Personal Computers

What is a Personal Computer?

One of the most often asked questions about personal computers—and one of the hardest to answer—is what kind of small computer product do we mean by the term "personal computer?" Datapro, for purposes of this directory, recognizes a personal computer as one having a base purchase price of about $3000 or less, and which includes software sufficient to permit a layman to gain productive use and enjoyment out of the system in a typical home, education, or small business environment.

A hallmark of personal computers is that these systems typically can be plugged in and begin working immediately, as opposed to other small computer systems that must first be professionally programmed. Personal computers are extremely flexible. They can be used for a variety of local processing tasks, and can serve as timesharing terminals or as a means to gain access to major, commercially available data bases.

At the heart of these personal computers is a microprocessor, i.e., a tiny electronic computer on a silicon chip. The first microprocessor chips were developed by Intel Corporation and can now be found in a variety of smart machines, from microwave ovens to video games to sophisticated aircraft devices. These microprocessors get their work instructions from the machine's memory bank. In this memory bank resides the Read-Only-Memory (ROM), which contains programs that give the computer the ability to interface with an external source. The contents of ROM never change, even when the machine's power is turned off. The machine's other memory, Random Access Memory (RAM), contains the programs needed to run various applications. Once the system's electricity is turned off, however, the information stored in RAM disappears.

The personal computer is usually supplied with a keyboard and a limited configuration of peripherals. Additional peripherals are widely available, either from the system vendor or independent sources. Most systems permit the use of cassette tape and/or 5¼- or 8-inch diskettes for program and data storage. The user interface generally takes place through the keyboard and a black and white CRT display, or monitor, that is provided with the system. Sometimes an interface is available that allows the user to attach his or her own color or black and white TV set as the system's display monitor.

Presently, the personal computer industry is offering the end-user greater processing capabilities via software and hardware enhancements such as communications and color graphics. Systems are more user friendly because of the inclusions of function keys on the keyboard, built-in systems diagnostics software to detect problems, and better written documentation.

The personal computer market is booming. One million units were sold last year. With the peripheral equipment and software programs that were sold along with the computers, industry revenues hit two billion dollars.

History of Personal Computers

The origins of personal computers are relatively recent. The main technological breakthrough that permitted the creation of these products was the integrated circuit (IC), or computer-on-a-chip. Although this technology has been available since 1968, it was not until the beginning of 1975 that advances in miniaturizing computer chips were combined with smaller, lower-priced input, output, and storage devices, permitting personal computers to become a practical reality.

The first personal computer was the Altair 8800, produced by the Albuquerque-based MITS, Inc., which sold in kit form during 1975 for about $400. With a working complement of peripherals, the Altair 8800 cost about $2,000. Although that system is no longer offered, its contribution to the creation of a personal computer marketplace will be well remembered. One specific feature pioneered by the Altair 8800 was the widely used S-100 interface bus to connect peripherals to the main computer board.

About a year later, Steve Wozniak and Steve Jobs began selling a system built in their garage. This system has since become the Apple—one of today's top selling personal computer systems. Also, in 1976 three other pioneering firms, IMS Associates, Polymorphic Systems, and Processor Technology, brought out the IMSAI, Poly 88, and Sol systems, respectively. These systems, like the Altair, are no longer offered, but each did its share to help the personal computer marketplace develop.

In 1977 several important new systems were developed. Commodore introduced its Personal Electronic Transactor (PET); Heath entered personal computing with its H8 and H11 systems; and Radio Shack made its initial foray into the field with its TRS-80. By the end of 1977, the key elements necessary for the personal computer industry to unfold as we know it today were all in place. The three firms who would come to dominate today's marketplace (Radio Shack, Apple, and Commodore) had already entered the field. Also, several of today's leading personal computer magazines had been started, and consumers were quickly awakening to the lure of the personal computer.

In 1978 and 1979, the whole industry broke wide open. Dozens of small and large firms brought systems to the market. Peripherals vendors introduced a huge array of low-cost products of every type. And literally hundreds of individuals and firms began offering a wide variety of software packages for the more popular systems. Personal computer systems have become more fully developed year-

Personal Computers

by-year. Today's current products are no longer the barebones, hobby-type systems that were first introduced only a few short years ago for computer enthusiasts and engineers.

At present, some of the top firms in both the consumer electronics and the computer industries have entered systems in the personal computer sweepstakes. There are now dozens of personal computers available in the marketplace. Some of the more popular units are described in reports following this one.

Current Applications

It has been said that the personal computer represents an avenue to increased personal power. As a recognition of this, personal computers are used not only for games and entertainment, but also for a wide variety of applications aimed at improving the capabilities of their individual owners. They also have found their way into use in large and small businesses.

There are currently four major usage environments in which personal computers are being employed:

● home/hobby

● education

● professional

● business

Within these environments, the principal uses are typically as follows:

● **Home/hobby**—telephone answering/dialing, computer-assisted instruction (CAI), games, music, cartoons/art, environment/home appliance control, budgeting, investment analysis, personal records, calendars, recipes, message logs, security systems, and word processing.

● **Education**—Computer-assisted instruction (CAI), budgeting, personal records, work assignments, calendars, word processing, filing.

● **Professional**—telephone answering/dialing, budgeting, general ledger, tax/payroll accounting, personal records, work assignments, filing, calendars, report preparation, security systems, and word processing.

● **Business**—telephone answering/dialing, electronic mail, budgeting, general ledger, tax/payroll accounting, personal records, work assignments, filing, calendars, report preparation, and word processing.

Within these environments nearly 1,500 discrete applications have been identified. The most popular uses of personal computers include games (played on virtually every personal computer at one time or another); text editing and report letter preparation (also done on

virtually every personal computer); music generation, general ledger accounting, education, speech recognition/generation, business inventory, personal income tax preparation, stock bond analysis, recipe storage, simulations, home appliance control, sales records, real estate investment analysis, record keeping, home budgeting, personal home asset inventory, etc.

Two of the most powerful applications of personal computers is made possible through the use of an often available data communications capability that can connect these small systems via telephone lines to other computer users via a local area network and to the enormous wealth of information available through any of the independently available commercial data bases such as The Source or Dow-Jones.

Personal computers can be clustered into a computer network to carry information that might normally be sent by mail or fascimile transmission. Additionally, they can be used by large mainframe system uses to do offline processing such as data entry, editing, printing, or other noncomputational operations. By utilizing personal computers to handle this type of processing, problems associated with line charges, down time, and slow system response which have long plagued the large system user, can almost be eliminated—without losing the computing power of the large systems.

The programming languages used on personal computers are Basic (used on virtually every personal computer), Assembly, Fortran, Cobol, APL, and Pascal.

How Are Personal Computers Sold?

The personal computer manufacturer is still trying to find the most ideal way to cash in on the booming marketplace. The first personal computers were sold by direct mail and at specialized trade shows. Although very successful initially, once the first surge of interest from engineers and other technically sophisticated computer hobbyists had been satsified, this approach quickly faded as the primary method of selling these systems. Today, there are four primary ways in which personal computers are sold.

1. Computer stores. These specialty retail outlets such as Computer Land, Compu Shop, Micro Age, and Computer Store can be either independently owned or franchises operating as part of a local or national chain of stores. The likelihood is that these stores will employ salespersons with considerable expertise to help you determine how you can use a personal computer, and to help you assemble the necessary configuration of hardware and software for your needs. In some cases, local stores may put together a hardware system with appropriate locally manufactured software and act more like a manufacturer or systems house than simply a retailer.

Personal Computers

2. General merchandise department stores. Major mass-merchandising retail chains, such as Sears, Penney's, R.H. Macy, and Montgomery Ward, have entered the personal computer market. They sell either popular personal computers or private label versions of these brands. Like computer stores, some of these chains may have contracted for special software development, and may be selling a unique configuration of equipment and software that is truly their own system. In many cases, tests are being conducted by these stores to see how successfully they can sell personal computers. Some stores have not yet made full-scale commitments to this market. Care should be taken to find out where to get on-going support if the store you buy from decides not to continue selling your chosen system.

3. Computer companies. Most computer companies, such as IBM, DEC, Hewlett-Packard, Texas Instruments, and others, are keenly aware of the potential business opportunity that personal computers represent. Many of them have already entered this dynamic marketplace with systems, and some—including DEC, Xerox and IBM have opened their own retail stores. Others sell their systems as part of the full product line of their in-the-field sales force.

Mainframe computer and minicomputer companies who enter the personal computing field directly will usually have a greater amount of computer expertise within their firms than will some small, independent personal computer manufacturers. These larger companies may also offer a sizeable base of other users among whom very helpful user groups have formed. But, in many cases, those larger manufacturers who do not sell out of retail stores may not be able to devote as much of their considerable expertise to supporting individual customers as can the perhaps less technically qualified, but more consumer-oriented, smaller independent companies.

Radio Shack occupies a special position in this distribution marketplace. With its more than 7,000 electronics retail stores and a separate chain of computer centers devoted solely to computer sales, it has a built-in distribution network to market its TRS-80 computers along with associated peripherals and software. Radio Shack plans to have an additional 100 computer centers opened by July 1982.

4. Office equipment dealers. There are thousands of these firms nationwide who are presently selling and servicing copiers, word processing systems, typewriters, etc. Mainly because of their already established base of customers, their in-place service operations, and their understanding of small business problems, these firms represent a potentially effective medium through which personal computers can be sold. Today, a growing number of office equipment dealers are beginning to test the selling of computers.

All vendors have found that a big problem in selling personal computers to date has been the lack of knowledge on the part of potential customers about what these systems can do. As we have seen, the systems can be (and many have been) applied to nearly any type of information processing activity.

Future Trends

Business applications have become the most important area of usage for personal computers. Many small professional offices already use personal computers, and more will do so.

Since it is already clear to the personal computer manufacturers that the trend toward business usage will continue to accelerate, most of them have already extended the top of their present lines upward to permit growth from individual system usage in the home, to varied uses in a full business environment.

Voice recognition devices and speech synthesizers, already available for personal computers, will increase in sophistication and will become supported in much of the applications program development work currently being planned. Also to be expected for the home is a wider range of support for appliance and other device controllers, including security and environmental control systems.

Among the other personal computer hardware and software trends that will become more pronounced in the future are: more 16-bit microprocessors employed as engines for personal computers, replacing the 8-bit devices so common today; more high-level programming language availability, such as Cobol and Pascal; and better information storage and retrieval software systems, such as data base management and user inquiry systems.

How to Buy a Personal Computer

Datapro offers the following suggestions to prospective personal computer buyers as an aid in determining what, if any, personal computer system is most suitable to your needs.

1. First, you must evaluate your own specific needs and desires that a personal computer could reasonably satisfy. Prepare a list of tasks for which you intend to use the personal computer. Identify for each task just how you expect your personal computer to be helpful to you, whether it be printing lists, visually displaying information, presenting color graphics, etc.

2. Next seek to identify and locate which systems appear to offer the hardware and software sufficient to satisfy your requirements.

To help you with this important second step, Datapro has prepared a number of reports covering some of the more popular personal computers available today. Each system is well-suited to one or more personal computing tasks. Included in this group are not only the personal systems most widely used for home/hobby applications, but also several personal computer systems often used for scientific and professional or small business applications.

Personal Computers

You must also determine whether or not you expect to use ready-made software packages, or whether you will require high quality programming language support, such as is offered with Basic, Cobol, and Pascal programming systems. It is also important to determine whether or not the types of printers, mass storage, voice I/O, music, or other peripherals devices you will need are available either from the maker of the personal computer or from independent companies.

3. Datapro recommends that your next step should be to get a hands-on trial of the system(s) you have identified as likely candidates to meet your needs. The best way to do this is to visit your local computer stores. With several thousand retail computer outlets spread across the country, there should be one or more computer stores within a reasonable distance of anyone investigating personal computers. These stores will not only have the system you are investigating, but they will also have personnel trained in their use. Further, these stores will be very agreeable to giving you a hands-on, reasonably lengthy demonstration.

4. Finally, you are ready to make your selection. At this point, you are not only selecting a particular brand of equipment and configuration of hardware software components to serve your needs, but you are also selecting a vendor, i.e., a source from which to buy this system and its service in the future.

Your hands-on exposure to personal computers through local computer stores will now prove valuable not only in picking the equipment, but also in verifying that the computer store in question is the right place for you to buy your system.

When buying through an independent sales organization, such as a local computer store, a good part of your future support will come from this store rather than from the often-distant personal computer manufacturer. Be certain that you are comfortable with this retailer, and that he or she is financially stable, reliable, and capable and willing to give you the level of support you will need.☐