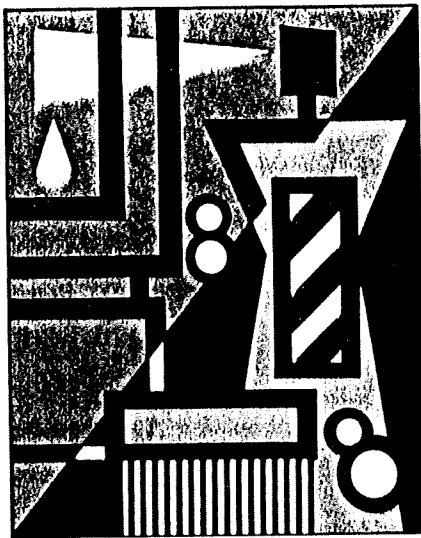


BY VINCENT D. O'CONNOR

*Five types
of problems
and how to
prevent them*

TAKING CARE *of* YOUR APPLE



A wise old flier of kites once noted that an ounce of prevention was worth a pound of cure. Although it's highly unlikely Benjamin Franklin had your Apple II in mind at the time, it applies equally well to your computers and peripherals.

Computer users often overlook or ignore conditions that lead to malfunctions and failures. Simple and inexpensive maintenance can reduce or eliminate those conditions, however, and extend the life of your computer as well as improve its overall performance and reduce repair costs. This article takes a detailed look at five types of problems and what steps you can take to avoid them.

Dirt and Contamination

Your Apple is exposed to a wide variety of dirt and other contaminants daily: dust, soot, tobacco smoke, bits of food, fiber particles, pieces of printer paper, oxide from disks, and loose printer-ribbon threads. Contaminants such as these find their way onto and into your computer.

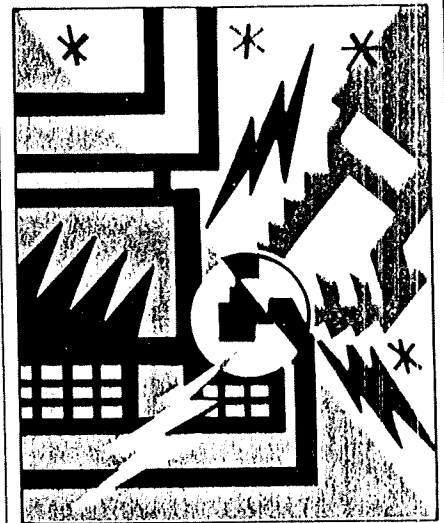
Dirt on external surfaces is annoying. Dirty screens are difficult to read; dirty housings are unsightly; dirty keys feel uncomfortable. Contaminants on internal surfaces are much more serious, though.

Contaminants blocking cooling vents and fan filters can cause heat buildup, which leads to component failure. Contaminants such as graphite particles from pencils, magnetic oxides, and soot, can create short circuits that cause erratic operation and component failure. Contaminated cables, connectors, and switches can fail to make good

contact. As a result, data can be garbled, especially when you're using a modem to transmit or receive it. Contaminated drives can cause data misreads that show themselves as I/O errors, damaged disk surfaces, and random errors.

The best cure for dirt and contamination is preventive maintenance. Don't smoke or allow smoking near your computer. Don't eat or drink while using your computer. And keep your hands clean. Dirt on your hands almost always ends up on your computer.

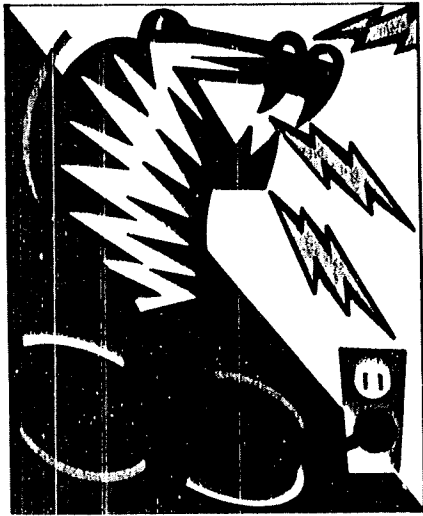
If you have a wood stove or kerosene heater, keep the computer away from it. Even modern wood stoves release smoke, ash, and soot. Kerosene heaters are worse, depositing a mist that condenses on disks, drive heads, screens, and circuit boards. The mist is greasy, conducts electricity, and is difficult to remove. In time, it eats into the plastic casing of your computer.



Clean Up Your Act

Clean your system on a regular basis. How often depends on how dirty the environment is, but once a month should be sufficient in most cases. You can buy commercial cleaning kits, but many common home items work just as well.

Wipe outer surfaces with a household cleaner such as Fantastik or Formula 409. Don't use petroleum-based cleaners, since they can damage painted surfaces. You can clean most monitor screens with any household glass cleaner and a paper towel or lint-free cloth. Beware, however, of antiglare screens and monitors with antiglare coatings, such as the old Ap-



ple monitor III. Glass cleaners tend to remove the coatings on these screens, destroying the antiglare properties and making the display difficult to read. Clean them only with a lint-free cloth or a cleaner approved by the manufacturer.

Never spray the cleaner directly onto the computer or monitor screen. Apply the cleaner to a paper towel or lint-free cloth so that it's damp but not soaking wet; then wipe. This method prevents excess cleaner from getting into disk drives or cooling vents.

Clean between the keys with one of the commercially available cleaning swabs or a cotton swab moistened with isopropyl alcohol. A can of compressed air with a narrow nozzle will blow away most contaminants underneath the key caps. You can find compressed air at most photo supply stores or purchase it from a company that makes or distributes computer cleaning supplies.

If your keyboard is really *grimy*, you may want to pry the key caps off with a bent paper clip and soak them in water with a mild detergent. If you must operate your system in less-than-ideal surroundings, investigate the SafeSkin from Merritt, a see-through protective plastic cover for your keyboard.

Cleanse disk-drive heads periodically with a low-abrasive cleaning diskette and cleaner. For \$19.95, ThirdWare Technology's VeriClean software automates the process by manipulating the read-write heads for optimal cleaning. Alternatively, you can open the drives and clean the heads carefully with a cotton swab and either isopropyl or dena-

tured alcohol. You do need to take care when opening the drives, though, and doing so usually voids any warranty.

Don't forget to clean your printer. Use a small vacuum cleaner to remove accumulated dust and paper particles. Use isopropyl or denatured alcohol and a paper towel or lint-free cloth to clean the print rails (the metal bars that the print head "rides" on). Once you've cleaned it, apply a few drops of silicone spray or a lightweight oil such as 3-in-1 or sewing-machine oil on a paper towel or lint-free cloth, and lubricate the rails. Clean the platen (the black roller over which the paper feeds) with denatured alcohol to remove any ink and gloss that builds up over time. Remove the print head (see your printer manual for instructions) and soak it with the pins down in isopropyl alcohol for about half an hour.



Static Charges

If you've ever walked across a carpet and gotten a shock when you touched a door handle, you've felt the power of static electricity. A person can feel a static charge only when it reaches about 2,500 volts; far less can damage or destroy electronic parts, however. Studies at the 3M Corporation have shown that the buildup of static electricity of a person walking across a carpeted floor is about 12,000 volts; under the same conditions, the average accumulation when you walk across a vinyl-tile floor is 4,000 volts.

Static can not only damage electronic components, but it can also alter or delete the contents of RAM

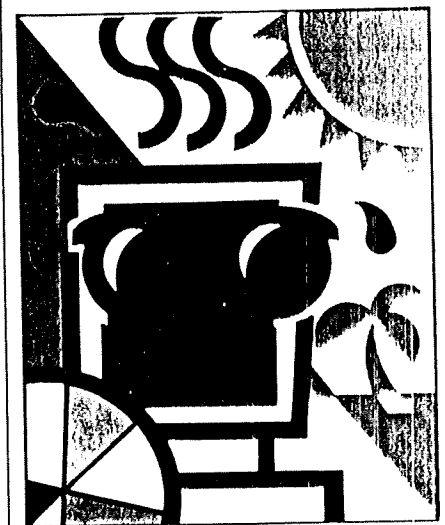
and disks, blank the monitor's display, cause unwanted printer carriage returns, and more. Cables connecting peripherals such as printers, disk drives, and modems are especially vulnerable: A person walking over a cable can cause static to discharge into it.

Static can't be eliminated, but you can reduce it. Ideally, you should keep the humidity at about 50% and remove carpets and rugs from the work area. Make sure all equipment is properly grounded. Don't defeat three-pronged cords by using a two-prong adapter without connecting the grounding wire or by cutting or bending the third prong on the cord.

Place antistatic mats under chairs and anywhere people walk by and can touch the computer. The best mats have a grounding wire that conducts static away from the area, but they work only if they're properly grounded. You should route connecting cables under antistatic mats or place them where you can't touch or step on them. You can also use antistatic sprays or wipes, but they are effective only for a short time. You must reapply them at regular intervals.

Problems

Power problems come primarily in three categories: power surges, power drops and failures, and line noise. Most are caused by lightning strikes on lines and transformers; damage to underground cables; power switching; and appliances such as washers, refrigerators, and the like. Line noise can garble data, whereas power surges can damage or even destroy components.



Surge and noise protectors can prevent problems due to power surges and line noise and come in various sizes and capacities. Some plug into the wall, and others are built into power strips and come with their own circuit breakers. More powerful (and more expensive) are line conditioners, secondary power supplies that watch for overvoltage and undervoltage.

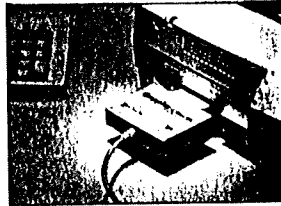
When you're deciding what type of surge/noise protector to buy, there are four values you should be concerned with: response time, noise rejection, peak current, and maximum transient voltage. Response time is how quickly the protector reacts after sensing a power surge. It is usually rated in nanoseconds or picoseconds, with picoseconds being the faster response time. Noise rejection is measured in decibels (db) and frequency range. The higher the decibel number, the more the noise that's eliminated. Thus a noise reduction of 60db is better than a noise reduction of 20db. The frequency range indicates the frequencies of noise the filter rejects; the wider the range, the better the filtering. Finally, the peak current and maximum-transient-voltage ratings indicate the maximum suppressible current. The ratings are in amps; the higher the number, the better the protector.

If you need to protect against power drops and loss, you need a standby or an uninterruptible power supply (UPS). A standby power supply automatically kicks in in the event of a power loss or severe low-voltage condition. An uninterruptible power supply differs in that it always powers the computer, charging its own internal batteries while there is incoming power, and continuing to supply battery power to the computer (and sometimes peripherals) when line power fails. Both standby and uninterruptible power supplies usually contain surge and noise protectors as well.

A UPS is generally more expensive than a standby power supply because it's designed to provide power constantly. The advantage is that the power is always regulated, providing protection against low-voltage conditions that aren't severe. It also has no switching transients that can damage sensitive

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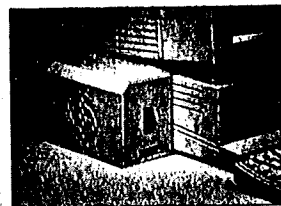


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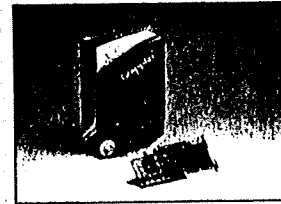
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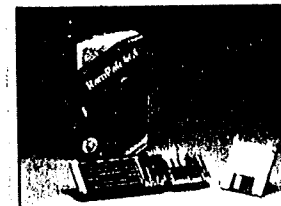


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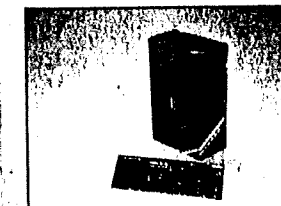


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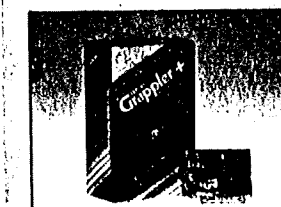


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equipment or add-on cards. Typically, neither type of external power supply provides electricity for more than five to ten minutes, just long enough to allow you to save your work in progress, exit from the application, and shut down your system.

Both standby and uninterruptible power supplies begin at 200 watts and can go to megawatts. Before you buy, make sure you know how much power your total system consumes and allow for items such as new printers, add-on boards, and other peripherals you may purchase in the future.

Magnetic Fields

Every electrical or electronic device generates some kind of electromagnetic field. Items such as motors, bells, buzzers, stereo speakers, and transformers contain either permanent magnets or electromagnets. Many common metal objects—paper clips, scissors, screwdrivers and other tools, even staples—may be magnetized. Your Apple generates magnetic fields as well, from the disk-drive motors and transformers in the monitor.

Damage from magnetic fields can be hard to pinpoint. It can manifest itself as garbled or lost data from disks, altered monitor displays, and transmission errors in networks. You should keep your computer three to six feet from potential sources of stray magnetism including phones with mechanical bells, photocopiers, standby and uninterruptible power supplies, and audio speakers. For example, locating Bose RoomMate speakers close to a monitor can cause the colors on the screen to warp or wash out. Another problem common primarily to Apple IIc owners is disk-drive errors that result from placing the computer directly under the monitor.

Store floppy disks in a closed box or case away from your computer. Don't place disks on top of the monitor or disk drives, and don't store them any closer than three feet from the computer or other potential sources of stray magnetism.

Heat Buildup

If you read the manual for any of the components that make up your computer system, you'll notice that each item has a specified operating and nonoper-

Flight notes



2B

✦ **Wrapping Up Europe** - The deadline for entering our "Find Red Square" contest was November 15th, 1988. Current plans call for a mid-December drawing to determine the contest winner. This contest, requiring you to use *Flight Simulator* or *Jet* to locate Red Square on our new "Western European Tour" *Scenery Disk*, was as much fun for us as it was for you! Watch for another *Scenery Disk* promo contest next year.

✦ **The ThunderChopper/SubLOGIC Connection** - ActionSoft Corporation was originally set up as a separate marketing arm for SubLOGIC-engineered, quickly-produced, low-cost simulations specifically designed for mass market channels. We soon discovered that SubLOGIC engineering is incapable of cutting corners when it comes to developing new products. Instead, they spent many months turning ThunderChopper into a very different and desirable type of helicopter simulation. In a departure from most wargame-type scenarios, ThunderChopper assigns you first to aerodynamic flight training, and then to rescue missions. Even combat missions are defensively oriented in that your primary assignment is to escort your combat units. You only get to "shoot-em-up" when defending your troops from enemy attack. Colonel Jack Rosenow, President of ActionSoft, was the helicopter flight instructor at the University of Illinois. He provided us with the insight (as well as the ultimatum) to make ThunderChopper's vertical flight characteristics the most accurate of any helicopter simulator on the market. This makes it unusually nice to fly.

✦ **Its Back!** Not advertised since early 1984, the classic *Night Mission Pinball* will be back in production once again by the time you read this. Priced at only \$29.95, now everyone can afford to add this classic to their software collection. If you're a family person like myself, be prepared to be without your computer for extended periods of time. Pinball's uncanny realism and general appeal has a way of captivating everyone.

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ating temperature range. Staying within the specified range is important. If the temperature drops too low, mechanical operations such as printing and disk access can become sluggish. If the temperature goes too high, the life of the electronic components can be shortened, causing more-frequent failures and intermittent errors.

Correct placement of your computer is the key to keeping it cool. Never install it where it will be exposed to direct sunlight for extended periods of time. Overheating can occur rapidly when direct sunlight falls on the computer. You should also keep it at least six feet from heating vents and radiators, including space heaters. Never allow heating vents to blow directly on any part of the computer.

Make sure all cooling vents on the computer and peripherals are clear and free of dirt and other contamination. Don't place your computer against a wall, and don't stack components. Too many people stack their disk drives on top of the computer and then the monitor

on top of the disk drives. This practice concentrates the rising heat in the uppermost component and blocks a significant portion of the cooling vents.

For all Apples except the IIc, it's wise to add a cooling fan to circulate air, especially if your slots are full of add-on cards. Internal cards add their own heat and increase the heat the power supply generates, because of the greater drain they place on it. Laser 128 and Apple IIc owners should always prop their systems up, using the handles on the back of the computer to promote convection cooling.

The rewards for keeping your computer in top condition may not be readily identifiable, but spending the time and effort will improve the chances that you and your computer will have a long and happy relationship. ✦

Vince O'Connor is a free-lance writer, programmer, and co-owner of MAH Software Services, which provides training, consulting, and custom programming for small businesses.

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