

COMPUTER COMPONENTS

**LEARN HOW IT
WORKS**

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The Magnetic Wonder Of Hard Drive Technology

Most computer users take hard drive technology for granted. That is not a problem, because it is not necessary to know how a hard drive works to use it. People use machines and gadgets everyday without knowing how they work. Hard drive technologies have advanced in so many ways from the original giant drives several feet across. Storage capacity has increased, speed has increased, and the size of the drives has decreased. Home and business computer users benefit from this enhanced hard disk technology in many ways.

The basic technology of hard drives is that they are composed of a series of stacked horizontal platters supported by a main vertical spindle. Each platter is magnetic and is divided into thousands of tiny but separate magnetic areas when it is formatted. A movable arm with a reading and writing magnet on it moves across the face of each spinning platter. The spinning platter combined with the movable arm allows the drive to find any data quickly. This stacked platter hard disk technology has remained since the first hard drives. However, it has greatly increased in speed and efficiency.

Another of the enhanced hard drive technologies is the increased spin speed. The stacked platters are spun by the

central spindle. The spin rate is constant and measured in revolutions per minute or RPM. When it comes to hard disk technology, faster is better! Spinning the hard drive platters faster means that data can be read from and written to the drives faster. On the other hand, the hard drive's movable arm technology that reads and writes the data must be made correspondingly more fast and sensitive to keep up with the increase. Typical hard drive spin rates are up to 10,000 RPM and faster.



The physical size of hard drives has decreased, but the amount of data they can hold is greater. How can that be? New hard

disk technology allows manufacturers to fit even more data on the same size drive. There are many more magnetic areas per square inch on newer drives. Once again, the sensitivity of the movable reading and writing arm had to be increased to take advantage of this hard drive technological breakthrough.

Hard disk technology is very reliable, although it certainly can fail. Failures may be due to defects, wear and tear, electrical surges, or other reasons. Despite all the enhancements in hard drive technology, the drives themselves remain relatively cheap and easy to replace.



The Wise Buyer: Choosing An Upgradable Laptop RAM

Consumers must be extra careful when buying laptop PCs because their parts are usually difficult to upgrade. This is especially true of portable computer RAM. The small computers, Random Access Memory, oversees the transfer of data from the data storage external device to the microprocessor or 'the brain' of the laptop. The main job of the Random Access Memory is to speed up the data transfer. If the current memory of a smaller device can not handle the installed applications, the PC will hang. Even restarting the PC will not be able to solve the problem.

While searching for the right laptop, buyers must first ask themselves what Operating System or OS they require. The Operating System is the 'pump' of the PC. It prepares the PC for running the required application software. Depending on the OS, the standard Random Access Memory requirement will have to be calculated. For example, a standard memory for Windows 2000 is 128 MB; installed applications that will be run will partake on the current access memory resulting in a slower computer processing. The resolution to the problem is to choose a computer with a higher capability than the required memory of the OS.

So now the smaller PC's Random Access Memory will be about 50 % higher than that required by the OS. The next step is to buy a personal computer with an extra slot for an additional memory. An extra slot makes the upgrade needed by your computer possible, since PC applications that are being developed are continuously experiencing an increase in memory usage.

The primary focus of most buyers is the brand of the smaller PC. This can be misleading; the first thing that they must do is to check out if there is a room for upgrade of their PC.

Unlike the standard PC, the diminutive PC is hardwired and is usually made to be disposable in time when faster and better PCs are manufactured. For this reason, upgradable small computers are certainly one of a kind. Despite this, it is a very convenient way to work for most home-based workers or people working in remote branch locations. In comparison, instead of the standard PC in the office, it is less bulky to have the smaller PC with an upgradable laptop RAM.

Memory Sticks: The Portable Digital Storage Media

People may not know it, but their mobile phones have memory sticks, external media storage. Upon installing a mobile application, a prompt will appear asking if you would want the mobile application program installed in the phone RAM or in the recall card or chip.

The remembrance device was primarily marketed by Sony. Its first actual use was for storing and transferring photo image files to and from Sony digital cameras. Later on, however, the retention card evolved into an all-around multimedia recorder that can save and transfer music, video, images and photos and other multi-media files from one portable digital device to another. The evolution of these amazing little devices has enabled the public as a whole to benefit.

The recall device must not be confused with the USB flash drive or other portable storage device. It is primarily used as an added storage capacity to digital video and audio cameras and mobile phones. Unlike the USB flash drive that serves as a detachable storage, the retention card is in symbiosis with a digital device such as a mobile phone or camera to meet its thought and transfer speed requirements.

The recollection accessory is portable. It can be easily transferred from one digital instrument to another. Also, newer engram implements are getting smaller in size and thickness. The latest available size for a recollection utensil is less than 15 mm. That is smaller than the standard piece of chewing gum. Aside from being portable, it is also easy to install in a digital device because of insertion slots.

There have been instances of mobile phone malfunctions because of the effect of the operating voltage of the recall utility, but measures were implemented to eventually lower its operating voltage. In fact, digital device users embrace the use of recall accessory up to the point that laptop PCs are now being manufactured with recollection device slots and adaptors for data transfer.

As more and more digital devices are being conceptualized, memory sticks are expected to further evolve up to the point when it will finally be the main medium of data storage and transfer.

The Purpose of a Motherboard Chipset

In order to understand the purpose and function of a motherboard chipset, it is first necessary to have a working definition of these devices on the main board. Here are some basic facts about the chip set that will help to explain the nature and function of the component.

Essentially a set of these chips are not a single component, but rather a series of components that have been integrated to work together as a single unit. This set of interrelated chips will be used to process a common function or action. For example, one set of chips may be devoted to linking the CPU to such parts as the main memory for the hard drive, or ensuring the proper function of the graphics controllers. In other situations, the chips may be configured to process such important functions as the audio, the connection to the Internet, and the display on the screen of functions associated with software such as a word processing database. Each of these functions is vital to the personal computers ability to work as designed.

The mainboard components will be physically located on the primary board itself, even though it will start out life as a separate component. Often the same manufacturer will not even produce the two pieces. The two will be attached during the process of assembling the various components into a fully

functioning hard drive. There is no difference between the chip sets that are used in desktops, laptops and notebooks. Major routine enhancements of these devices enables each of the units to process more data at a faster rate with each new release. While there are a number of companies who focus a great deal of their production on these sets, there are also companies that manufacture servers that produce their own original line of chips for the mainboards as well.

These mainboard components have come a long way over the last twenty years and will no doubt continue to be refined. For more information about the function of motherboard chipsets within your own particular make and model computer system, check your owner's manual or consult the manufacturer web site.



What Does a Motherboard Do?

While quite a few people know how to use a computer, we have no clue how each of the components in our hard drive functions. For instance, how many of us have any idea as to what a mainboard contributes to the overall functionality of our desktop and laptop computers? Here are a few basics that will help you understand what this piece of equipment does and why it is essential to the efficiency of your computer.

Also known as a system board or logic board, the mainboard has been around for quite some time. Before the days of the development of what was to become desktop technology, mainframe computers operated with a series of components connected by a backplane, which in turn were interconnected with wires. Individual cards carried the memory and other functions and would be inserted into the slots of the backplane. The older systems that had this style of operating system were extremely slow and took hours to do one job.

Instead of having to rely on this series of cards or boards that could be inserted into the backplane, the newer technology that allowed current and function to be transferred with glue logic made it possible to prepare what amounted to one master control board. This new single control board accomplished the same task of the older technology, in that it allowed all the

components contained within the hard drive to receive the power and perform the logical functions they were designed to accomplish. Thus the new technology enhanced the ability of the newer models of computers to perform their task at lightening speed.

Today's system boards usually have such components on the board as the main memory storage and the microprocessor. Video and audio functions are also housed on this master control board, which makes it possible for us to enjoy audio and video streaming, as well as display instant messages. Without the astonishing development of the logic boards computers would still be in the dark ages. This one simple innovation carried us into our new era, where home computers were not only possible, but also practical. As we continue to advance in computer technology, we may find that this essential motherboard will accommodate even more functions.

Finding a Replacement Notebook Motherboard

If you find that your notebook motherboard (also known as a systems board or logic board) needs to be replaced, there are

several options at your disposal. Here are ideas on where to find another system board for your computer.

One of your best bets is to check with the manufacturer of the equipment you own. Most manufacturers have agreements in place with vendors who perform maintenance and repair on any units that are still under warranty. In the event that the logic board on your personal small computer has developed a problem while still under warranty coverage, your best bet is to turn the device in for repair. In many cases, this will cost you nothing but the time you have to do without the equipment.

Even if the warranty has expired, there is a good chance that the local dealer will have access to a replacement systems board that is right for your make and model. Go ahead and make the call. You may be able to have your computer up and running a lot more quickly than you think.

Of course, there is a good chance you can find the logic board for your computer online as well. To find sites that carry parts for your device include the model number in your search specifications. Some of the sites will be for repair shops while others will simply supply parts. If you know someone locally that could install the new systems board, then go ahead and order the part. Typically, the new component can be shipped to your address within a day or so. From there, it is just a matter

of getting your computer and the systems board to someone with the expertise to handle the installation.

Locating a new or refurbished logic board is not that hard to do. Start out by checking the manufacturer of your computer and then expand the search as circumstances dictate. Within a very short time, you should have a new or refurbished notebook motherboard installed and be back in business.



Powerful PCI Video Cards Enhance Computer Graphics Speed

PCI video cards are the current standard in graphic display technology. The video card is the translator that takes what the CPU tells it to display and draws the images on the screen. PCI graphics cards are more than simple translators, however. Most PCI cards sold are also graphics accelerators. That means they can calculate the graphics images themselves, relieving this burden from the CPU. It is like having a tiny PCI graphics computer inside your main computer.

PCI is the acronym for Peripheral Component Interconnect. PCI is a standard for how peripherals connect to a computer's motherboard and how they communicate. All PCI graphics video cards follow this standard, and have the same type of connector. There is a corresponding expansion slot inside the computer designed to accept PCI graphics cards or other PCI devices. The PCI video standard controls the electrical characteristics of the expansion slot, how fast data are transmitted to the computer, when the video card is allowed to send data, and other crucial items.

PCI video graphics cards are the latest in a long line of video standards. Early IBM computers used the Industry Standard Architecture or ISA video connections. The MCA and EISA

standards followed, which were replaced by the VESA Local Bus (VLB) and AGP standards. Finally the PCI technology was introduced, and it quickly replaced the other standards for video cards and peripherals. The PCI Express or PCIe standard is relatively new, and promises even more speed and power for PCI graphics cards.

The introduction of Plug-n-Play computers helped the industry standardize on PCI cards. Plug-n-Play enables computers to detect new hardware in the computer and install the correct software to run it. The PCI standard is able to detect more video cards and PCI peripherals than other standards. Users rarely have to bother with setting interrupt requests (IRQ) and jumper switches.

The PCI video standard is an efficient and speedy way of connecting peripherals such as video cards to computers. As manufacturers create ever more powerful video cards, the power of PCI video cards will continue to increase.

How Processor Speed Powers The Personal Computer

Processor speed refers to the rate at which the central processing unit or CPU of a personal computer can get things done. The CPU speed is also called the clock speed, because it is regulated by an oscillating crystal with clock-like precision. Processor speeds are measured in Hertz (Hz). One Hertz means one cycle (or task) per second. One MegaHertz (MHz) means one million cycles or tasks per second.

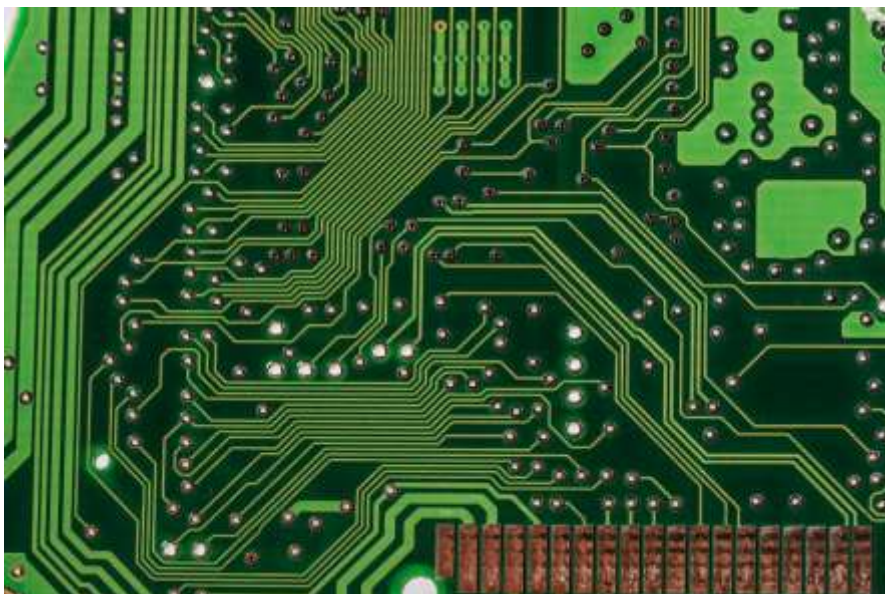
Today's processor speeds are in the GigaHertz (GHz) or billion cycles per second range and climbing. Generally the speedy processor can perform only one task per cycle. However, because processors can perform billions of tasks per second, a lot of work gets done. Moore's Law predicted that processor speeds would continue to double about every 18 months. This prediction about processing speed increases has generally held true.

The speed of a processor in MHz or GHz is used as a general speed comparison to other computers. This is acceptable as a very rough comparison only, unless two identical computers are being discussed. For example, when comparing processor speeds, a computer with an 800 MHz CPU is expected to be twice as fast as that same computer with a 400 MHz processor in it.

If two computers are being compared, and each has different components but the same processing speed, the components

can influence the overall speed of the PC. For example, a fast video card on one unit might give it an overall performance boost. A slow hard drive on the second PC might hinder its performance. Therefore a computer with a processing speed of 4 GHz from Manufacturer A might be slower or faster than a 4 GHz computer from Manufacturer B.

The speed of the processor is only part of the overall measure of the performance of a computer. The best way to compare the performances of different computers is to run a standard benchmark test. A benchmark test runs the exact same tasks and programs on each computer, and is an accurate measure of the processor's speed, video card, hard drive, bus speed, and many other variables. The computer which completes the benchmark test in the shortest time is the fastest unit, regardless of the processor speed.



How Much Difference Does The Processor Type Make

The processor type does not make much difference for the home or casual personal computer (PC) user. The buyer simply purchases a PC, which likely has one of the most current types of processors in it. These types of off the shelf computers have processors which will run all programs required by the user. More serious customers may build their personal computers from scratch. These hobbyists will choose carefully from among the various central processor (CPU) types. Several CPU brands are available.

Many consumers are familiar with the types of processors manufactured by the Intel Corporation. Intel processor types were originally given names such as 286, 386, and 486. The next generation of their types of processors was given the name Pentium. The Pentium processor type has grown through the Pentium 2, 3, and 4. Now even dual processor types are available from Intel. All these types of processors are so well known because they are associated with personal computers which run the popular Windows operating system software from Microsoft. 64-bit processor types have been introduced.

Advanced Micro Devices or AMD makes another type of processor. AMD processor types are similar to the Intel

processors because they run Windows and are a direct competitor. These processor types function somewhat differently than the Intel processors while performing the same jobs. Direct speed comparisons of these different types of processors are difficult because each processor requires a different motherboard. Nevertheless, the AMD type of processor has produced the K5, K6, K7 and Athlon brands. It was also the first manufacturer to offer the 64-bit type of processor.

Motorola manufactures a type of processor very different from the others already discussed. The PowerPC chips were used in the Apple Macintosh line of computers. Computers with this type of processor are marketed as more user-friendly than their Windows counterparts. Mac computers with this processor type are advertised as hip and cool, while those with Intel chips as older and stuffy.

Unless you have a need for a specific type of processor chip, simply research and buy the personal computer that will perform the tasks you need. The processor type in the PC really doesn't matter as long as it gets the job done for you.

Ram Technology Simplified

What is RAM, anyway? Information about computer hardware and software is largely technical in nature. However, you do not have to be an engineer to learn about it. Rather, you can understand it in a relatively non-technical way. That is, you can learn a thing or two about RAM technology and how it will affect the way you work with your computer.

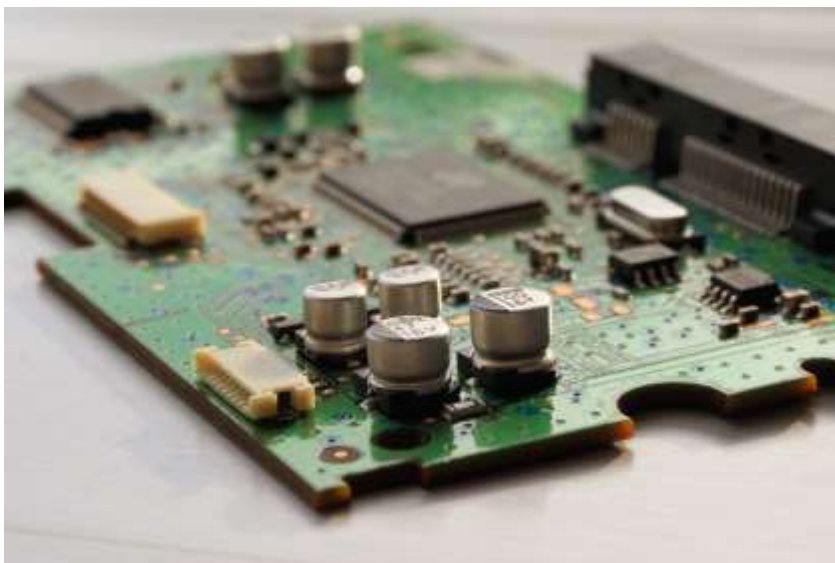
It is fun to surf, write a word document, or edit photos. But sometimes, the fun ends when our computer is taking too much time to read our commands. There are certain reasons why a computer's performance can slow down. It may be that the computer has been infected with a virus, which was contracted while surfing the net; or that the micro processor is an older version, or that the RAM or Random Access Memory needs an upgrade.

Most of the time, the decrease in the speed of a computer is the result of RAM getting eaten up by other applications. If you want a faster computer, add up the storage space of your RAM. For Windows XP to perform considerably well, your computer needs to have at least 512 MB of RAM.

On the technical side of RAM technology, RAM is actually a data storage device. The difference between RAM and other data storage devices, such as a hard disks and flash drives, is that

RAM cannot store or save data in the same way. It reads and writes everything that we do with our computer. But the moment the computer has been shut down, everything that we do is lost. On the other side, RAM is superior to other data storage devices in that its retrieval times are consistent and short. It can retrieve currently saved data immediately after clicking a mouse. Because of this feature of RAM (its speed and consistency, it has been assigned to be the main or primary storage.

RAM technology has evolved over the years. Several types of RAM have been introduced to the market to cater the needs of computer users for increase in speed and consistency. So if you are contemplating adding up the storage capacity of your RAM, check first the type of your current RAM and your computer's maximum RAM capacity.



Purchasing a Refurbished Motherboard

A refurbished motherboard may be the least expensive route to go if you should have to replace the system board. When it comes to replacing the logic card in your computer, you may choose to go with one that has been reworked without sacrificing quality. Here are suggestions of where you can purchase a reworked logic board that will be reliable and provide you with many continued years of service.

A good place to start in your search for a reworked system board is with the manufacturer of your hard drive. This can be especially important if you are replacing the board in your laptop, as the system boards with a notebook computer tend to carry more functions than the types that are found in desktop models. By going back to the company that originally put together your hard drive, you are assured of getting a replacement board that will be a duplicate of the one you are replacing, or at the very least one that is compatible with the rest of your system. There is also a better chance of getting some sort of short-term warranty on the reworked main board as well.

There is also the possibility that you could find a perfectly acceptable rebuilt main board at a local computer repair shop. Many times shops that are used to working with a number of

different computer types will keep a varied inventory of essential components. The type of logic board you require may be already in stock, which would speed up the process of changing out the boards and getting you back in the swing of things.

As a third option, you can take to the Internet. Replacement main boards may be found at all sorts of sites that sell discounted components, including reworked units. Often, these are available at very reasonable prices. Keep in mind there may be no guarantee at all associated with these discount components, so order at your own risk. While online, you may want to check auction sites as well. A used board that has been rebuilt could be yours at a reasonable rate, plus you have the chance to check the feedback rating of the seller before you ever place a bid. As in all cases, when purchasing a refurbished motherboard, due diligence by you must be undertaken.

TV Video Cards Are Cool

Are TV video cards too much of a temptation? These video cards allow you to view television signals on your computer monitor. Now you can surf the web and channel surf at the same

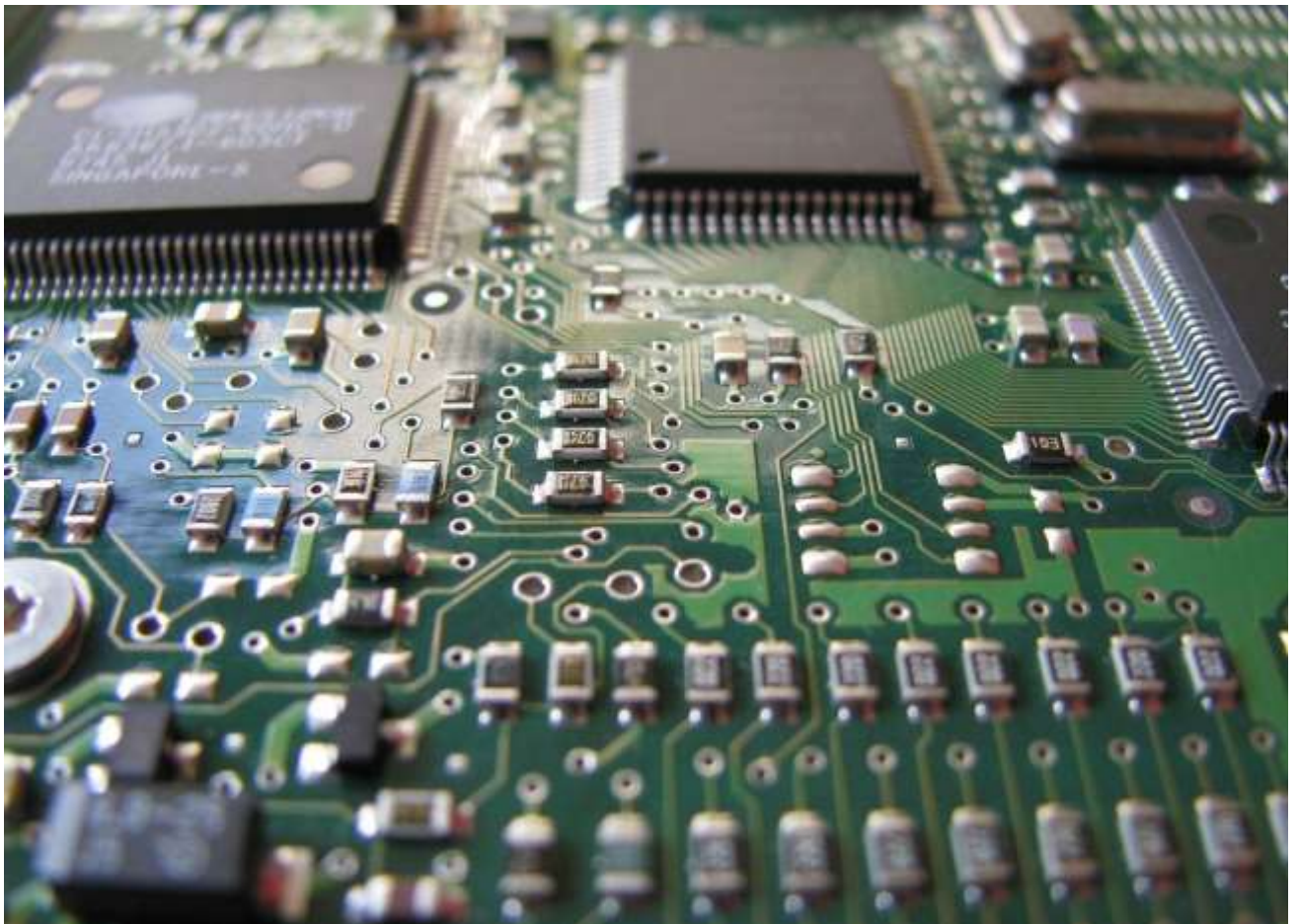
time. Is that productive, or is it a time waster? A TV graphics card can be both, depending on the user. If TV add-in video cards are used correctly, they can increase productivity. There are several useful features of TV compatible video cards.

These TV graphics cards can grab more than just a television signal. They can access cable signals, satellite TV signals, VCR and DVD outputs, camera signals, and just about any graphics signal that is compatible with the TV video card's connectors. Therefore video surveillance is one good use of TV graphics cards. Inexpensive web cameras let you see at a glance of the screen who is at any door of your business or home. You can keep track of kids and pets. If you have a video recorder running, you can save these surveillance videos taken from the TV video card setup.

Many people use their computer and TV video graphics card as a personal digital video recorder. There are commercial recorder units that are dedicated to recording, pausing, and replaying live TV signals. With a TV graphics card, you can make your own inexpensive version. Record your favorite shows to your hard drive. Then you can replay them on your computer screen, or output them to your television via the TV video card. You'll never miss your favorite shows again.

There is much, much more that a TV graphics card can do. If you experiment, you'll find new and creative uses for it. Be sure

to visit the support forum of the manufacturer of your card. You'll get excellent tips and support for your TV card. Keep the drivers and software of your TV tuner video card up to date, so that you get the best results. TV video cards can be both productive and a distracting, depending on how you use them.



How Video Card Software Can Help Your Computer

You have just purchased the hot new video card you wanted, and you toss the video card software CD into the trash. That is a big mistake. You will need that video card's software package to get the most performance out of your graphics card. The video card is a special kind of graphics processor. It calculates the graphics parts of programs, leaving the CPU to perform other important work. Video cards have become so powerful and sophisticated that they really need their own supporting software to function properly.

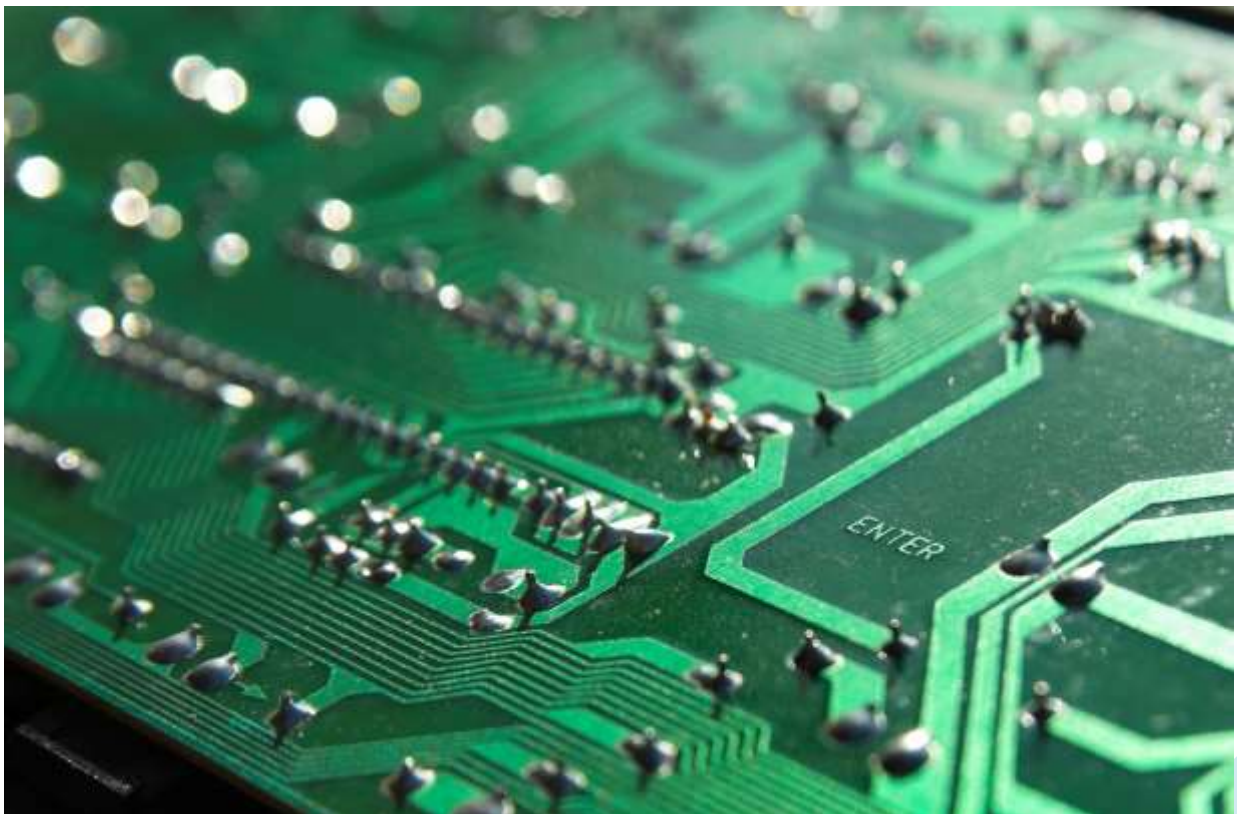
The first task of a video card's software is to assist with the installation of the new graphics card. There might even be an installation poster in the box too. When you insert the video card CD software into your computer, the installation program will run. This graphics card software will show you how to disable and remove your old video card. It will install any necessary software required by your new video card. The video card's software will also examine your computer and change any necessary settings. You may need to reboot one or more times during this process.

The next task of the graphics card software is to allow you to adjust both the number of colors and screen resolution quickly and easily. A small video card manager icon will often be placed into the system tray for easy access. The graphics accelerator card's software will set the default number of display colors and resolution for your computer. However, there may be cases

where you want higher resolution or more colors, such as image editing. Be aware that increasing colors or resolution may slow down the screen display, depending on your video card.

Another purpose for the video card's software is to test and diagnose the video card. The video software may prompt you to run a graphics test on your old video card, before the new one is installed. Then it will run the same test on your new card. Comparing the values given by the graphics card software will show you how much faster your new card is.

There is often video card diagnostic software included to help you troubleshoot display and video driver problems. Don't throw that video card software in the trash, because you will need it.



Video Cards Let Computers Talk To Monitors

Video cards are the eyes of computers, much like processors are the brains. A video card takes the graphic instructions calculated by the processors and displays those instructions on the monitor. Early computers used television screens as monitors, and had no need for video cards. However, those basic computers were limited to the colors and resolution of the television screen. Today's high powered video graphics cards offer amazing screen resolutions and depths of color not available on television sets.

Modern computers need video display cards because they, and their monitors, are digital devices. The video monitor may look like a small television, but it accepts only digital input in small but discrete packets. Televisions are analog devices, meaning that they accept only analog or continuous signals. The modern video card translates the program's instructions of what to draw on the screen, and causes the monitor to display the proper images.

The technology of the video card has improved dramatically since the days of the plain green screen monitors. Not only do graphics cards display the computer graphics, they can now also calculate the graphics themselves. Modern computer games have 3D effects, lighting, shading, transparency, and a

host of other features made possible by high end 3D video graphics cards.

The video card can even talk to the rest of the computer much faster. The communication link between the two is called the bus, and that technology has advanced from ISA to VESA, PCI, and now PCI Express or PCIe. External graphics cards with their own cooling and power supplies are now available.

Most home computer users don't need expensive, powerful 3D graphics card accelerators unless they play lots of games. Those who perform desktop publishing with large images, or edit video, may also need the additional horsepower these powerful video graphics expansion cards can offer. For word processing, e-mail and web browsing, however, the standard video cards in today's computers are more than powerful enough.