

# How to Pick a DAW Computer

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If you're making and recording music in this day and age, you are probably using a computer. For most recording artists (and studios) that computer is the **focal point** of the entire recording and production process. As a result, the acquisition of a new music computer (which for the purposes of this guide I will simply call a 'DAW [digital audio workstation] computer') involves careful thought and research.

Unfortunately, the computing requirements of musicians are not the same as those of gamers, visual artists, office workers, or really any other class of user. While helpful information can be gleaned from mainstream sources such as [PC World](#) or [PC Magazine](#), most computer manufacturers, retailers, and reviewers ignore the DAW market. This guide is intended to fill in the blanks and help you, the prospective buyer, understand which features and components are important and which are not.

## I. Mac vs. PC

The central decision in purchasing a new computer, DAW or otherwise, is whether to get a Mac or a PC. Unlike some of the other decisions you'll be making in the process, there is no middle ground here. There are tons of resources on and off the web extolling the virtues of Macs or condemning Steve Jobs and everything he touches, so I won't do an in-depth analysis here. Instead, I'll touch on the some important considerations for recording artists and music producers specifically.

### PCs

- \* Much more **flexible customization**; limitless hardware configurations are possible.
- \* Almost **universally cheaper** than Macs, especially in the laptop market.
- \* **Easier to repair** and upgrade without 3rd party help.

### Macs

- \* **Higher resale value**, particularly for laptops. This is important if you like to upgrade your computer regularly.
- \* Capable of running **Windows as well as Mac OSX**, whereas PCs cannot run Mac OSX.
- \* **Very strong warranties** (AppleCare) and tech support (via Apple Stores / Genius Bar)

I won't get into the debate between OSX and Windows, as that really can't be summarized in just a few bullet points. It's almost moot these days since Apple computers can all run Windows now anyway! Simply put, if you've been using Windows and Windows only for most of your life, and there isn't any

software on OSX you're interested in, don't get a Mac. Likewise, if you love Logic and Digital Performer and can't live without them, it's probably **unwise to force a switch**.

## II. Laptop vs. Desktop

In recent years, the distinction between laptops and desktops has diminished in terms of their underlying hardware. Laptops have gotten lighter, cheaper, more powerful, and more efficient, which means they are now serious contenders to desktops even as a primary rig. Of course, the **key consideration** in this decision is still **portability**. Do you *need* to use your DAW computer in multiple locations? Do your live performances require a computer? If you answered yes to either of these questions, then a laptop is your only real option. It's possible to move around desktops, particularly those with small form factors, but it's infinitely easier to just use a laptop.

If you don't necessarily plan on moving your computer all the time and you don't need it for live performances, **you shouldn't rule out a laptop** immediately. Desktops typically take up much more space, consume far more power, and have worse resale value. Many musicians, including some I personally know, have migrated to laptop-based production and haven't looked back. They're great if you're doing mostly smaller compositions or recordings - no massive orchestral templates, no huge plugin counts, no 24 simultaneous tracks of recording.

So, why would you want a desktop instead? The main reason is that you get **more power for less money**. No matter how cheap any given laptop is, a desktop with the same specs will be cheaper. Some desktop configurations are not even possible (or prohibitively expensive) on laptops. If you need a lot of processing muscle, storage space, memory, and graphical output (ie. multiple monitors) then you'll want a desktop. Plus, a studio built around a desktop usually ends up looking like NASA Mission Control, and who doesn't want that?

## III. Prefab vs. Custom

The third of the major decisions in the computer acquisition process is whether to buy one **pre-assembled and configured**, or to **build it yourself from scratch**. Before I go into this section further, please note that for any Apple computers, you **MUST** purchase your machine from Apple directly if you want to customize it at all (and customization is somewhat limited). **It is not possible to build your own Mac**, nor will anyone else do it for you. You can buy pre-assembled Macs from various digital and brick-and-mortar retailers, but these retailers will not customize the machine for you.

In the PC world, it's virtually always cheaper to purchase parts from a site like [Newegg](#) (my personal favorite) or [Tigerdirect](#) and assemble them at home; this method also gives you maximum customization and flexibility. If you're an I.T. pro, this option makes a lot of sense, but the reverse is also

true; if you've never built a computer before and don't have any experience in computer repair or hardware maintenance, **don't even think about** doing it yourself.

If you feel like you might have enough experience for the DIY approach, or you know someone who does, keep in mind that there is no universal warranty or service policy for your finished machine. If you have problems, **you** have to troubleshoot them, or find someone who can. You're responsible for dealing with replacing any damaged or defective parts. This all can be a big hassle, and while you might be capable of handling it all yourself, remember to consider the time spent doing so. Saving \$200 from a prebuilt machine is **not worth it** if you are going to spend 20 hours fixing problems over the life of the computer.

Your options, should you decide not to build your DAW from component parts, are quite varied.

\* **Major PC manufacturers**, such as [Dell](#), [HP](#), [Lenovo](#) and [Acer](#), sell computers through a process of "mass customization". Each company offers a handful of template machines with limited customization options (similar to Apple) which the customer can select from, after which the computer is tweaked and sent to the customer. These computers are often reasonably priced with strong service/warranty plans, but tend to have "bloatware" (undesirable pre-installed software).

\* There are perhaps dozens of **smaller custom PC manufacturers**, such as my personal favorite, [AVADirect](#). These companies do not mass-produce their machines and instead build each one from scratch. You can typically get excellent service plans with these PC builders, as well as solid prices and great customization. Bloatware is usually less of an issue here as well. If you go this route, make sure to do your research first on which companies are reputable!

\* Both **digital and brick-and-mortar stores** such as Micro Center or Best Buy often sell pre-assembled machines from major manufacturers. If you keep an eye out for coupons or markdowns, you can score some incredible deals. For example, my local Micro Center often has previous-generation laptops, new in box with full warranties, at extreme discounts. You may also have good luck with reputable eBay Stores that stock premade machines in bulk. This route offers no customization, but potentially amazing prices.

\* As a subset of custom PC manufacturers, a number of **DAW PC specialists** have sprung up over the last five years. These small companies often have high markups, even when compared with other custom PC manufacturers of the same size, but offer added value through software and hardware optimization and specialized customer service. Examples of such companies include [ADK Pro Audio](#), [Rain Recording](#), [PCAudioLabs](#) and [VisionDAW](#). If you want excellent customization, support, and service that is tailored specifically to the needs of musicians, you might consider this option.

## IV. Hardware

The specific technologies used in computer hardware at any given time are in a constant state of flux, and so, for the purposes of this guide, I won't talk about them. Instead, I'll write in more general terms about the importance of various components as they relate to **typical DAW activities** (audio recording, processing, editing).

\* **Processor:** This component is primarily what determines how much your computer can handle at once (plugin processing, audio playback and recording, disk streaming) before overloading your computer's audio buffer. In other words, a better (faster) processor will enable you to simply do *more* at any given time. Note that the **frequency** of your processor (eg. 2.4 ghz) is not necessarily indicative of how fast the processor really is. A five-year old processor can "clock" at 3.5ghz and be capable of running only 1/3 the number of plugins as a modern processor that clocks at 2.4ghz.

It is possible to use multiple processors in a single computer, or a single processor with multiple 'cores' (or a combination of both). For the purposes of computer music production, it is generally good to have as many cores as possible. However, even well-programmed host programs, plugins and operating systems are not perfectly 'multithreaded', which means that doubling your number of cores will **not necessarily** result in a 100% increase in speed. If you are faced with the decision of getting an older processor with more cores or a newer processor that is otherwise faster (ie. higher clock speed), the latter might actually be a better bet. In particular, orchestral sample streaming benefits more from *faster* cores than *multiple* cores, according to benchmark tests. (Of course, if you can get a processor with lots of fast cores, then that's ideal!)

A faster processor will generally result in snappier responses from programs and shorter load times, but the processor is only one piece of the puzzle in this case. Memory (both RAM and hard drives) will impact the general 'speed' and responsiveness of the computer as well.

\* **RAM:** The short-term memory of your computer is crucial for any sort of multitasking. Every application and plugin you load eats up your computer's RAM; if you run out of available RAM, you will experience errors, slowdowns, or possibly crashes. The more RAM you have, the more you can load. This is most important for streaming large sample libraries in plugins like Kontakt or Logic's EXS-24. It is not uncommon to see sample libraries in the 50-100 gigabyte range or higher, and even though direct-from-disk (DFD) streaming relieves some of the RAM burden, it is not hard for such libraries to chew through RAM very quickly.

It would seem obvious that any DAW computer should simply have as much RAM as it can physically support (this is determined from the motherboard) but there are various obstacles that impede this goal. All 32-bit operating systems, such as Windows XP or some versions of Windows Vista, **only**

**support about 3.5 gigabytes of RAM.** Any more you add past that will do nothing, and even within that 3.5gb, any given application will only be able to use 2gb. If you get a 64-bit operating system, you're not out of the woods yet. **You need a full 64-bit "chain"** to take advantage of more than 4gb of RAM for a given application.

Here's a practical example. The PLAY sampler from [East West](#) is capable of 64-bit memory addressing (this is distinguished from a "64-bit audio engine" which has nothing to do with memory), which in theory removes any RAM limitation it might have. However, to make use of that capability, you need a 64-bit OS (such as the classic Windows XP Professional 64-bit) *and* a 64-bit sequencer. If any part of that chain is missing, the plugin either won't load or won't make use of all your memory. Make sure you know not only your computer's physical memory limitations, but **all of your software limitations** as well!

If you're mixing your chain between 32 and 64-bit, the most favorable combination is a 64-bit OS with a 32-bit host and 32-bit plugins. In this case, you will get 4gb of RAM for the host and all plugins within it. If you go with a 64-bit host and 32-bit plugins, you will have to use a **bit bridge** to "wrap" the plugins. This adds processor overhead which will outweigh any benefit of using the 64-bit host (which still has the 4gb limitation since the plugins are still 32-bit!)

\* **Storage (Hard Drives):** Unlike most other parts of the modern computer, hard drives have been very slow to change. The traditional hard drive has moving parts, making it prone to failure and striking fear into the hearts of computer users everywhere. Storage has become incredibly cheap relative to storage requirements of even audio professionals, so there is no reason not to buy at least two internal hard drives and perhaps a backup drive or two. **The more storage space, the better.**

Hard drive speed is something to consider as well, but don't think about it too much; 7200 RPM is the most common (aside from laptops, which sometimes have drives running at 5400 RPM). You want faster speeds, but **it's debatable** as to whether the difference between 7200 RPM and the less common 10,000 and 15,000 RPM drives is worth the greatly increased cost. These faster drives also have lower capacities, meaning they are impractical (or at least, very expensive) for use as audio and sample library storage.

If you want greatly increased drive speed, a better bet might be a **solid state drive**, which resembles RAM more than traditional hard drives. SSDs dispose of moving parts, boasting greater reliability and **significantly improved speeds**. On the other hand, SSDs are typically small, very expensive and may suffer from limited 'write' speeds (ie. how fast data can be put on the drive, as opposed to pulled off). As of this writing, SSDs are still evolving rapidly, so if the promise of **blazing drive speeds** interests you, keep up to date on the latest reviews and specs.

\* **Video Card(s)**: Unless you intend to play games on your DAW computer, almost **any low-budget video card will be sufficient** for any actual DAW-related operations. You might think about getting a fanless video card to reduce noise, or, if you plan on using more than two monitors, a multi-card setup that will support your multiple displays. However, for most people, a card in the \$50-100 range will get the job done perfectly well. The only thing to really **avoid** here is relying on “**integrated graphics**”, which refers to a video card built in to a computer’s motherboard. Integrated graphics can hamper your system’s performance, so it always makes sense to get a discrete video card, even if it’s cheap.

\* **Audio Interface / Sound Card**: Just as with video cards, computers can have integrated audio (also known as ‘onboard sound’), but as a musician you definitely want to avoid this. Integrated audio is perhaps the worst possible solution for desktops and laptops alike, providing poor (or non-existent) recording quality, inefficient drivers, and limited software options. At a bare minimum, it is well-worth it to invest **at least \$100** into a solid, professional audio interface. Such a device is differentiated from a “sound card”, which is typically meant only for consumer usage and lacks features useful or necessary for music creation.

Whether you’re using a desktop or a laptop, your audio interface will fall into one of two general types: **internal** or **external**. Internal interfaces for desktops come in PCI or PCI-E format and must be installed inside the computer directly on the motherboard, while internal laptop interfaces come in PCMCIA format and are usually installed in an easily-accessible side slot. Unfortunately, Apple laptops do not have such a slot, forcing you to get an external solution.

External audio interfaces connect to a desktop or laptop via USB or Firewire (not both) and usually draw power from this connection rather than from the wall. Though the USB/Firewire connection adds a small bit of latency, it is usually not noticeable and can be adjusted through software. The benefits of an external interface include **easier access** to inputs, outputs, and controls, as well as the potential for far **greater numbers of ins and outs**. If you plan on recording more than a couple of channels at the same time, you will almost definitely need some kind of external interface.

With regards to the price of interfaces, my quoted minimum of \$100 really only applies to internal PCI interfaces. For other form factors, you will almost definitely have to pay more; a solid, “prosumer” Firewire interface can easily run \$300, and larger units with lots of ins and outs can hit \$500 and above.

## **V. All About Software**

You probably already have a host program, such as Cubase, Sonar, FL Studio or Logic, that you are already comfortable with, so we won't cover that in depth here. So, what else is there to think about? As a DAW user, not too much, thankfully.

\* **Antivirus / Security Software:** There is some disagreement among audio professionals as to whether it is wise to have a studio computer connected to the internet. Proponents say that having a connection makes it much easier to update your software and download new tools, something that seems like it would be useful at a time where digital product delivery is becoming far more common. Detractors point out that for PC users, an internet connection means that you're vulnerable to viruses, worms, and hacking attempts, requiring the use of antivirus or security suite software that can potentially slow down your system.

If you can't imagine not being connected to the internet, if at the very least just for getting fast updates, then it's absolutely true that **you'll need some form of security** to ensure your computer doesn't get infected (that is, unless you're on a Mac, in which case you have basically nothing to fear). Spyware is sometimes even more annoying than the threat of viruses or worms, as it can seriously reduce system performance. The rankings of the top antivirus and anti-spyware programs change on a regular basis, so be sure to check for reviews both in print and online to see what the leanest, most effective programs are.

\* **File Backup and Recovery:** Owners of new Macs can enjoy the power of "Time Machine" which does an excellent job of backing up their entire file system. PC users get the Windows System Restore functionality, but it's not nearly as powerful: if you're using Windows, you'd be well advised to get a separate, highly-rated backup and recovery suite. **You won't regret it** if you experience a hard drive failure, which you almost definitely will at some point or another. Manual backups are certainly possible (just copy and paste files from one drive to another) but it's nice to have some sort of scheduled and/or automatic system in place.

\* **FTP:** Whether you're constantly connected to the net or not, a good file transfer protocol (FTP) application is a must-have for when you need to transfer large files to a web space. There are plenty of options out there; for PCs, my preferred client is **Filezilla**, while for Macs, **Fetch** or **Transmit** are both great choices.

\* **Copy Protection:** Inevitably, you will run into some form of copy protection scheme in the software you are using. The simplest schemes are "nag screens" for software like REAPER or Goldwave that simply remind you that your software is not actually free, and should be paid for. Next up are serial numbers, delivered in either a product manual, on a CD case, or via email, which must be input when the software is installed in order for it to operate. "Challenge/response" takes protection to the next level by authorizing

software with an **online database**. This also uses a serial system, but is primarily designed to track user registrations online.

Lastly, there is the dreaded “dongle”. A dongle is a USB attachment that comes with a piece of software, usually about the size of a thumb drive (flash drive), that must be present when the software is used. Even when the software is authorized and installed properly, if the dongle is not plugged in, the software **will not work**.

Dongle schemes have created a lot of controversy for several reasons. The dongle itself usually costs money on top of the software, and if it is lost, **cannot be replaced for free**. Dongles take up USB slots, and different companies can require different dongles, meaning you might end up using two or three slots just to run your software. Any software relying on dongles eliminates the possibility of multiple simultaneous installs; for example, even with challenge/response protection, you can use two computers with the software on it at the same time. Not so with dongles – you’ll need to buy another license of the software, as well as another dongle.

Lastly, many people believe that dongles make software less efficient as the software code must constantly make calls to the dongle. Put all of these annoyances together and you have some compelling reasons to not invest heavily in software that relies on dongle schemes. If you’re going to do this, try to at least **pick companies that all use the same protection** (for example, iLok is one protection scheme and Synchronsoft is another.)

\* **Assorted Free Music Software:** [Didn't someone write a guide about this once?](#)