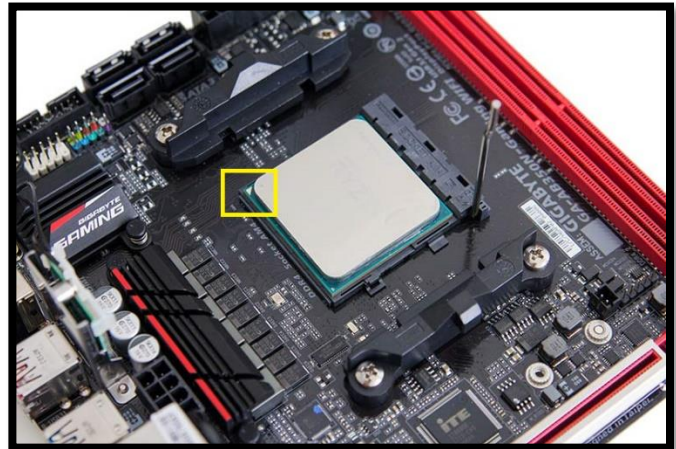
Assembling the Computer:

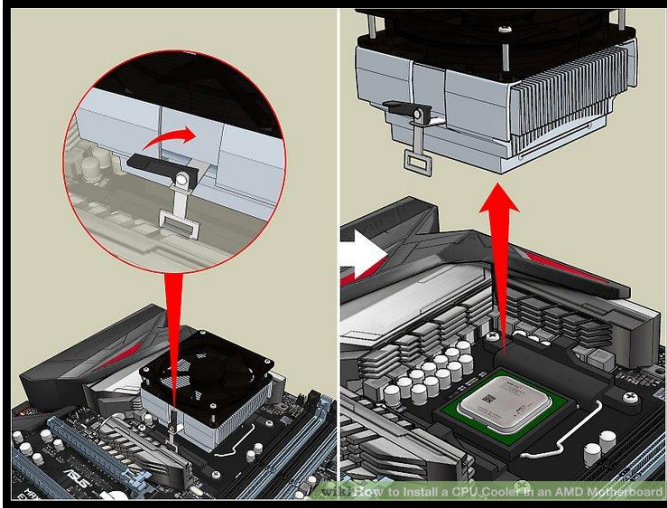1. Install the CPU and CPU Cooler:

Lift Latch on CPU socket.
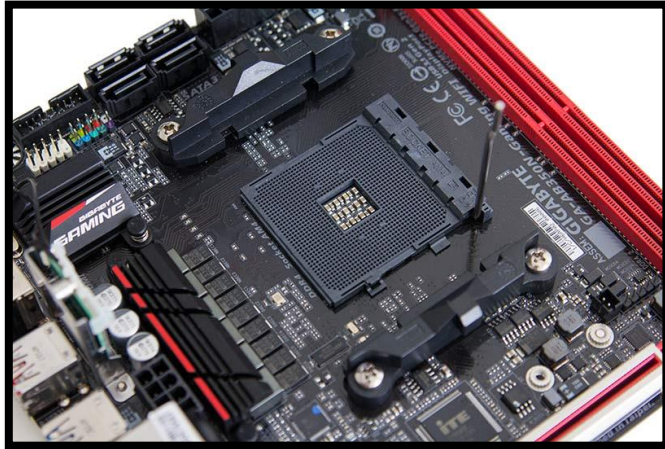
Gently place the CPU into the socket
- The gold triangle aligns with notch on Socket   *(On bottom left corner)

Secure the CPU by locking the socket.

Attach the CPU cooler, ensuring it's securely fastened.

• Apply thermal paste (if not pre-applied) to the CPU.

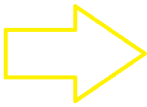Connect the CPU fan cable to the motherboard.

- Attach to CPU fan plug.

2. Attach the RAM Modules:

- Open the RAM slots on the motherboard.

- Align the notches on the RAM sticks with those on the slot.

- Gently push down on the RAM sticks until the retention clips snap into place.

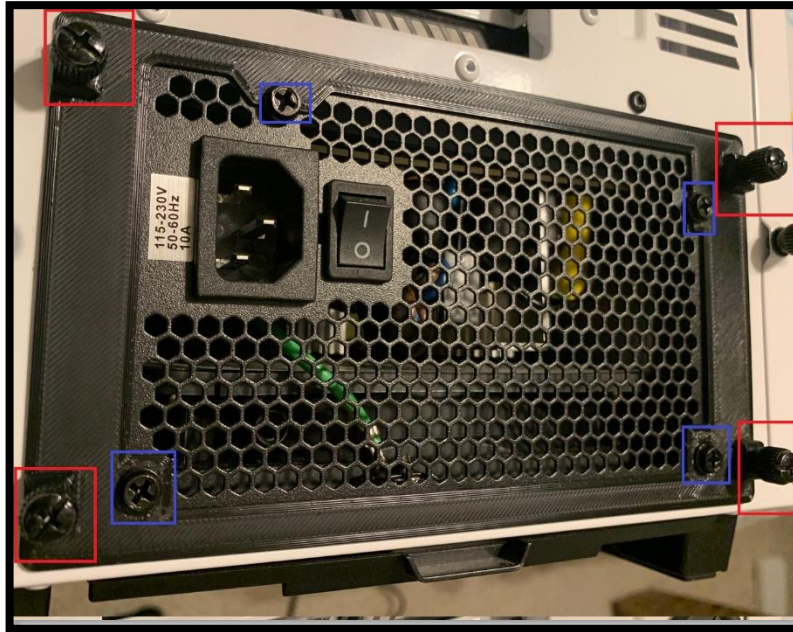3. Mount the Motherboard Inside the Computer Case:
   - Place the motherboard into the case, aligning it with the standoffs.
   - Secure the motherboard to the case using screws.
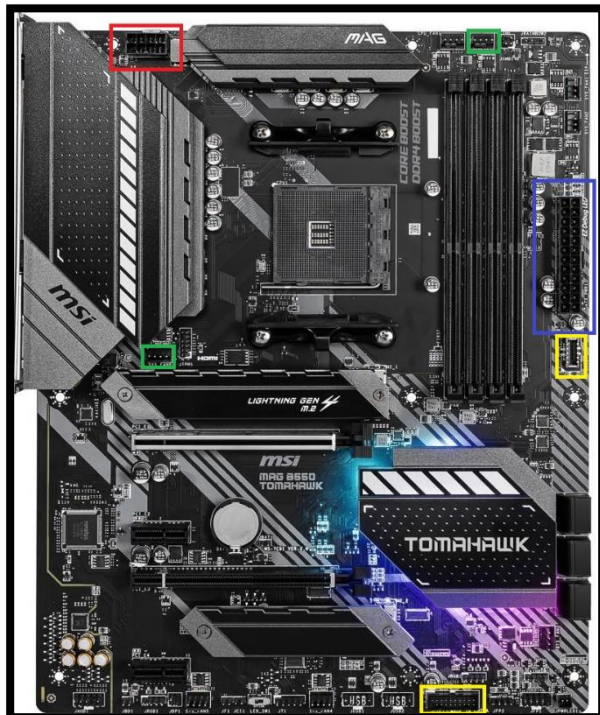
4. Install the PSU:
    - Screw PSU Bracket to PSU
    - Slide the PSU into its designated space in the case.
    - Secure it with screws.

*Bracket to Power supply   ***Power supply to case**

5. Attach Easy-to-Reach Wires:

- Connect the necessary power cables to the motherboard from PSU
- Connect the front panel connectors (power button, reset button, LEDs, USB, etc.) to the motherboard.
- Connect the case fans to the motherboard or PSU.

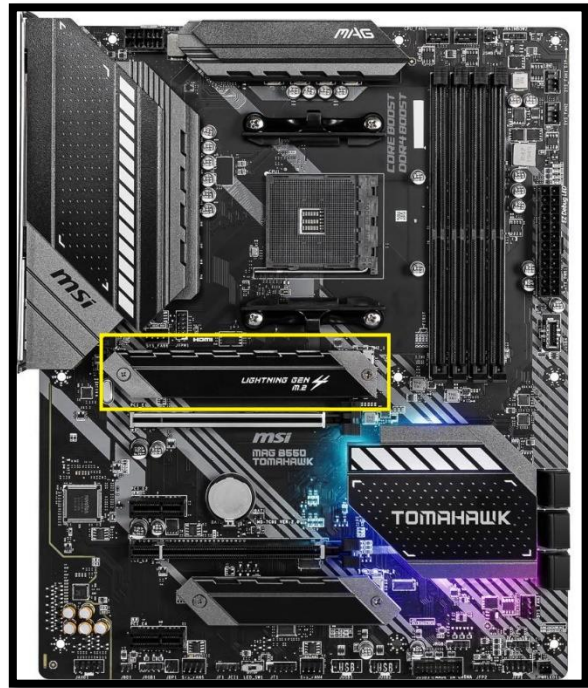***Front Panel Connectors (Consult Motherboard Manual)**

*Fan connectors

*CPU connector

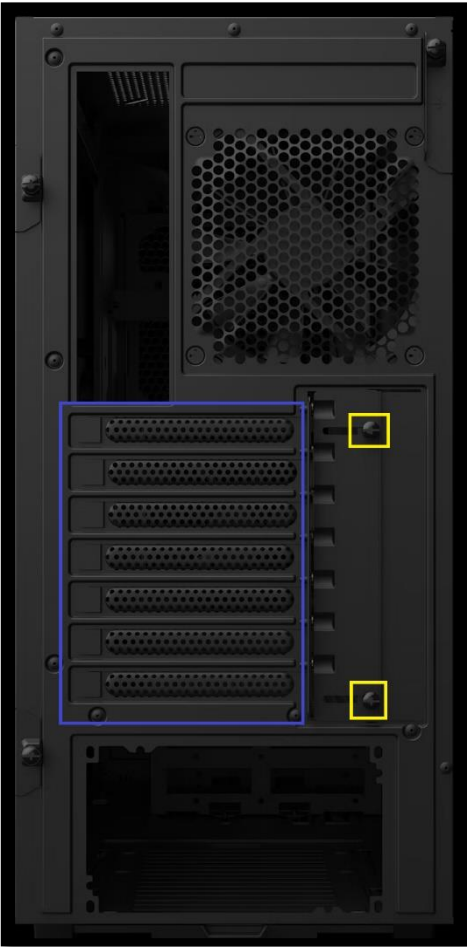***24-PIN Power connector**

6. Install Storage Drives:

    - Unscrew M.2 Cover

    - Plug M.2 Drive in

    - Screw M.2 Cover back on

7. Install the GPU:

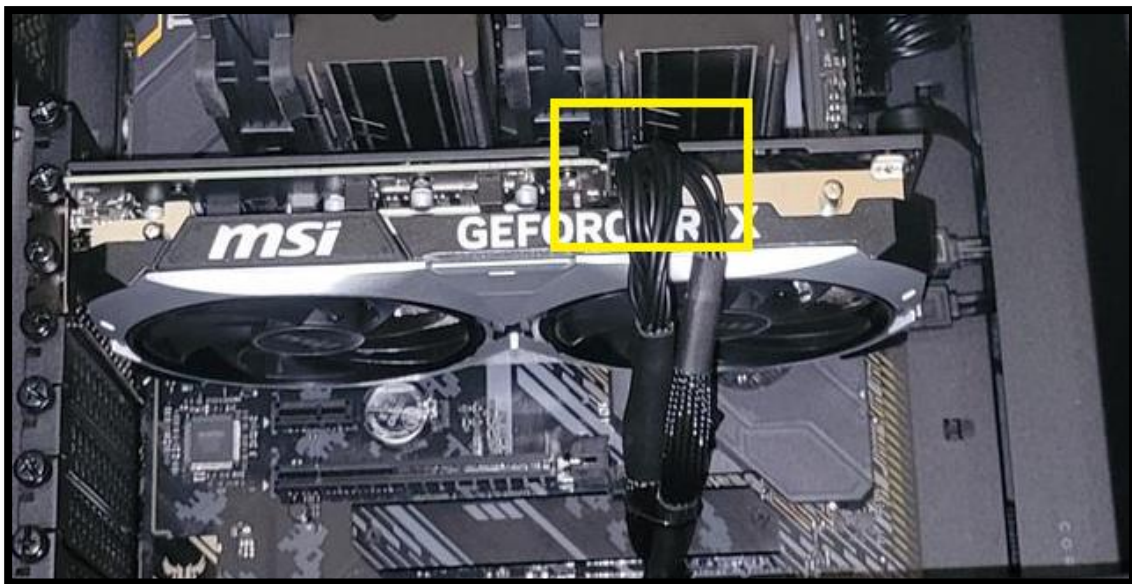

- Loosen Back panel screws behind motherboard.
- Remove Back panel card slots for GPU.

- Open the PCIe slot on the motherboard.
- Carefully insert the GPU into the slot, ensuring it clicks into place.
- Tighten screws securing GPU to case.

- Connect Wire Labeled **PCI-E** to **GPU**

8. Double check that all components are secure:
   - Ensure that all components, including the motherboard, GPU, storage drives, and PSU, are securely fastened to the case.
   - Ensure all cables are properly seated in sockets.

9. Manage cables as well as possible:
   - Neatly route cables to ensure good airflow and aesthetics.
   - Use cable ties or Velcro straps to bundle and organize cables.
   - Avoid blocking airflow paths or components.

10. Power On and Test:
    - Connect your monitor, keyboard, and mouse.
    - Turn on the computer and check if it boots into the BIOS/UEFI.

11. Install the Operating System:
    - Use a bootable USB drive or optical disc to install your chosen operating system.

Conclusion:

Congratulations, you've successfully assembled your own computer! Building a computer can be a rewarding experience, and it's now ready to serve your needs, whether it's for work, or entertainment. If you encounter any issues, don't hesitate to consult manufacturer documentation, or seek assistance from online communities, such as reddit and YouTube. Most computer component manufacturers have excellent customer support in my experience, so also don't hesitate to reach out to them if a component seems to be malfunctioning.

Thank you for Following my Guide.