Excerpt from

# Introduction to PC Repair

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The following is a sample excerpt from a study unit converted into the Adobe Acrobat format. A sample online exam is available for this excerpt.

Personal computers (PCs) have become extremely popular in the industrialized world. In all types of businesses and for people at all levels of education, the PC provides access to vast amounts of information and computing power. In fact, today's commonplace desktop PC now boasts more computing power than the massive, room-filling mainframes of the 1960s, once affordable only to the largest universities and corporations.

Today, schools and businesses aren't the only places where you'll find powerful computers. The PC has also become a permanent fixture in many homes. Some homes even have more than one. In such cases, everyone in the family probably knows how to use the computer. Especially when connected to the Internet, the PC can offer every member of the family a variety of services, such as tracking finances, storing recipes and other records, corresponding with friends and relatives, or just exploring a topic of interest. From *aardvarks* to the *zodiac*, it can all be accessed through a PC.

This program will teach you about the components, operation, maintenance, and repair of PCs. Whether you're looking to maintain just your own computer or are seeking employment in the field, this program will provide you with a thorough knowledge of personal computers and related components. Also, if you're so inclined, the program will give you the knowledge you'll need to help you obtain your A+ Certification, which requires successful completion of an A+ examination.

In this excerpt, we'll discuss setting up a PC repair workshop. After reading through the following material, feel free to take the sample exam based on this excerpt.

## ONLINE EXAMINATION
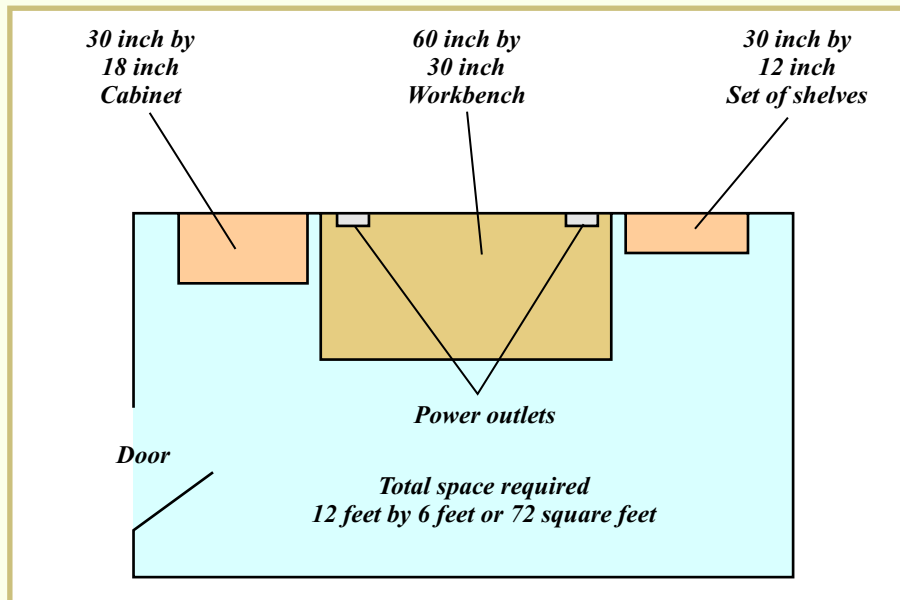
# SETTING UP SHOP

## The Workplace

Your PC repair workplace may be any one of a number of locations. If you're a hobbyist or intend to start a small business, your workplace will likely be a room or specific area set aside in your home. If you're employed as a PC repair technician, you'll probably be provided with a workbench or other area depending on your assigned responsibilities. In the following workplace description, we'll focus primarily on creating a home workshop for PC repair. However, a large part of the information presented here also applies to PC workplaces in general, including a technician's work area.

### Location

There are several considerations in selecting a location for your shop. First, the area should be clean, dry, and well lit. It should be located so that PCs and components can be easily transported in and out of the area. It shouldn't be located where equipment entering or leaving the shop must be carried up and down stairs or through narrow doorways and aisles.

At a minimum, the work area should contain enough space for your workbench; shelving for your books, catalogs, and reference materials; a cabinet for spare parts; and space for tools and test equipment. Figure 1 shows a simple layout. Your basic need for space will increase depending upon the number of PCs you expect to be repairing at any one time and on the quantity of spare parts you need to keep in stock. In any case, remember to include enough elbowroom to work and move equipment in and out easily.

**FIGURE 1—This simple shop layout provides ample storage and workspace.**

30 inch by
18 inch
Cabinet

60 inch by
30 inch
Workbench

30 inch by
12 inch
Set of shelves

Power outlets

Door

Total space required
12 feet by 6 feet or 72 square feet

When determining your shop location, you must also consider electrical power. Enough power outlets should be available and conveniently located in relation to your workbench. The power at the power outlets should be clean; in other words, appliances such as refrigerators, freezers, air conditioners, or furnace motors shouldn't be on the same circuit you're using for repair work. Make sure to install a *power conditioner* to smooth out any power spikes from nearby appliances. Power conditioners will be discussed in greater detail later in your study material on power supplies.

## Organization

How you lay out your work area will play a large part in determining your working efficiency and susceptibility to accidents. First, arrange your tools within reach on a peg-board, tool holder, or tool caddy (Figure 2). You should always return tools to their proper storage location when not in use so that you can find them when needed.

Always keep your workbench neat. It's annoying to bring in a piece of equipment only to discover you have no place on the workbench to set it. It's equally annoying to try to reassemble something when extra parts, such as loose screws and washers, are mixed in with the parts



*FIGURE 2—A Tool Caddy*

you need. The best way to prevent a cluttered workbench is to avoid the temptation to set things on the bench, even for a minute, if you don't intend to leave them there.

One last note about organization involves gravity. Store your smaller and lighter objects either up high or down low. Always store the heavier objects on shelves or surfaces that are about waist high—your back will thank you when it comes time to move them. Be especially careful never to set heavy objects high up on a set of free-standing shelves, such as a bookcase. Even though things may seem stable at the time, if you later move items out of the lower part of the shelving unit, the weight of the objects stored up high may then cause the whole structure to tip over.

## Security

Security is important for any PC repair facility, whether it's in the home or in a room set aside within a large company. PCs are prevalent enough today that they and their components are useful and easily peddled commodities.

If located in the home, your PC workshop should be secured whenever it's not in use. Not only do you have to secure your tools, parts, supplies, and test equipment, but you may also have other people's property on hand. The same may also go

for a company workspace that may contain PCs and components such as networking cards. Many well-meaning people think nothing of "borrowing" cards or components to repair or upgrade their PCs at work. Then, when you need a part, it's gone.

To maintain control and security of your equipment and supplies, as well as the property of your customers, you should always keep accurate records. A good log (Figure 3) should identify each item and include its serial number, if applicable. If the item is a PC, the identification should include a complete description containing the manufacturer and features such as the number and types of drives and the amount of memory. Be sure that you also identify which computer belongs to which customer.

## CUSTOMER LOG

| CUSTOMER | COMPONENT DESCRIPTION | DATE IN | DATE RTN | COMMENTS |
|---|---|---|---|---|
| D.SMITH 22 FOSTER RD. 555—5544 | DELL DIMENSION PC TAG # BS00R PENTIUM — 266 MHZ 192 MB RAM 6 GB HD CDROM & ZIP 100 | 11/12 | | WON'T BOOT UP. PROMISED BY 11/20 |
| G. WILCOX 174 OAK ST. 555—5555 | SONY MONITOR SERIAL NO. 8058566 17 INCH | 11/13 | 11/15 | COMPLETELY DEAD. REPLACED POWER CORD |
| | | | | |

## Safety

Safety begins with a clean and uncluttered work area. Floors should be clear of objects that can cause you to fall while transporting equipment into and out of the shop. Some PC components, such as monitors, can be quite heavy and awkward to move. Be sure to lift heavy equipment properly, using your legs and not your back.

Eye protection should always be available for use when performing any activity where chemicals, parts, or debris can fly into your eyes. Always wear eye protection when cleaning components with any type of compressed air or chemical spray.

## Electrical Hazards

In your shop, ensure that the power outlets are properly grounded, especially if you're using existing outlets in an older building. Check that all equipment power cords are in good condition and provide proper grounding for the equipment. Avoid wearing loose jewelry or other conductive apparel, such as rings and watches with metal bands, whenever you work around electrical equipment.

The energy in a PC's display monitor and power supply can be dangerous. Even if the power cord is disconnected, capacitors in the monitor and power supply can hold an electrical charge.

> **WARNING:** **Never open a display monitor or the power supply case unless you're experienced in working with high-voltage equipment.**

## Fire Safety

Because you're working primarily with electrical equipment and occasionally with some cleaning materials, you need to be aware of fire safety. The proper type of fire extinguisher should be conveniently located in your PC repair work area. Be sure to keep the extinguisher away from any spots where a fire may develop so that you can always get to the extinguisher.

The National Fire Protection Association (NFPA) classifies fires into three categories:

- *Class A,* which are fires burning simple combustible materials, such as wood or paper

- *Class B,* which are fires ignited from flammable liquids, such as oil, gasoline, and kerosene

- *Class C,* which are fires due to electrical causes

Fire extinguishers are labeled with symbols indicating the type or types of fires they can extinguish. Extinguishers for Class A fires have the letter A usually inside a triangle. Extinguishers used to fight Class B fires have the letter B inside a square. Class C fire extinguishers are identified by the letter C inside a circle. A good choice for your home shop is an extinguisher that carries all three designations (Figure 4).



FIGURE 4—This fire extinguisher is effective on Class A, B, and C fires.

## Setting Up Your Workshop

Throughout your PC repair program, you'll be given hands-on activities associated with maintaining, upgrading, and repairing a PC. To accomplish these activities, you'll need an area in which to work.

Your particular situation will determine the type of work area that you'll need. For example, if you're a hobbyist, you may want to set up a permanent area with minimal equipment. If you're working for a business or planning to work for a business outside of your home, you may want to set aside only a temporary work area with minimal equipment, just for the purpose of completing this program. If you intend to start your own business, you'll be more interested in setting up a permanent work area with a complete set of tools and equipment.

It's a good time to begin setting up a work area that's right for you. Beginning with your next study guide, you'll need a place to work on the PC you've obtained for this program. Use what you've learned about workshops to set up an efficient and safe work area.