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All About Small Business Computers

Compact, low-cost business data processing systems will soon be nearly as commonplace and indispensable in most offices as telephones and typewriters. The ever-increasing costs and complexities of doing business are forcing small businessmen to find new ways to cut their labor costs and gain tighter control over their operations—and a wisely chosen small computer can help immeasurably in both these critical areas.

But what, exactly, is a small business computer, and what can it be expected to do for your firm? Those are the key questions we'll try to answer in this report. We'll also discuss the companies that make small business computer systems and the makeup of their market. Then we'll explain how you can tell whether your firm could really benefit from installing a computer, and how to select the best one for your needs. And we'll wind up the report with 50 pages of detailed comparison charts that present the salient characteristics of 249 current small business computer systems from 89 vendors.

The Small Business Computer

A small business computer is an office machine that processes data entered by the user and produces calculations and reports as directed by its stored programs of instructions and the user's commands. Generally speaking, it's more accurate to think of a small business computer as a business computer scaled down than as a computer intended strictly for small businesses.

In price and performance, the small business computers span a wide range that fills the gap between conventional accounting machines at one extreme and medium-scale computer systems at the other. Though the current small business computer systems differ widely in their architecture, data formats, peripheral equipment, and software, they are generally characterized by purchase prices in the
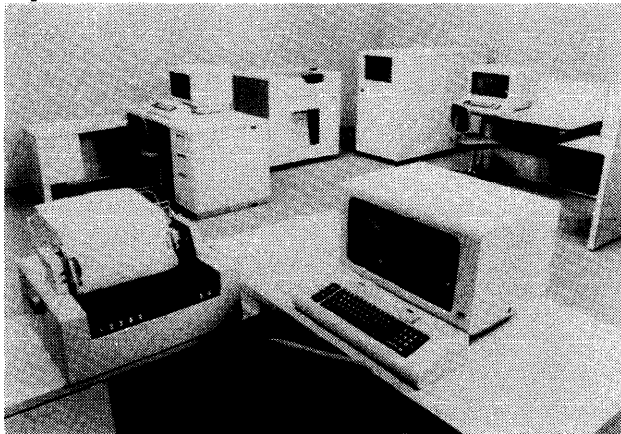
The IBM System/34 is a multi-workstation system and the newest in the IBM family of small business computers. Whereas IBM's popular System/32 is restricted to serving only one user at a time, the System/34 can handle up to eight independently functioning users plus a background output spooling task. The three-workstation system pictured has a purchase price of $59,720.

$5,000 to $100,000 range and by a strong orientation, in both their equipment and software, toward conventional business data processing applications.

These low-cost business data processing systems are known by various names, such as electronic accounting machines, office computers, electronic billing computers, or magnetic record computers. To simplify matters, we have chosen to use the generic term "small business computers" throughout this report.

A small business computer can calculate and print your payroll checks, customer invoices, and inventory status. It can print your directories or sales forecasts. It can keep track of stock on hand, stock on order, and supplies to be ordered. It can help to administer hospitals, hotels and motels, wholesale operations, retail establishments, meat packing houses, etc. In short, it can perform virtually any information handling or record-keeping operations that you do now, plus many desirable operations that cannot economically be performed by manual methods.

Physically, today's typical small business computer is made up of a processor with an integral main storage unit for data and programs, a keyboard device for data entry, a printer to record the results produced, and a magnetic disk unit for secondary (i.e., low-cost and relatively large-capacity) data storage. These four elements constitute the *input* (keyboard data entry), the *logic* (processor), the *memory* (main storage and disk), and the *output* (printer), which are the four classic elements of every computer.

Substitutions can be made for the input device (e.g., a TV-like CRT display unit with keyboard or a punched card reader instead of the typewriter), and for the output device (e.g., a card punch instead of the printer). Many systems lack the disk storage unit, while others add magnetic tape units for secondary storage and/or high-speed data input and output. However, most of the basic systems from the small business computer vendors comprise the four elements listed above.

As for operating characteristics, the internal speed of the processor and the transfer rate of its main storage unit typically permit computational speeds in the range of thousands of calculations per second. The rated speeds of the associated input devices will usually range from about 10 to 200 characters per second, while the rated output speeds will typically range from about 10 to 500 characters ▷

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▷ per second. (By contrast, the average speed of even a first-rate typist will seldom approach 10 characters per second.)

Thus, the critical factor for judging a business computer's useful speed is usually the speed at which the input and output devices operate, because the processor can operate far faster than you can either enter the data or see the results printed. Many typical uses of small business computers are operator-oriented, meaning that a single human operator tends the machine and keys in all the data. And the input and output speeds of even the most basic computer systems are usually more than sufficient to match the requirements and speed of a single operator. But as your work-load grows, you may need to add faster input and output units to the computer and switch to an "off-line" mode of data entry that involves multiple operators at keypunches or similar devices.

Storage capacity typically ranges from 8,000 storage locations to 32,000 or more. In many systems, each storage location is called a "byte" or "character" and holds one alphabetic character or decimal digit. But in many other current systems, each location is a 16-bit "word" that can contain four decimal digits or two alphabetic characters. Thus, the minimum storage capacity available in most systems, for example, could hold enough data to perform calculations on a file with 100 entries, each 50 characters long, with additional storage space left over to hold the instructions that constitute the computer's program.

In the computer field, a "configuration" is the physical makeup and arrangement of the equipment to be used. The minimum configuration typically offered by the small business computer vendors comprises a processing unit, a minimal number of storage locations, a keyboard data entry unit, and a printer. A range of additions and substitutions is then generally available either to increase the number of storage locations, to speed up the input and output functions, or to add special capabilities to the system. For instance, users of some small business computers can add an optical card reader, which can recognize data that is hand-printed or marked on cards.

In most cases, substituting a faster device or adding a special device will significantly increase the performance of a small business computer, while at the same time substantially increasing its cost. A note of caution here is that some manufacturers' minimum configurations are barely adequate to perform useful work. These cases will soon become obvious because the salesman will work diligently to convince the prospect to upgrade various elements of the system.

Usually, a small business computer is used in a manner similar to a printing calculator or an office typewriter. Even its physical appearance generally resembles that of more conventional office equipment. The small business computer is usually operated by a clerk dedicated to that one task. In use, the small business computer typically requires more training and more attention to specialized procedures than an office copier, but less than an offset printing press. No special air conditioning, flooring, or electrical work is required for most of the current small business computers.

An important recent development is the advent of small business computers capable of accepting input from two or more operators simultaneously. These "multi-terminal" systems typically accommodate from two to eight CRT display/keyboard units, thereby substantially increasing their capabilities in terms of both volume and flexibility.

Who Makes Small Business Computers?

The small business computer market is served by four distinct types of vendors. The first type is the "Fortune 500" companies such as Burroughs, Honeywell, IBM, Litton, NCR, and Sperry Rand, all of whom have vast product lines and resources. For these companies, the small business computer is just one of a broad line of products (although in the cases of NCR and Burroughs, business minicomputers now account for a very sizeable portion of total corporate sales revenues).

A second group consists of minicomputer manufacturers such as Digital Equipment Corporation (DEC), Data General, Computer Automation, Harris, Hewlett-Packard, Microdata, Wang Laboratories, and others. This group has watched the small computer marketplace mushroom in size, and now wants a piece of the action. Their answer to this segment of the marketplace is a packaged configuration consisting of a minicomputer and associated peripherals from their current product line, usually accompanied by some applications software. Most minicomputer vendors also offer assemblers and compilers for the user who wants to do his own programming or solve business problems that cannot be handled by packaged software.

System houses or turnkey vendors, such as Basic/Four, Mini-Computer Systems, Qantel, STC Systems, and many others, comprise the third group of suppliers of small business computers. This group is very similar to the second group except that the turnkey vendors generally buy minicomputers and/or peripheral devices from the manufacturers, package the configurations, and supply their own software. The prime appeal of a full turnkey system is that all software is written by the vendor; therefore, the user is not required to employ a high-priced programming staff.

Microcomputer companies are beginning to appear on the scene as the fourth group of SBC suppliers. Companies such as Applied Data Communications, Applied Systems Corporation, Cado Systems Corporation, Wintex Computer Corporation, and others are now offering microprocessor-based small business systems that sell for $20,000 or less. This group is in its infancy now, but seems destined to be a major force in the SBC marketplace in the near future.

Most of the current members of the last two groups sell small business computers and services exclusively, and in ▷

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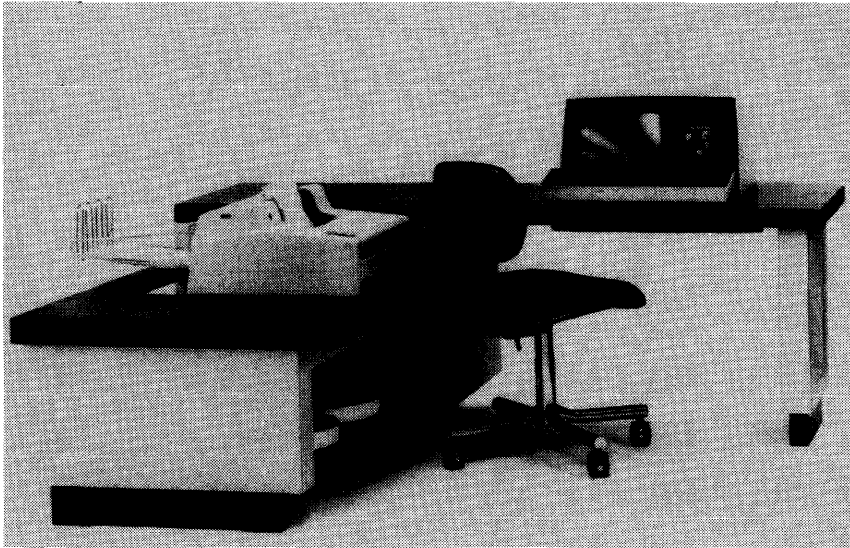
Logical Machine Corporation's Adam is an innovative product billed as "the first truly programmerless business data processing system." A highly interactive software monitor constantly prompts the user, simplifying the programming process and ensuring recovery from most user mistakes. A minimum Adam configuration consists of a central processor with 32K bytes of main memory, a 24-by-80-character CRT display/keyboard, a 10-megabyte cartridge disk drive, and a 165-cps serial printer. The basic system is priced at $39,995, with maintenance costing approximately $200 per month.

many cases are themselves small businesses. However, what they lack in size and resources is often more than compensated for by their quick reaction time to problems, general expertise, and eagerness to satisfy.

IBM, a long-time laggard in the small business computer sector of the EDP marketplace, has climbed into its accustomed position of market leadership during the last few years on the strength of two highly significant product offerings: the System/3 and the System/32.

The IBM System/3, introduced in 1969, is a strong entry at the upper end of the SBC market segment. It is offered in numerous models at system purchase prices ranging from about $40,000 to more than $300,000. With well over 30,000 installations worldwide, the System/3 ranks as one of the fastest-selling computers in history.

The newer IBM System/32, unveiled in January 1975, is the smallest and lowest-priced general business computer ever announced by the industry giant. All components of the System/32—processor, main storage, keyboard, display, printer, disk storage unit, and diskette drive—are housed in a single compact, desk-sized cabinet. What's more, IBM is billing the System/32 as a "programmerless" machine whose software, for most users, will consist entirely of preprogrammed Industry Application Packages supplied by IBM. With equipment purchase prices beginning at $33,560 and monthly rentals (on a 3-year lease) beginning at $680, the System/32 has already convinced thousands of small businesses that it's time to take their first step into computer usage. The availability of the System/32, backed by IBM's powerful marketing forces, has substantially enlarged the total market for small business computers and appears to be generating increased sales for both IBM and many of its competitors.

The IBM System/34, just introduced in April 1977, represents the next logical step in IBM's succession of small business computer systems. As compared with the System/32, the new system features more processing

power, larger memory capacity, larger disk storage capacity, and the ability to attach up to seven additional independent multiprogramming workstations to the basic system. This last feature is the most significant difference between the two systems, since the biggest single drawback to the System/32 for most potential users has been the fact that it is rigidly restricted to serving one user at a time. Thus, with the System/34, IBM has strongly endorsed the concept of multi-user, multi-terminal SBC systems of the type that have long been offered, with considerable success, by vendors such as Basic Four, Datapoint, and Microdata.

Burroughs and NCR, the perennial leaders in the SBC marketplace until the recent IBM onslaught, are still strong contenders. Both firms offer a broad range of products backed by extensive marketing and service organizations. Sperry Rand is the latest of the "Fortune 500" companies to announce a bold thrust into the SBC market. The firm's Sperry Univac Division, which had long lacked an effective SBC to complement its strong line of larger computers, corrected that oversight by introducing the Univac BC/7 in January 1977. A cardless system designed for turnkey operations, the BC/7 can consist of a processor with 32K, 48K, or 64K bytes of MOS main memory; an operator's console; up to four workstations, each with a CRT display and optional non-impact page printer; up to 3 million bytes of floppy disk storage; up to 40 million bytes of cartridge disk storage; one or two tape drives; and one or two printers. Purchase prices for the BC/7 packaged systems range from about $17,000 up to about $43,000. Sperry Univac's new commitment to the SBC field is underscored by the fact that at the time of the BC/7 announcement, nearly $25 million had already been invested in the associated organization, facilities, people, and product. Then, in June 1977, Sperry Univac purchased Varian Data Machines, a major manufacturer of minicomputers since 1967. There's little doubt that the technology developed by Varian will show up in future Univac offerings in the small business computer marketplace.

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▷ Digital Equipment Corporation, the leading builder of scientific minicomputers, offers business-oriented users its Datasystem 300 and 500 Series systems based upon the popular DEC PDP-8 and PDP-11 minicomputers. In January 1975, just 10 days after IBM introduced its System/32, DEC countered with the Datasystem 310, a complete business data processing system priced at just $14,095. The basic Datasystem 310 includes a PDP-8/A minicomputer with 8,192 12-bit words of core storage, two diskette ("floppy disk") drives, CRT display unit, and typewriter-style keyboard. Optional extras include a printer, a communications interface, and expanded main or diskette storage. DEC is marketing the Datasystem 310 in two ways: directly to end users who are prepared to write their own application programs, and through a distributorship network of software houses that will do the applications programming for less sophisticated users.

Hewlett-Packard, General Automation, Harris, and Microdata are other major suppliers of scientific minicomputers that now offer "packaged" hardware/software configurations oriented toward business data processing applications.

European-made equipment is making a much greater impact upon the small business computer market than in any other segment of the U.S. computer market. Honeywell, International Computers Limited, Olivetti, Philips, and Nixdorf are marketing equipment which they manufacture in France, Great Britain, Italy, the Netherlands, and Germany, respectively.

Who Needs Small Business Computers?

As for the market served by these firms, it is estimated that in the United States there are currently more than half a million businesses or other organizations with fewer than 150 employees. These are the primary marketing targets of the small business computer manufacturers.

Small business computers are, of course, designed principally to serve the business data processing needs of these small business and government organizations. For many of these companies, a computer—when properly selected, installed, programmed, and operated—can lead to far smoother operations and higher profits. In addition to processing routine transactions, a computer can provide reports that give management the information it needs to achieve improved customer service, reduced inventories, tighter cost control, and increased production efficiency. But in all too many cases, computers are poorly chosen, misused, and misunderstood, so that they actually become liabilities rather than assets. The best way to guard against this type of disaster is through a thorough management training program in the principles of EDP. But, since few small-company executives have the time or desire for such training, the best alternative is to seek competent outside advice in the selection and installation of an appropriate business computer system. One promising source of guidance for getting the outside help you need is likely to be your own industry, trade, or professional association.

In addition to their principal use in small companies, low-cost small business computers are also being productively used in some of the nation's largest corporations, in a variety of specialized applications such as:

● Local processing of some or all of the data generated in branch offices, divisions, and/or small subsidiaries.

● Individual, "dedicated" applications that involve extensive keyboard input and printed output, such as the preparation of accounts payable checks, insurance claim checks, and stock transfer certificates.

● "Intelligent terminal" applications, in which the small business computers perform both local data processing functions and communications control functions in company-wide distributed processing networks.

When using a small business computer that has the typical basic configuration (consisting, as stated above, of a processing unit, a keyboard for data entry, and a typewriter-style printer or low-cost line printer for data output), the operator enters all the necessary variable data for each transaction into the computer through the keyboard. The "master file" or ledger data required to process each transaction may also have to be entered through the keyboard. In systems equipped with appropriate input/output capabilities, however, the master file data can be read directly into the processor from magnetic ledger cards, punched cards, paper tape, magnetic tape, or magnetic disk, leading to greatly increased processing speeds and flexibility.

For most small business computers in most applications, the overall processing speed will be governed by the speed at which the operator(s) can key in the data for each transaction. Wherever on-line keyboard entries are involved, the overall performance of a system will rarely exceed a few transactions per minute for each on-line input station.

Many of the small business computer systems can optionally be equipped with sufficient input/output capabilities to handle conventional batch-mode data processing, in which the variable transaction data is recorded on cards or tape so that it can be read into the computer at higher speeds. This mode of operation is particularly suitable for the recently developed systems that are built around a comparatively powerful minicomputer.

As their name implies, the small business computers are designed and used predominantly for applications of the accounting and business data processing type. A much smaller (albeit growing) number of systems are also suitable for applications in the scientific, engineering, management sciences, or information storage and retrieval categories.

The firms that can and do use small business computers effectively are legion. They range from banks and savings ▷

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institutions to truckers and wholesalers. In fact, there is virtually no business enterprise that cannot benefit in some practical way from business computing. Any firm or division large enough to warrant a separate accounting treasury, or comptroller's department is a promising candidate for such equipment. Any firm with a large shipping load, purchasing department, inventory turnover, or production scheduling task is also a suitable candidate.

Does Your Organization Need One?

One of the most crucial and yet most difficult questions to answer is: "How do I know if I need a small business computer?" Realizing the nature of a business computer as a labor-saving and cost-reducing tool is the first step toward answering the question. For instance, an executive could easily make a big mistake by simply saying, "My competitors are doing it so I will, too." However, if a businessman sees that his competition is automating and is able to underbid him on contracts, then maybe his firm should realize that a business computer can help to restore competitive parity. The point is that the business computer is an effective tool for streamlining your operations—not a miracle worker.

There are many compelling reasons for considering a small business computer:

● To gain a competitive edge.

● To reduce labor costs.

● To increase productivity.

● To control escalating clerical expansion.

● To improve customer service.

● To increase profits through better cost accounting.

● To reduce inventory through closer inventory control.

● To enhance management efficiency by instituting a management reporting system.

The small business computer is sufficiently mature and flexible to handle a wide variety of applications in business, commerce, and industry. It is also competitive enough to offer suitable solutions at a reasonable cost to the prospect. Thus, an important step in deciding whether or not such a system is appropriate for you is to develop confidence in small business computers as a viable solution to your needs.

The next step is to recognize a problem area or an opportunity for growth where one exists. Any area of your business that is chronically over budget, late in meeting schedules, or operating without effective management control is a clear indication that a small business computer can probably be of help. If your firm is subject to a

cycle in which clerical workers are being hired each time work expands, a small business computer may be the way out of that cycle. All these situations are indications that some course should be taken to alleviate a problem or improve an existing company strength.

Once having recognized such a situation, your firm should conduct an informal feasibility study. This should include:

● Examination of the current business practices and operations.

● Assessment of their attributes, volume, and frequency.

● Determination of present costs and future budget to continue the present practices.

● Estimation of the costs of proposed alternatives to the present practices.

● Comparison of the *costs* and *benefits* of the current practices versus any proposed alternatives.

The feasibility study thus aims to determine whether or not it is economical and reasonable to install a business computer system (or any other new system or practice) at a given period in time. It involves a careful analysis of all the costs which are likely to be incurred during the process of converting from manual or mechanical operations to the new equipment. It also involves a careful analysis of the potential benefits that the company may gain by installing this new equipment. The feasibility study, then, attempts to measure the anticipated costs versus the potential savings in order to make an informed decision as to the most economical course of action for the company.

Buying Guidance

As with all categories of data processing equipment, the watchword in selecting a small business computer is "Buyer beware." These machines come in a wide range of types, sizes, and capabilities—with price tags to match—and there's a great deal to be gained through systematic selection of the most appropriate system for your particular needs.

But all too often, the buyers of this class of equipment have little or no understanding of data processing principles and are likely to buy the wares of the salesman who arrives first or sells hardest.

No company should *ever* buy a computer from the first salesman who comes through the door. It's always far wiser to check out the offerings of at least a few of the other major suppliers, and you shouldn't hesitate to play one vendor against another in an effort to get the most for your money. Just remember that all promises of extra software, technical support, or other concessions should be specifically included in the final contract.

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Distribution Management Systems' DMS 1000 is a purchase-only turnkey system built upon the DEC PDP-8/e minicomputer. Featuring COBOL, FORTRAN, BASIC and Assembler languages, the system in a basic configuration can be purchased for $65,500. The operating system supplied with the DMS 1000 allows main memory to be partitioned to handle up to 30 users simultaneously.

▷ Prospective users who make a sincere effort to select the most appropriate equipment for their needs are likely to encounter a number of frustrations. Many of the small accounting computers are very poorly documented. The sales brochure and even the technical manuals often seem to be artfully contrived to conceal more than they reveal about the equipment's true characteristics and capabilities. The salesmen aren't likely to be much more helpful; typically, they've been trained to sell "instant solutions" to data processing problems rather than specific hardware or software. Clearly, the assumption is that the buyers of these machines are unsophisticated souls who have no reason to know or care what the basic product specifications are.

Before seriously considering the acquisition of any small business computer, you should demand:

● Detailed specifications of all the pertinent hardware and software.

● A full-scale demonstration of the equipment on at least one of your own principal applications—or, if that's not practical, on a demonstration program whose functions are similar enough to your own needs so that you can draw realistic conclusions about the system's processing speed and ease of programming and operation.

● A detailed proposal that spells out exactly what equipment, software and *technical support* will be supplied,

estimated processing times for each of your applications, all responsibilities of both the vendor and the buyer, and the total purchase price or monthly rental price.

● A list of users in your geographical area who are employing the system for applications similar to yours. Talk to several of these users and find out as much as you can about their experiences. While they may not be able to give you much help in developing a sophisticated comparison to other alternative systems, they *can* give you a good idea of what pitfalls to watch out for in installing and using that particular system. Another excellent source of user experience data is DATAPRO 70 Report 70C-010-40, *User Ratings of Minicomputers and Small Business Computers.*

A critically important area to be evaluated is *software* —the programming packages and languages used to program the computer and thereby direct its operations. It is important that you carefully investigate the available software. This investigation should include the programming languages, preprogrammed utility packages such as sorts and file maintenance, and application packages such as payroll, inventory control, general ledger, etc.

Vendors' claims and promises concerning the availability and capability of software should be carefully checked. This is particularly true of software that has been announced but not yet released. Vendors have frequently failed to live up to their marketing publicity.

Since small business computer users typically start with no programming staffs of their own, it is important that appropriate program packages be available to fit your specific requirements. If not, you should require the vendor to take on full responsibility to write and test the initial programs you'll need. Otherwise, you'll have to either recruit and train your own programmers or pay an outside software firm to develop your programs.

The availability of reliable and qualified vendor support for both equipment maintenance and software aid is another vitally important factor in the small business computer environment. The limited resources generally available to small computer users make you depend heavily on your vendor for such assistance. In many cases the vendor will even design the initial system and make any required changes to his program packages for you. Thus, the ability of the vendor to render competent and continuing service in these matters is a vital concern to you.

Some vendors do not offer equipment maintenance and/or software to complement their hardware offerings. In this case, the user must deal with independent firms in order to complete the package. In one respect this is good, because overall costs may well be lower. However, when a problem occurs, the finger-pointing game can begin; one vendor blaming the other for the system's malfunction. Fortunately, this kind of reaction is in the ▷

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▷ minority, and despite the potential for problems, the multi-vendor approach can work well.

Most potential users of an SBC naturally raise the question of purchase versus lease. The single most important consideration is the length of time that this particular system is likely to be able to handle the data processing requirements of your company. Is there room for system expansion, with regard to both the processor and the peripherals, or is this the top of the line? In most cases, it is not a wise decision to make your first system the most powerful system offered by a particular vendor. If your company's operations expand, how will you expand the system? Will you have to acquire a new and more expensive processor? Or, worse yet, will you have to change vendors? Generally, if you are confident that a particular system can handle your data processing needs for five years or more, then purchasing the system will be advantageous. However, if you have selected the top of the line or if there are fewer than five years of potential life in the system, you will probably be better off to lease.

If all this buying advice sounds like too much trouble, or just plain incomprehensible, your company (like many others) could be heading for serious losses of time and money through installation of an unsuitable computer system. In that case, you should seek help from responsible industry or trade associations with problems similar to your own and/or from a qualified independent consulting firm.

Alternatives

There are several other alternatives you might want to consider before deciding that a small computer system is the answer to all your problems. Many small companies (fewer than 200 employees and sales of less than $5 million) have selected programmable calculators, computer service bureaus, or time-sharing companies to provide the same or comparable services. Each user must decide which alternative provides the most cost-effective solution to his problems. Beyond that, decisions must be made regarding expandability, flexibility, ease of operation, reliability, turnaround time, compatibility with present operations, and the desirability of keeping all operations in-house. After careful consideration is given to these aspects and any other factors peculiar to your operations, an informed decision can be made as to which approach will work best in your company.

The Comparison Charts

The principal characteristics of 249 small business computers from 89 vendors are presented in the accompanying comparison charts. All of these systems are currently being marketed in the United States. Nearly all of the information in the charts was supplied and/or verified by the manufacturers or U.S. suppliers during June and July 1977; their close cooperation with the Datapro Research staff in the preparation of these charts is gratefully acknowledged.

No report on today's small business computers could be totally complete. The field of suppliers is just too large and growing too fast. We have, however, made every reasonable effort to include all of the major suppliers and a high proportion of the smaller ones as well. The absence of any company's products from these comparison charts means either that the company was unknown to us or that it failed to respond to our repeated requests for information.

The comparison chart entries and their significance to potential users of small business computers are explained in the following paragraphs, together with some useful guidelines for selecting the equipment that will most effectively meet your needs.

Data Formats

This section of the comparison charts describes the formats used to store and process data within each system.

Word length is the number of bits (binary digits) of data that can be stored in or retrieved from the internal storage unit during a single-cycle. Some SBC's have a "fixed word length," meaning that each machine word or operand always has the same number of bits, digits, or characters. Others have a "variable word length," meaning that their operands may consist of a variable number of bits, digits, or characters. In the latter case, the "word length" entry shows the number of data bits used to represent each byte or charater within the variable-length operands.

Digits per word is the number of decimal digits that can be represented within each machine word as defined above. At least four binary bits are required to represent each decimal digit, and in some systems six or eight bits are used.

Bytes (characters) per word is the number of alphanumeric characters that can be represented within each machine word as defined above. Most systems use either six or eight bits to represent each character.

Operand length is the length of each data element upon which such basic internal processing operations as addition and subtraction are performed. Fixed-word-length computers usually have an operand length of one word. For variable-word-length computers, the ranges of permissible operand lengths for addition and subtraction are shown.

Instruction length is the number of words (or bits) used to specify each operation to be performed by the system. In general, each instruction indicates the specific operation to be executed (add, multiply, move, print, etc.) and the storage locations of one or more of the operands involved.

CPU

Model indicates the manufacturer and model of the minicomputer used as the system's central processing unit (CPU). In some cases this entry will be identical with the ▷

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entry at the top of the chart; however, in the case of a packaged turnkey system, the entries will differ.

Add time is the time required, in microseconds, to develop the arithmetic sum of two operands. It is a widely used measure of computer performance—but a figure that turns out to be of comparatively little importance in the selection of many SBC's. The reason is that the overall speed of many of these systems is largely determined by the operator's keying speed. Add times for the systems covered in our survey span the range from a few microseconds to more than half a second—yet in many applications the key question is still whether the operator can "beat the machine." If not, the machine is probably as fast as it needs to be for these keyboard-oriented business applications. (It should be noted that for larger equipment configurations, in applications where there are two or more operators at separate terminals or where the transaction data is prerecorded on cards or tape, add times—and internal speeds in general—become highly significant considerations.)

Number of programmable registers. A register is a device that stores a small quantity of data (usually one word) and serves some special purpose. Most computers have one or more accumulators (in which arithmetic operations are performed), an instruction register, and a sequence counter. Multiple registers can facilitate programming and increase program execution speeds. In many small computers, reserved locations in internal storage, rather than special hardware elements, serve as registers in order to keep the cost down. The comparison charts show the number of programmable registers and their capacities in all cases where the manufacturers have released this information.

Number of I/O ports is an indication of the input/output capability and expandability of the system. Generally, each port allows the user to interface one peripheral device to the system, although multiple disks, CRT's or communication lines are often interfaced to one I/O port. Two numbers are given wherever possible, the first indicating the number of ports included on the basic system and the second showing the maximum number of ports that can optionally be included. Some of the figures are quite large and indicate that the vendors took into consideration the use of multiple-device interfaces and the maximum number of terminal devices theoretically connectable. It should be noted that additional hardware, in the form of expansion chassis and power supplies, may have to be added to achieve the maximum I/O capability.

Internal Storage

One of the principal characteristics that distinguishes computers from adding machines and conventional accounting machines is the provision of an internal storage unit capable of holding and selectively retrieving a significant quantity of data and/or instructions. This section of the comparison charts describes each system's internal storage facilities.

Type indicates whether the system uses core or MOS (semiconductor) memory. Magnetic core storage has been widely used for more than a decade, and has proved to be fast, flexible, and reliable. Semiconductor storage, which is rapidly superseding core storage as the principal storage medium for large computers, is becoming quite popular in business minicomputers as well. When both types of memory are available for a system, we've made every attempt to denote the specifications for both.

Capacity of basic system specifies the amount of memory, in bytes, included in the basic system. The amount of internal storage is one of the most significant characteristics in appraising the power of any computer. The amount of productive processing that a computer can perform during any one run is largely determined by the number of instructions and/or operands it can hold.

Maximum capacity, bytes shows the largest memory size available for this model; *increment size, bytes* indicates the size of the memory modules that can be added to expand the basic system.

Cycle time, microseconds is the minimum time interval that must elapse between the starts of two successive accesses to any one storage location. The storage cycle time normally ranges with word length as one of the most significant individual indicators of a computer's performance potential. However, as discussed earlier, the throughput of the equipment covered in this report is frequently determined by the operator's keying speed rather than by the machine's internal performance.

Access time, microseconds is the actual elapsed time between the CPU's request for data and the time when that data is received (read). In core memory, the access time is usually one-half the cycle time; MOS memories do not display a similar relationship.

Mass Storage Capabilities

The inclusion of mass storage devices (magnetic disk units) can greatly increase the data storage and processing capabilities of a business data processing system. Disk units enable millions of characters of information to be constantly accessible to the computer. Moreover, any desired record can be retrieved, updated, and re-recorded on the disk, uusally within a fraction of a second.

By replacing or augmenting slower, less flexible file storage media such as punched cards, paper tape, or magnetic ledger cards, disk units can enable small business computers to handle applications and processing volumes that would otherwise be impossible. The principal disadvantages of disk units are their comparatively high costs and the software complexities that are encountered by users who attempt to harness their full potential. One or both of these considerations may make disk units impractical for many small computer buyers, despite the obvious appeal of disk-oriented data processing.

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One of the latest entries in the desk-top computer race is the Compucorp 625, a system incorporating a 16-line by 64-character CRT, up to two mini-floppy disk drives, a 40-column printer, and a standard teleprinter keyboard with 10-key numeric pad, all in a neat package. The 625 is built around a Zilog Z80 microprocessor with up to 65,536 bytes of memory. The operating system is diskette-based and requires a minimum of 15K bytes for residence in conjunction with the only available language, Extended BASIC. For convenience of operation, a 20-key row of special function keys can be customized for individual applications.

▷ The diskette, or "floppy disk," is an innovation that can significantly reduce the cost of disk-oriented data processing. The diskette itself consists of a flexible Mylar disk, about 8 inches in diameter, that is permanently housed in a plastic envelope. It can serve as an input/output and/or random-access storage medium that is considerably smaller in capability and slower in performance than conventional disk units—but also far lower in cost. Introduced by IBM in 1972, diskettes and diskette drive units are now being produced by dozens of vendors and are finding their way into numerous small business computer systems, such as the IBM System/32 and DEC Datasystem 310. Recent enhancements to the floppy disk concept include more concentrated data storage and "flippies" (floppy disks that utilize both sides of the diskette), allowing more data to be stored on-line.

The other, more conventional types of mass storage devices, cartridge and disk pack drives, provide access to far more data and at significantly faster rates. Unfortunately, they also carry price tags several times higher than their floppy counterparts. Most of these units employ cartridges or disk packs that can easily be removed from the drive units and interchanged in much the same manner as magnetic tape reels.

Some cartridge-type units either use nonremovable media or use two cartridges, one fixed and the other removable. Nonremovable disks impose two important limitations. First, the system's file storage capacity is effectively limited to the amount of information that can be stored on-line. Second, disk dumps to create backup files for efficient restart procedures in case of catastrophe are not available to the user.

Interchangeable disks, conversely, provide great flexibility and make it practical to use small business computers effectively for both sequential and random data processing applications. In sequential applications, files of virtually unlimited size can be handled through the use of multiple disk packs or cartridges.

Fixed-head (head-per-track) disk and drum units can provide much faster access to on-line data than any other type of mass storage device. The reason is that there is no loss of time due to head positioning because a head is provided for each track. The only delay is rotational delay (latency), or the time required for the desired data to move under the read/write head. But the price of this type of equipment is higher than that of the preceding varieties, and less data can be stored on-line. Fixed-head devices are used when data bases are relatively small and very rapid access to the information is required. Most SBC users are not faced with such demanding requirements, but for those who need them, the devices are offered by some vendors.

Entries in this section of the charts fall into four categories: *floppy disk drive, cartridge disk drive, pack disk drive,* and *fixed-head disk/drum.* The entries indicate which devices are standard on the basic system and which ones are optional or not available.

Some SBC's are not marketed as packaged systems; thus, the user is required to pick and choose the particular devices that best suit his needs. In this case, all peripherals are indicated as optional, and this should be reflected in a lower "basic system" price.

These entries also specify the maximum quantity of disk-stored information that is directly accessible to the computer at any one time. The indicated figure may be the capacity of a single disk drive or the total capacity of two or more (typically, four to eight) drives that can be connected to one controller. It is difficult to imagine an ▷

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▷ SBC user wanting more disk storage; but if an I/O slot is open, theoretically, another controller and its associated drives can be added.

Keyboard Input

The principal source of input to most small business computers is data keyed in by a human operator. Therefore, the keyboard facilities for on-line data entry deserve careful consideration. Entries denote whether each type of keyboard is standard on the basic system, optional, or not available.

Alphanumeric (typewriter) keyboard. Virtually all of the systems covered in our survey include a keyboard, arranged in the conventional typewriter format, that permits direct entry of both alphabetic and numeric information.

10-key numeric keyboard. A 10-key adding-machine-style keyboard, standard in many of the systems and optional in others, permits all-numeric data to be entered at considerably higher speeds than via a typewriter-style keyboard. The numeric keys are usually accompanied by control keys which activate various machine functions.

Full accounting keyboards, with multiple columns of 9 or 10 keys each, have nearly disappeared from the SBC field, though they are still available for a few machines.

Input/Output Devices

Many SBC's can be equipped with additional input/output devices such as a *paper tape reader, paper tape punch, punched card reader, punched card punch, punched card reader/punch, serial printer, line printer, reel-to-reel tape drive, cassette tape drive, cartridge tape drive, magnetic ledger card device,* and *CRT.* Chart entries depict which devices are standard on the basic system and which ones are optional or not available. Once again, non-packaged systems will have all the available I/O devices listed as optional. The comparison charts also indicate the rated speed, or range of speeds, available for each peripheral device wherever that information could be obtained.

Punched tape, punched cards, and magnetic tape can be used to store master file records or to accumulate previously recorded transaction data. It's worth noting that many of the paper tape readers and punches employed in these systems can also accommodate edge-punched cards, which represent an effective unit-record storage medium for many applications. Also, many tape drives in use on SBC's are now of the cassette or cartridge variety. Cassettes and cartridges offer increased convenience in that they can be transported and stored with little fear of damaging the data which has been recorded. What's more, price tags for cassette and cartridge drives are significantly lower than those of the more conventional reel-to-reel variety, but once again the trade-off of slower transfer rates and reduced on-line storage must be accepted.

Serial (character-at-a-time) printers are enjoying increased popularity with the prolific growth of the small business computer marketplace. The main reason is price; serial printers can provide excellent-quality hard-copy reports for far less money than the line-at-a-time printers used with larger computers. However, for users who require faster printing capabilities, line printers are also available for many SBC's. Serial printers generally range in speed from about 30 to 600 or more characters per second (cps), while line printers operate at speeds of 100 to 2000 or more lines per minute (lpm). The user who needs faster printed output can obviously get it, but he must be willing to pay the higher price tag associated with the line printers.

Magnetic ledger cards have long been a popular input/output medium for business/accounting minicomputers, though they are now decreasing in popularity. Their principal attraction is that they enable small businesses to retain the individual, hard-copy ledger records they have long been accustomed to using. In addition, machine-readable data can be recorded on the cards, usually on one or more vertical magnetic "stripes." Identity and status information about each account can be recorded on the appropriate card in both printed and magnetically encoded form, and the encoded data can be re-read and updated whenever necessary. Thus, magnetic ledger cards combine many of the advantages of both traditional visible records and machine-readable media such as punched cards or magnetic tape. Their chief disadvantage is that the low speed of most of the available card-handling equipment precludes the use of magnetic ledger cards in high-volume data processing applications.

CRT's are becoming increasingly important to the small business computer. Many systems now include a CRT display and its associated keyboard as the principal means of entering data into the system. In fact, on many SBC's, one or more CRT/keyboard units represent the *only* way to enter data into the system. The comparison charts indicate the capacity of the CRT, in number of lines and characters per line, whenever possible.

Communications Capabilities

Communications capabilities enable some of the small business computers to function as "intelligent terminals" in data communications networks. An interface equips the small computer to send and receive data over a common-carrier communications link, usually to a larger central computer installation. The small computer's internal processing and storage capabilities enable it to do some data processing locally and to handle a variety of code translation, editing, and control functions in connection with the data communications activities.

Maximum no. of lines indicates how many communications lines can be handled by a particular system. The types of lines are specified in the next two entries. ▷

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▷ *Synchronous and asynchronous* have entries of standard, optional, or no, indicating their availability, and also a notation as to the speed of each line in bits per second (bps). Most entries will be of the type "to 4800 bps," indicating one or more transmission speeds up to a maximum of 4800 bps.

Software Support

Virtually as important as the computer hardware are the software and technical support each manufacturer furnishes to aid the user in utilizing the hardware effectively. The available software (if any), together with the pricing policies for both software and support, are summarized in this section of the comparison charts.

COBOL (COmmon Business Oriented Language), *RPG* (Report Program Generator), *FORTRAN* (FORmula TRANslator), and *BASIC* (Beginners All-purpose Symbolic Instruction Code) entries specify whether a particular compiler is available or not.

A compiler is a software tool designed to shift part of the program preparation task from the user to the computer itself by converting programs written in a simplified, procedure-oriented language into machine-language object programs. Compilers are now used in virtually all large and medium-scale computer installations because of their demonstrated ability to slash programming costs—and they are becoming increasingly available for the small business computers. This trend is possible because of the more powerful central processors now being used, since compilation is an intricate process that requires more storage space and processing power than the earlier small business computers provided. Where compilers are offered, however, they frequently limit the programmers to restricted subsets of the standard programming languages and/or require the use of a larger computer to perform the compilation process.

An *assembler* is a special-purpose program that uses the computer's power to facilitate the preparation of other programs. It enables the programmer to write his own program in a simplified format that uses mnemonic operation codes and symbolic operand addresses. The assembler program then converts these symbolic instructions into their machine-language equivalents, producing computer programs ready for loading and execution. Entries here indicate the availability of an assembler or, in some cases, a macro assembler.

A macro assembler is another software tool to aid the programmer and make his job a little easier. Macro routines can be called by the programmer and copied right into his program. This saves the programmer from having to recode the routine each time it is used and also eliminates the possibility of keying errors when that part of the program is entered. As usual, there is a price to pay: the use of macros usually wastes memory space.

Other programming languages specifies languages such as ALGOL, SNOBOL, or proprietary languages that are

available from a vendor for use on a particular SBC. The key word of warning here is that if you use a language that is unique to a vendor, you will be faced with a big problem if someday you decide to change vendors. Your investment in software will be lost, since the programs will not operate on any other system without extensive conversion work.

Multiprogramming gives an indication as to the power of the small business computer. Entries here stipulate yes or no, and, if multiprogramming is available, the number of partitions in memory. Multiple partitions allow for concurrent operation of several programs, thus permitting more processing to be accomplished in less time.

Some responses indicate the actual number of hardware partitions, generally two or three, while other responses are geared to the number of independent jobs that can be functioning at one particular time. The difference lies in the fact that multiple jobs may be able to function within the same partition. Although the responses differ, they are all important and help to describe the overall capabilities of the systems.

Language implemented in firmware and *operating system implemented in firmware* tell the reader whether or not the language processor and/or the operating system are contained in microcode. The entries stipulate yes, partially, or no to indicate the extent of firmware implementation. An advantage to the user is that a language and/or operating system implemented in firmware frees up more memory space for the user's programs and data. Also, the microcode is usually inaccessible to the user (generally contained in read-only memory), eliminating any possible tampering with the language processor or operating system and reducing chances for error. A third advantage derived from firmware implementation is the ability to create more sophisticated and complex functions at the hardware level. Microcode routines can be substituted for often-used subroutine, thereby increasing system performance.

General accounting packages indicates the availability of already-written software to handle the normal accounting functions of a company. The most common business functions include payroll, accounts payable, accounts receivable, inventory control, and general ledger accounting. If available, and if these programs can be tailored to meet the requirements of a particular company, they will allow the user to become operational in far less time and at a substantial saving in software development costs.

Industry application areas denotes specific areas where each vendor specializes. Turnkey vendors often take one segment of the marketplace and develop in-house expertise to the point that their hardware and software combination becomes a ready-made answer to the problems of a large class of users. Some current areas of specialization include hospitals, automobile dealers, the distribution industry, trucking firms, and the financial industry. If the vendor's specialized software can be tailored to the user's exact needs, or if the user can learn to live ▷

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▷ within the constraints of the existing software, thousands of dollars worth of programming effort can be saved. A library of pertinent applications programs can be a valuable asset when selecting an SBC. Space precludes a complete listing of available applications software in the charts, so the entries attempt to summarize and present the vendor's areas of heaviest concentration.

The availability of a *data base management system* is becoming more important to users of small business computers. A DBMS is a software system that is intended to manage and maintain data in a nonredundant structure for the purpose of being processed by multiple applications. It organizes data elements in some predefined structure and retains relationships between different data elements within the data base. The main advantage to the user of a data base management system is that information retrieval and report generation are made much easier with one common data base.

File access methods supported tells the user which methods are supported by the software available for a particular system. The entries include random, sequential, indexed sequential, and direct access. These four file access methods are the most popular, but there are others in use. In most instances it is desirable to have several access methods supported so that you can choose the one most suitable for each application.

Software separately priced tells whether the software described in the preceding entries, and any other available software, is included in the equipment price or offered at some additional cost. Some systems have the entry "some," which usually indicates that the company provides the operating systems and language processors bundled with the hardware, but charges for applications software packages. Separate pricing of software was virtually unheard of in the computer field until June 1969, when IBM "unbundled" by placing separate price tags on many of its software products and professional services. Since then, the various manufacturers have adopted a wide range of software pricing policies.

Technical help separately priced indicates whether the services of the manufacturer's technical support staff are included in the equipment cost or separately priced. Nearly every company that is installing a computer for the first time will need a good deal of help from the equipment maker's systems analysts, programmers, and/ or instructors (or, alternatively, from an independent consulting firm). In fact, the equipment supplier does *all* the programming for the majority of small business computer installations (more than 90 percent, in the case of one major supplier). The additional cost of these services, if any, should be carefully estimated and considered in all equipment comparisons.

Pricing and Availability

Purchase price of basic system shows the minimum purchase price of a system equipped to perform basic

business data processing functions. All of the facilities identified as "standard" in the charts (but none of the "optional" ones) are included in the listed prices. The addition of expanded storage capacities or optional input/output capabilities can lead to large price increases in nearly every case. Any additional information about the basic system or packaged system (if one exists) not covered in specific chart entries appears in the *Comments* section. For detailed pricing information, the manufacturers should be contacted directly.

Monthly rental of basic system specifies the monthly rental for the basic configuration of each system, as described above. All rental prices are based on a one-year lease and include equipment maintenance unless otherwise indicated. Longer-term leases are frequently available at lower monthly charges. Some systems are not available on a rental basis from the vendor and are so specified by an entry of "purchase only." In such cases, a prospective user can nearly always obtain a full-payout lease for the SBC of his choice from an independent leasing firm.

Date of first U.S. delivery tells when the first production models of each system were delivered (or are scheduled to be delivered) to customers in the United States.

Number installed in U.S. to date shows how many systems of each type had been delivered to U.S. customers as of approximately June 30, 1977. Nearly all of the figures were supplied by the manufacturers themselves.

Comments

This final entry on the comparison charts is used to explain or amplify the preceding entries and to provide other pertinent information about each system's hardware, software, pricing, or applications.

Suppliers

Listed below, for your convenience in obtaining additional information, are the full names, addresses, and telephone numbers of the 89 suppliers whose products are listed in the comparison charts that follow.

Advanced Information Design, 745 Distel Drive, Los Altos, California 94022. Telephone (415) 961-0500.

A.K. Industries, P.O. Box 286, Skippack, Pennsylvania 19474. Telephone (215) 584-1776.

Anderson-Jacobson, Inc., 1065 Morse Avenue, Sunnyvale, California 94086. Telephone (408) 734-4030.

Applied Data Communications, 1509 East McFadden, Santa Ana, California 92705. Telephone (714) 547-6954.

Applied Data Processing, Inc., 33 Bernhard Road, North Haven, Connecticut 06473. Telephone (203) 787-4107.

Applied Digital Communications, 214 W. Main St., Moorestown, New Jersey 08057. Telephone (609) 234-3666. ▷

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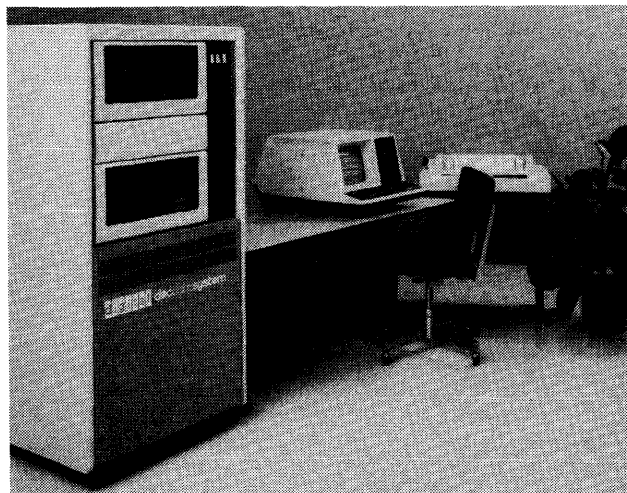
General Information Systems has chosen the DEC Datasystems as the foundation for its SBC systems. Main application packages offered include financial control, manufacturing control, order entry and inventory control, accounts receivable, accounts payable, and payroll. All of these packages can be used on any of the Datasystems from the 322 through the 570. Pictured here is a Datasystem 530.

▷ *Applied Digital Technology, Inc.,* 8550 West Bryn Mawr Avenue, Chicago, Illinois 60631. Telephone (312) 694-4190.

Applied Systems Corp., 26401 Harper Avenue, St. Clair Shores, Michigan 48081. Telephone (313) 779-8700.

J. Baker & Associates, 5135 W. Golf Road, Skokie, Illinois 60076. Telephone (312) 677-9760.

Basic/Four Corporation, 18552 MacArthur Boulevard, Santa Ana, California 92707. Telephone (714) 833-9530.

Basic Timesharing Inc., 650 North Mary Avenue, Sunnyvale, California 94086. Telephone (408) 733-1122.

Binary Data Systems, Inc., 88 Sunnyside Boulevard, Plainview, New York 18803. Telephone (516) 822-1585.

Burroughs Corporation, Burroughs Place, Detroit, Michigan 48232. Telephone (313) 972-7000.

Business Controls Corporation, 507 Boulevard, Elmwood Park, New Jersey 07407. Telephone (201) 791-7661.

Business Systems Products, Inc., 2121 Campus Drive, Irvine, California 92715. Telephone (714) 752-1799.

Cado Systems Corporation, 2730 Monterey Street, Torrance, California 90503. Telephone (213) 320-9660.

Cascade Data, Inc., 300 Kraft Avenue, S.E., Grand Rapids, Michigan 94508. Telephone (616) 942-1420.

CDA, Inc., 470 Commercial Avenue, Palisades Park, New Jersey 07650. Telephone (201) 944-2500.

Century Computer Corporation, 1601 North Main Street, Walnut Creek, California 94596. Telephone (415) 933-6736.

Complete Computer Systems, 1 Fairway Plaza, Huntingdon Valley, Pennsylvania 19006. Telephone (215) 947-7900.

Compucorp, 12312 W. Olympic Boulevard, Los Angeles, California 90064. Telephone (213) 820-5611.

Compudata Systems, Inc., 772 Post Road East, Westport, Connecticut 06880. Telephone (203) 226-4791.

Computer Automation, Inc., 18651 Von Karman Avenue, Irvine, California 92664. Telephone (714) 833-8830.

Computer Covenant Corporation, 136 Old Farms Road, West Simsbury, Connecticut 06092. Telephone (203) 658-6697.

Computer Hardware, Inc., 4111 North Freeway Boulevard, Sacramento, California 95825. Telephone (916) 929-2020.

Computer Horizons Corporation, 747 Third Avenue, New York, New York 10017. Telephone (212) 371-9600.

Computer Interactions, Inc., P.O. Box 1354, Roslyn Heights, New York 11577. Telephone (516) 487-9810.

Control Data Corporation, P.O. Box 0, Minneapolis, Minnesota 55440. Telephone (616) 853-4656.

Corstar Business Computing Co., Inc., One Aqueduct Road, White Plains, New York 10606. Telephone (914) 428-5550.

Data Communications Corp., Minicomputer Division, 3000 Directors Row, Memphis, Tennessee 38131. Telephone (901) 332-3544.

Data General Corporation, Route 9, Southboro, Massachusetts 01772. Telephone (617) 485-9100.

Datapoint Corporation, 9725 Datapoint Drive, San Antonio, Texas Telephone (512) 690-7000.

Decision Data Computer Corporation, 100 Witmer Road, Horsham, Pennsylvania 19044. Telephone (215) 674-3300.

Design Data, Inc., 238 Main Street, Cambridge, Massachusetts 02142. Telephone (617) 661-7710.

Digital Computer Controls, Inc., 12 Industrial Road, Fairfield, New Jersey 07006. Telephone (201) 227-4861.

Digital Equipment Corporation (DEC), Parker Street, PK 3-2, Maynard, Massachusetts 01754. Telephone (617) 897-5111.

Digital Scientific Corporation, 11455 Sorrento Valley Road, San Diego, California 92121. Telephone (714) 453-6050.

Digital Systems Corporation, P.O. Box 396, Walkersville, Maryland 21793. Telephone (301) 845-4141.

Dimis, Inc., 1060 Highway 35 South, Middletown, New Jersey 07748. Telephone (201) 671-1011.

Display Data Corporation, Executive Plaza IV, Hunt Valley, Maryland 21031. Telephone (301) 667-9211.

Distribution Management Systems Inc., 11 DeAngelo Drive, Bedford, Massachusetts 01730. Telephone (617) 275-2000.

Educomp-Quodata Corporation, 196 Trumbull Street, Hartford, Connecticut 06103. Telephone (203) 768-6777.

Financial Computer Corporation, 412 W. Redwood Street, Baltimore, Maryland 21201. Telephone (301) 837-9510.

Four-Phase Systems, Inc., 19333 Vallco Parkway, Cupertino, California 95014. Telephone (408) 255-0900.

GRI Computer Corporation, 320 Needham Street, Newton, Massachusetts 02164. Telephone (617) 969-0800.

General Automation, Inc., 1055 S. East Street, Anaheim, California 92805. Telephone (714) 778-4800.

General Information Systems, 2024 N. Broadway, Santa Ana, California 92706. Telephone (714) 834-0220. ▷

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▷ *Harris Corporation, Computer Systems Division,* 1200 Gateway Drive, Fort Lauderdale, Florida 33309. Telephone (305) 974-1700.

Hewlett-Packard, Calculator Products Division, P.O. Box 301, Loveland, Colorado 80537. Telephone (303) 667-5000.

Hewlett-Packard, Data Systems Division, 11000 Wolfe Road, Cupertino, California 95014. Telephone (408) 257-7000.

Hewlett-Packard, GSD Division, 5303 Stevens Creek Road, Santa Clara, California 95050. Telephone (408) 249-7020.

Honeywell Information Systems Inc., 200 Smith Street, Waltham, Massachusetts 02154. Telephone (617) 890-8400.

IBM Corporation, General Systems Division, P.O. Box 2150, Atlanta, Georgia 30301. Telephone (404) 256-7000.

International Computers (USA) Limited, 555 Madison Avenue, New York, New York 10022. Telephone (212) 486-7400.

Jacquard Systems, 2502 Broadway, Santa Monica, California 90404. Telephone (213) 829-3493.

Litton Industries, Inc., Sweda International Division, 34 Maple Avenue, Pine Brook, New Jersey 07058. Telephone (201) 575-8100.

Logical Machine Corporation, 887A Mitten Road, Burlingame, California 94010. Telephone (415) 692-4970.

Medical Computer Sciences, Inc., 2400 West Bay Drive, Largo, Florida 33540. Telephone (813) 581-8721.

Microdata Corporation, 17481 Red Hill Avenue, Irvine, California 92705. Telephone (714) 540-6730.

Mini-Computer Systems, Inc., 525 Executive Boulevard, Elmsford, New York 10523. Telephone (914) 592-8812.

Minuteman Computer Corporation, 230 Second Avenue, Waltham, Massachusetts 02154. Telephone (617) 890-4070.

Modular Computer Systems, Inc., 1650 McNab Road, Ft. Lauderdale, Florida 33309. Telephone (305) 974-1380.

Mylee Digital Sciences, Inc., 155 Weldon Parkway, Maryland Heights, Missouri 63043. Telephone (314) 567-3420.

NCR Corporation, Main & K Streets, Dayton, Ohio 45409. Telephone (513) 449-2000.

Nixdorf Computer Inc., O'Hare Plaza, 5725 East River Road, Chicago, Illionois 60631. Telephone (312) 693-6600.

Norfield Datasystems, Inc., 3 Depot Place, Norwalk, Connecticut 06855. Telephone (203) 853-2777.

Northrop Data Systems, 19000 South Vermont Avenue, Torrance, California 90502. Telephone (213) 532-1510.

Olivetti Corporation of America, 500 Park Avenue, New York, New York 10022. Telephone (212) 371-5500.

Pako Corporation, 6300 Olson Memorial Highway, Minneapolis, Minnesota 55440. Telephone (612) 571-6466.

Philips Business Systems, Inc., 175 Froelich Farm Boulevard, Woodbury, New York 11797. Telephone (516) 921-9310.

Prime Computer, Inc., 40 Walnut St., Wellesley Hills, Massachusetts 02181. Telephone (617) 237-6990.

Programmed Control Corporation, 2 East Broad Street, Hopewell, New Jersey 08525. Telephone (609) 466-2100.

Qantel Corporation, 3525 Breakwater Avenue, Hayward, California 94545. Telephone (415) 783-3410.

QI Corporation, 6 Dubon Court, Farmingdale, New York 11735. Telephone (516) 293-0700.

Randal Data Systems, Inc., 365 Maple Avenue, Torrance, California 90503. Telephone (213) 320-8550.

Raytheon Data Systems Company, 1415 Boston-Providence Turnpike, Norwood, Massachusetts 02062. Telephone (617) 762-6700.

Shasta General Systems, 895 Stanton Road, Burlingame, California 94010. Telephone (415) 692-0722.

STC Systems, Inc., E-210 Route 4, Paramus, New Jersey 07652. Telephone (201) 843-0560.

A. O. Smith Corp., Data Systems Division, P.O. Box 584, Milwaukee, Wisconsin 53201. Telephone (414) 447-4472.

Span Management Systems, Westminster Industrial Park, East Providence, Rhode Island 02914. Telephone (401) 438-2200.

Sperry Univac Division, Sperry Rand Corporation, P.O. Box 500, Blue Bell, Pennsylvania 19422. Telephone (215) 542-4011.

Sycor, Inc., 100 Phoenix Drive, Ann Arbor, Michigan 48104. Telephone (313) 995-1264.

Tal-Star Computer Systems, Inc., P.O. Box T-1000, Princeton Junction, New Jersey 08550. Telephone (609) 799-1111.

Tealtronic of America Inc., 14 Commerce Drive, Cranford, New Jersey 07016. Telephone (201) 272-2922.

Terak Corporation, 14425 N. Scottsdale Rd., Suite 100, Scottsdale, Arizona 85260. Telephone (602) 991-1580.

Vanguard Computer Systems, Inc., 7417 Van Nuys Boulevard, Van Nuys, California 91405. Telephone (213) 994-7343.

Wang Laboratories, Inc., 836 North Street, Tewksbury, Massachusetts 08176. Telephone (617) 851-4111.

Warrex Computer Corporation, P.O. Box 943, Richardson, Texas 75080. Telephone (214) 238-7238.

Wintex Computer Corporation, 544 Lunt Avenue, Schaumburg, Illinois 60172. Telephone (312) 529-2080.□

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MANUFACTURER & MODEL	Advanced Information Design System 3000 Model 40	Advanced Information Design System 3000 Model 60	Advanced Information Design System 3000 Model 80	Advanced Information Design System 4000	A.K. Industries Inc. AKI-90
DATA FORMATS					
Word length, bits	16	16	16	32	8-bit byte
Decimal digits per word	4	4	4	7	2 per byte
Bytes (characters) per word	2	2	2	4	1 per byte
Operand length, words	½ to 2	½ to 2	½ to 2	½ to 2	1, 2 bytes
Instruction length, words	1, 2	1, 2	1, 2	1	1-3 bytes
CPU					
Model	Interdata 7/16	Interdata 7/16	Interdata 7/16	Interdata 7/32, 8/32	Datapoint
Add time, microseconds	1.5	1.5	1.5	0.6	—
No. of programmable registers	16	16	16	32	14
No. of I/O ports on basic system and maximum	64; 256	64, 256	64; 256	128; 1024	16
INTERNAL STORAGE					
Type	Core	Core	Core	Core	MOS
Capacity of basic system, bytes	32K	32K	32K	128K	16K
Maximum capacity, bytes	64K	64K	64K	1M	16K
Increment size, bytes	16, 32, 64K	16, 32, 64K	16, 32, 64K	32K	—
Cycle time, microseconds	1.000	1.000	1.000	0.750; 0.300	1.6
Access time, microseconds	0.300	0.300	0.300	0.300	0.5
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Std.; 2.4M bytes	Opt.; 2.4M bytes	Opt.; 2.4M bytes	Opt.; 2.4M bytes	Standard (4)
Cartridge disk drive	Opt.; 40M bytes	Std.; 40M bytes	Opt.; 40M bytes	Opt.; 40M bytes	No
Pack disk drive	Opt.; 1200M bytes	Opt.; 1200M bytes	Std.; 1200M bytes	Std.; 300M bytes	No
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	Standard	Standard	Standard
Full accounting keyboard	Optional	Optional	Optional	Optional	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 300 cps	Opt.; 300 cps	Opt.; 300 cps	Opt.; 300 cps	No
Paper tape punch	Opt.; 75 cps	Opt.; 75 cps	Opt.; 75 cps	Opt.; 75 cps	No
Punched card reader	Opt.; 400-1000 cpm	Opt.; 400-1000 cpm	Opt.; 400-1000 cpm	Opt.; 400-1000 cpm	No
Punched card punch	Opt.; 100 cpm	Opt.; 100 cpm	Opt.; 100 cpm	Opt.; 100 cpm	No
Punched card reader/punch	Optional	Optional	Optional	Optional	No
Serial printer	Std.; 165 cps	Std.; 165 cps	Std.; 165 cps	Std.; 165 cps	Std.; 165 cps
Line printer	Opt.; 120-600 lpm	Opt.; 120-600 lpm	Opt.; 120-600 lpm	Opt.; 120-600 lpm	.Opt.; 125-600 lpm
Reel-to-reel tape drive	Std.; 9-75 KBS	Std.; 9-75 KBS	Std.; 9-75 KBS	Std.; 9-72 KBS	No
Cassette tape drive	Optional	Optional	Optional	Optional	No
Cartridge tape drive	Optional	Optional	Optional	Optional	No
Magnetic ledger card device	Optional	Optional	Optional	Optional	No
CRT	Optional; 24 x 80 char.	Optional; 24 x 80 char.	Optional; 24 x 80 char.	Optional; 24 x 80 char.	Standard; 12 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	15	15	15	Limit unknown	1
Synchronous	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Std.; to 9600 bps	Opt.; to 9600 bps
Asynchronous	Std.; to 9600 bps	Std.; to 9600 bps	Std.; to 9600 bps	Std.; to 9600 bps	Opt.; to 9600 bps
Protocols supported	IBM 2780/3780, SDLC	IBM 2780/3780, SDLC	IBM 2780/3780, SDLC	IBM 2780/3780, SDLC	IBM 2780
SOFTWARE SUPPORT					
COBOL	Yes	Yes	Yes	Yes	No
RPG	Yes	Yes	Yes	Yes	No
FORTRAN	Yes	Yes	Yes	Yes	No
BASIC	Yes	Yes	Yes	Yes	Yes
Assembler	Macro assembler	Macro assembler	Macro assembler	Macro assembler	Yes
Other programming languages	No	No	No	No	Databus, Dataform
Multiprogramming	Yes; 5 partitions	Yes; 5 partitions	Yes; 5 partitions	Yes; 12 partitions	No
Language implemented in firmware	No	No	No	No	No
Operating system implemented in firmware	No	No	No	No	No
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Insur., inven., dist., ord. entry, wd. proc.	Insur., inven., dist., ord. entry, wd. proc.	Insur., inven., dist., ord. entry, wd. proc.	Insur., inven., dist., ord. entry, wd. proc.	Inventory
Data base management system	Yes	No	No	No	No
File access methods supported	Random, sequential, index sequential	Random, sequential, index sequential	Random, sequential, index sequential	Random, sequential, index sequential	Random, sequential, index sequential
Software separately priced	Yes	Yes	Yes	Yes	No
Technical help separately priced	No	No	No	No	No
PRICING & AVAILABILITY					
Purchase price of basic system, $	$18,528	$26,430	$43,700	$66,750	$25,000
Monthly rental of basic system, $	$426.14	$607.89	$1,005.10	$1,535.25	$550
Date of first U.S. delivery	March 1975	March 1975	March 1975	October 1976	November 1974
Number installed in U.S. to date	20	20	20	NA	10
COMMENTS	System price includes terminal, 32KB, 1.2MB of floppy disk storage; swapping available	System price includes terminal, 32KB, 10MB of removable disk storage; swapping available	System price includes terminal, 32KB, 100MB of removable disk storage; swapping available	System price includes terminal, 96KB, 100MB of removable disk storage; swapping available	Turnkey system; does not require data processing professional for operation

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	A.K. Industries Inc. AKI-91	Anderson Jacobson 1500	Applied Data Communications Series 70	Applied Data Processing Inc. Resource/100	Applied Digital Communications 101
DATA FORMATS					
Word length, bits	8-bit byte	8-bit byte	8-bit byte	16	8-bit byte
Decimal digits per word	2 per byte	1 per byte	1 per byte	2	1 per byte
Bytes (characters) per word	1 per byte	1 per byte	1 per byte	2	1 per byte
Operand length, words	1, 2 bytes	1, 2 bytes	1 byte	Variable	1 byte
Instruction length, words	1-3 bytes	1-3 bytes	1-3 bytes	1	1 byte
CPU					
Model	8080A	AJ 1500	Intel 8080	DG Nova	Wang 2200
Add time, microseconds	—	4.0 (1 word)	2 (1 byte)	1.35 (1 word)	800 (13 digits)
No. of programmable registers	7	128	7	4	None
No. of I/O ports on basic system and maximum	256	3; 11	1; 256	8; 16	4
INTERNAL STORAGE					
Type	MOS	Core/MOS	MOS	Core	MOS
Capacity of basic system, bytes	32K	32K	16K	64K	8K
Maximum capacity, bytes	64K	65K	65K	212K	32K
Increment size, bytes	4K	32K	16K	32K	8K
Cycle time, microseconds	0.5	1.2	2	1.0	1.6
Access time, microseconds	0.45	0.6	—	0.5	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	Std.; 653K bytes	Std.; 256K bytes	No	Standard
Cartridge disk drive	No	Opt.; 40M bytes	Opt.; 10M bytes	No	Std.. 10M bytes
Pack disk drive	Std.; 80M bytes	No	No	Std.; 320M bytes	--
Fixed-head disk/drum	No	No	Opt., 2.5M bytes	No	--
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Std.; any RS-232	Standard	Standard
10-key numeric keyboard	Standard	Standard	Optional	Optional	Standard
Full accounting keyboard	No	No	Optional	Yes	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	No	Opt.; 300 cps	Optional	Optional
Paper tape punch	No	No	Opt.; 75 cps	Optional	Optional
Punched card reader	No	No	No	Optional	Optional
Punched card punch	No	No	No	Optional	Optional
Punched card reader/punch	No	No	No	Optional	Optional
Serial printer	Std.; 165 cps	Std.; 45, 120 cps	Opt.; to 165 cps	Std.; 165, 330 cps	No
Line printer	Opt.; 125-600 lpm	Opt.; 300 lpm	Opt.; to 1400 lpm	Opt.; 300, 600 lpm	Std. 125 lpm
Reel-to-reel tape drive	No	No	Opt.; to 120 KBS	Optional	Optional
Cassette tape drive	No	No	No	No	No
Cartridge tape drive	No	No	Optional	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Standard; 24 x 80 char.	Optional; 24 x 80 char.	Std.; 24 x 80 char	Standard; 27 x 74 char.	Std., 1024-1920 char
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	8	9	2	7	No
Synchronous	Opt.; to 9600 bps	No	Opt.; to 9600 bps	No	No
Asynchronous	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Std., 1200 bps	No
Protocols supported	IBM 2780	None	Bisync	IBM 2780	No
SOFTWARE SUPPORT					
COBOL	No	No	No	No	No
RPG	No	No	No	No	No
FORTRAN	No	No	No	No	No
BASIC	Yes	Yes	Yes	Yes	Yes
Assembler	Yes	Yes	Yes	Yes	No
Other programming languages	None	ESP	None	Extended BASIC	No
Multiprogramming	Yes; 2 partitions	Yes; 8 partitions	Yes	Yes	Yes
Language implemented in firmware	Partially	Partially	No	No	No
Operating system implemented in firmware	Partially	Partially	Partially	No	No
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Inventory	CPA's, public accountants	—	Yes	Medicine Mfg.
Data base management system	No	No	No	Yes	No
File access methods supported	Random, sequential, index sequential	Sequential, direct access	Random, sequential, index sequential	Random, sequential, index sequential	Random, index seq., sequential
Software separately priced	No	Yes	Yes	Yes	Yes
Technical help separately priced	No	Yes	Yes	Yes	Yes.
PRICING & AVAILABILITY					
Purchase price of basic system, $	$30,000	$19,990	$8,285	$39,300	$30,000
Monthly rental of basic system, $	$600	Contact vendor	—	$865	—
Date of first U.S. delivery	August 1976	April 1977	May 1975	June 1976	1977
Number installed in U.S. to date	1	NA	100 +	NA	—
COMMENTS	Turnkey system; does not require data processing professional for operation	Two-diskette system; also available with four diskettes; up to 10M bytes	Expandable to 8 double-density floppies or 4 10 MB disk drives; time-shared multi-user operating system for up to 4 CRT's	Resource/100 Extended Operating Systems are said to meet 95% of most users' needs for business applications	Drug inventory control, patient profile, payroll, text editing

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Applied Digital Communications 201	Applied Digital Communications 301	Applied Digital Technology	Applied Systems Corp. ASC 80	Applied Systems Corp. ASC 1800
DATA FORMATS					
Word length, bits	16	16	16	8, 16	8-bit byte
Decimal digits per word	2	2	2	1, 2	2 per byte
Bytes (characters) per word	2	2	2	1	1 per byte
Operand length, words	1	1	½, 1	1, 2	1 byte
Instruction length, words	1	1, 2	1, 2	1, 2, 3	1-3 bytes
CPU				Intel 8080/85;	
Model	Varian V77	HP 2100	GA SPC-16/45, /65	Opt. 780	Intel 8080
Add time, microseconds	2.32 (1 word)	1.96	0.96; 1.4 (word)	2 per digit	2 (1 byte)
No. of programmable registers	8	5	8	7	16
No. of I/O ports on basic system and maximum	8	4	2	4 to 64	2; 256
INTERNAL STORAGE					
Type	MOS	MOS	Core	MOS	MOS
Capacity of basic system, bytes	8K	8K	4K	4 to 64K	4K
Maximum capacity, bytes	32K	32K	64K	64K plus	64K
Increment size, bytes	8K	4K	4K, 8K	4K	4K
Cycle time, microseconds	0.66	0.65	0.96; 1.4	0.5	0.5
Access time, microseconds	0.37	0.40	—	0.5	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Optional	Optional	Opt.; 147K bytes	Opt.; 90K/250K	Opt.; 500K bytes
Cartridge disk drive	—	—	Std.; 10M bytes	Opt.; RPQ	Opt.; 250K bytes
Pack disk drive	—	—	Opt.; 100M bytes	Opt.; RPQ	RPQ
Fixed-head disk/drum	—	—	Opt.; 256K bytes	Opt.; 7M bytes	RPQ
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Optional	Standard
10-key numeric keyboard	Standard	Standard	Standard	Optional	Optional
Full accounting keyboard	No	No	No	Optional	Optional
INPUT/OUTPUT DEVICES*					
Paper tape reader	Optional	Optional	Opt.; 300, 400 cps	Opt.; 300,	Opt.; 20-300 cps
Paper tape punch	Optional	Optional	Opt.; 75 cps	Opt.; 100 cps	Opt.; 10-50 cps
Punched card reader	Optional	Optional	Opt.; 300-1000 cpm	Opt.; RFQ	Opt.; 200 cpm
Punched card punch	Optional	Optional	Opt.; 35 cpm	Opt.; RFQ	Opt.; 100 cpm
Punched card reader/punch	Optional	Optional	No	No	Opt.; RPQ
Serial printer	No	No	Std.; 165 cps	Opt.; to 30 cps	Std.; 30 cps
Line printer	No	No	Opt.; 200-600 lpm	Opt.; 100/300	Opt.; 100-600 lpm
Reel-to-reel tape drive	Optional	Optional	Std.; 7.5-60 KBS	Opt.; RFQ	Opt.; RPQ
Cassette tape drive	No	No	No	Opt.; 100	Opt.; RPQ
Cartridge tape drive	No	No	No	Opt.; 400	Opt.; RPQ
Magnetic ledger card device	No	No	No	No	Opt.; RPQ
CRT	Std.; 1920 char.	Std.; 1920 char.	Standard; 8 x 64, 27 x 74 char.	Opt.; to 80 x 24/ graphic	Opt.; 20 x 40 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	No	No	4	16, 32	16
Synchronous	No	No	Std.; to 9600 bps	Opt.; to 50K	Opt.; to 9600 bps
Asynchronous	No	No	Std.; to 9600 bps	Opt.; to 9600K	Opt.; to 9600 bps
Protocols supported	No	No	None	IBM—Bisync; DECnet (RPQ)	Bisync, other error correct. protocols
SOFTWARE SUPPORT					
COBOL	No	No	Yes	No	No
RPG	Yes	Yes	Yes	No	No
FORTRAN	Yes	Yes	Yes	Optional	No
BASIC	Yes	Yes	No	Yes	Yes
Assembler	Yes	Yes	Yes	Yes	Yes
Other programming languages	No	ALGOL	None	PL/M optional	PL/M
Multiprogramming	Yes	Yes	Yes	Optional	—
Language implemented in firmware	No	No	No	Optional	Partially
Operating system implemented in firmware	No	No	No	Optional	Fully
General accounting packages	No	No	Yes	Yes	Yes; custom
Industry application areas	Process control	Mfg. mgmt., acctg., data logging	Property mgmt., accounting	Communications, graphics, d.p.	Communications
Data base management system	Yes	Yes	No		No
File access methods supported	Random, index sequential	Random, index sequential	Direct, sequential, index sequential	Sequential, random	Sequential, random
Software separately priced	Yes	Yes	Yes	Yes	Yes
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$40,000	$40,000	$50,000-$100,000	$1,500	$5,000
Monthly rental of basic system, $	—	—	Purchase only	$75	$250
Date of first U.S. delivery	1976	1977	January 1972	1975	1974
Number installed in U.S. to date	—	—	10	NA	NA
COMMENTS	Computer-generated image systems, process control systems	Data base management	Marketed in Chicago area only	Basic computer system for business and data communications with modular expansion and peripheral options	Oriented toward local and satellite processing with communications support or custom applications

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	J. Baker & Associates Distribution System 11/03	J. Baker & Associates Distribution System	J. Baker & Associates Distribution System 2	Basic Four Corporation Model 350	Basic Four Corporation Model 400
DATA FORMATS					
Word length, bits	16	16	16	8-bit byte	8-bit byte
Decimal digits per word	2	2	2	1 per byte	1 per byte
Bytes (characters) per word	2	2	2	1 per byte	1 per byte
Operand length, words	1	1	1	—	—
Instruction length, words	1-3	1-3	1-3	2 bytes	2 bytes
CPU					
Model	DEC PDP-11/03	DEC PDP-11/34	DEC PDP-11/70	BFC 1320	BFC 1320
Add time, microseconds	7.7 (1 word)	4.9 (1 word)	1.8 (1 word)	7.4	7.4
No. of programmable registers	8	8	8	3	3
No. of I/O ports on basic system and maximum	3; 16	3; 32	3; 64	11 (above req.)	11 (above req.)
INTERNAL STORAGE					
Type	MOS	MOS, core	MOS, core	MOS	MOS
Capacity of basic system, bytes	32K	128K	128K	24K	24K
Maximum capacity, bytes	56K	256K	4M	64K	64K
Increment size, bytes	8K	32K	32K	8K, 16K	8K, 16K
Cycle time, microseconds	—	0.51	0.41	0.6	0.6
Access time, microseconds	—	1.00	0.99	0.4	0.4
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Opt., 1024K bytes	Opt., 512K bytes	Opt.; 512K bytes	No	No
Cartridge disk drive	Std., 4.8M bytes	Std.; 14M bytes	Std.; 88M bytes	Std.; M bytes	Std.; 20M bytes
Pack disk drive	No	No	Opt.; 176M bytes	No	No
Fixed-head disk/drum	No	Opt.; 2M bytes	Opt.; 2M bytes	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	Standard	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	Opt.; 300 cps	Opt.; 300 cps	Opt.; 300 cps	Opt.; 300 cps
Paper tape punch	No	Opt.; 50 cps	Opt.; 50 cps	Opt.; 75 cps	Opt.; 75 cps
Punched card reader	No	Opt.; 1200 cpm	Opt.; 1200 cpm	Opt.; 300-400 cpm	Opt.; 300-400 cpm
Punched card punch	No	No	No	No	No
Punched card reader/punch	No	Opt.; 285 cpm	Opt.; 285 cpm	No	No
Serial printer	Std.; 180 cps	Opt.; 30 cps	Opt.; 30 cps	Std.; 165 cps	Std.; 165 cps
Line printer	Std.; 230, 300 lpm	Opt.; 230, 300 lpm	Opt.; 300, 900 lpm	Opt.; 300, 600 lpm	Opt.; 150-600 lpm
Reel-to-reel tape drive	No	Opt.; 9 KBS	Opt.; 9 KBS	Opt.; 10 KBS	Opt.; 10 KBS
Cassette tape drive	No	Opt.; 562 cps	Opt.; 562 cps	No	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Optional, 24 x 80 char.	Optional, 24 x 80 char.	Optional, 24 x 80 char.	Std.; 24 x 80, 16 x 32 char.	Std.; 24 x 80, 16 x 32 char
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	3	32	64	8	8
Synchronous	Opt.; 9600 bps	Opt.; 9600 bps	Opt.; 9600 bps	No	No
Asynchronous	Opt.; 9600 bps	Opt.; 9600 bps	Opt.; 9600 bps	Std.; 9600 bps	Std.; 9600 bps
Protocols supported	IBM 2780	IBM 2780	IBM 2780	None	None
SOFTWARE SUPPORT					
COBOL	No	Yes	Yes	No	No
RPG	No	Yes	Yes	No	No
FORTRAN	Yes	Yes	Yes	No	No
BASIC	Yes	Yes	Yes	Yes	Yes
Assembler	Yes	Yes	Yes	No	No
Other programming languages	DIBOL (COBOL)	DIBOL (COBOL)	DIBOL (COBOL)	None	—
Multiprogramming	Yes	Yes; 4 partitions	Yes; 4 partitions	Yes; 8 partitions	Yes; 8 partitions
Language implemented in firmware	Partially	Partially	Partially	No	No
Operating system implemented in firmware	No	No	No	Partially	Partially
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Manufacturing, distribution	Manufacturing, distribution	Manufacturing, distribution	Medical, insurance, general business	Medical, insurance, general business
Data base management system	No	Yes	Yes	No	No
File access methods supported	Sequential, random, index seq.	Sequential, random, index seq.	Sequential, random, index seq.	Sequential, random	Sequential, random
Software separately priced	Yes	Yes	Yes	Yes	Yes
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$34,995	$45,000	$70,000	$34,400	$36,900
Monthly rental of basic system, $	Contact vendor	Contact vendor	Contact vendor	$757	$812
Date of first U.S. delivery	May 1977	September 1975	September 1975	1971	1971
Number installed in U.S. to date	5	25	NA	4000 (all models)	4000 (all models)
COMMENTS		Software costs $7K to $9.5K for plumbing, soft drinks, auto parts, or hardware distribution; full manufacturing system also available	See Distribution System comments; developed with major brewery	Available as packaged systems only; system price also includes cartridge disk subsystem, serial or line printer, and CRT terminal	Available as packaged systems only; system price also includes cartridge disk subsystem, serial or line printer, and CRT terminal

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Basic Four Corporation Model 600	Basic Four Corporation Model 700	Basic Timesharing 4000/15	Basic Timesharing 4000/25	Binary Data Systems UCOM I
DATA FORMATS					
Word length, bits	8-bit byte	8-bit byte	16	16	16
Decimal digits per word	1 per byte	1 per byte	2	2	2, 4
Bytes (characters) per word	1 per byte	1 per byte	2	2	2
Operand length, words	—	—	1	1	1, 2
Instruction length, words	2 bytes	2 bytes	1	1	1
CPU					
Model	BFC 1320	BFC 1320	BTI 4020	BTI 4020	DG Nova 3
Add time, microseconds	7.4	7.4	20	20	10 (1 word)
No. of programmable registers	3	3	2	2	5
No. of I/O ports on basic system and maximum	11 (above req)	9 (above req.)	11	11	3, 10
INTERNAL STORAGE					
Type	MOS	MOS	MOS	MOS	Core
Capacity of basic system, bytes	32K	64K	64K	64K	64K
Maximum capacity, bytes	64K	128K	64K	64K	256K
Increment size, bytes	8K, 16K	8K, 16K	None	None	32K
Cycle time, microseconds	0.6	0.6	0.65	0.65	0.8
Access time, microseconds	0.4	0.4	0.3	0.3	0.4
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	No	No	Optional
Cartridge disk drive	Std., 40M bytes	No	Std.; 40M bytes	Opt.; 40M bytes	Std.; 40M bytes
Pack disk drive	No	Std.; 300M bytes	Opt.; 389M bytes	Std.; 389M bytes	Opt.; 800M bytes
Fixed-head disk/drum	No	No	No	No	Optional
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	No	No	Standard
10-key numeric keyboard	Standard	Standard	No	No	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 300 cps	No	No	No	Opt.; 400 cps
Paper tape punch	Opt.; 75 cps	No	No	No	Opt.; 75
Punched card reader	Opt.; 300-400 cpm	No	No	No	Opt.; 1000 cpm
Punched card punch	No	No	No	No	Opt.; 150 cpm
Punched card reader/punch	No	No	No	No	No
Serial printer	Std.; 165 cps	Opt.; 165 cps	No	No	Opt.; 165 cps
Line printer	Opt.; 300, 600 lpm	Std.; 300 lpm	Opt.; 300-900 lpm	Opt.; 300-900 lpm	Std.; 200-1500 lpm
Reel-to-reel tape drive	Opt.; 10 KBS	Opt.; 10 KBS	Opt.; to 72 KBS	Opt.; to 72 KBS	Opt.; 10-72 KBS
Cassette tape drive	No	No	No	No	Opt.; 1.6 KBS
Cartridge tape drive	No	No	Std.; 192 KBS	Std.; 192 KBS	No
Magnetic ledger card device	No	No	No	No	No
CRT	Std.; 24 x 80, 16 x 32 char.	Std.; 24 x 80, 16 x 32 char.	No	No	Std.; 1920 cps
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	8	—	4	4	256
Synchronous	Opt.; 2400 bps	Opt.; 2400 bps	No	No	Opt.; to 48K bps
Asynchronous	Std.; 9600 bps	Std.; 9600 bps	Opt.; 2500 bps	Opt.; 2500 bps	Opt.; to 9600 bps
Protocols supported	IBM 2780	IBM 2780	User-programmable	User-programmable	IBM 2780/3780 SDLC
SOFTWARE SUPPORT					
COBOL	No	No	No	No	Yes
RPG	No	No	No	No	No
FORTRAN	No	No	No	No	Yes
BASIC	Yes	Yes	Yes	Yes	Yes
Assembler	No	No	No	No	Yes
Other programming languages	—	—	No	No	—
Multiprogramming	Yes; 8 partitions	Yes; 16 partitions	No	No	Yes; 64 partitions
Language implemented in firmware	No	No	Partially	Partially	No
Operating system implemented in firmware	Partially	Partially	Partially	Partially	No
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Medical, insurance, general business	Medical, insurance, general business	School administration	School administration	Whlsl./dist., real estate, medical
Data base management system	No	No	Yes	Yes	Yes
File access methods supported	Sequential, random	Sequential, random	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, ISAM
Software separately priced	Yes	Yes	Yes	Yes	No
Technical help separately priced	Yes	Yes	No	No	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$51,400	$115,000	$35,950	$56,300	$45,000
Monthly rental of basic system, $	$1131	$2530	No	—	—
Date of first U.S. delivery	1975	1976	January 1976	January 1976	July 1973
Number installed in U.S. to date	4000 (all models)	4000 (all models)	NA	NA	NA
COMMENTS	Available as packaged systems only; system price also includes cartridge disk subsystem, serial or line printer; and CRT terminal	600-lpm printer available as an option; available only as packaged system including pack disk, line printer, and CRT	Up to 32 user terminals concurrently, or 24 + 4 comm. lines; 10M-byte non-removable disk drive std	Up to 32 user terminals concurrently, or 24 + 4 comm. lines; 49M-byte pack drive std.	

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Binary Data Systems UCOM II	Binary Data Systems UCOM III	Burroughs B 80	Burroughs B 730/B 720	Burroughs B 801
DATA FORMATS					
Word length, bits	16	16	8	64	64
Decimal digits per word	2, 4	2, 4	2	15	16
Bytes (characters) per word	2	2	1	8	8
Operand length, words	1, 2	1, 2	Variable	Variable	1
Instruction length, words	1	1	Variable	Variable	2, 3, 4, 5 bytes
CPU					
Model	DG Dual Nova 3/D	DG Eclipse C330	B 80/30/40/50	Burroughs B 731	Burroughs B 800
Add time, microseconds	10 (1 word)	6 (5 digits)	—	430	—
No. of programmable registers	5	8	None	4	20
No. of I/O ports on basic system and maximum	3, 10	64	8, 11	6, 8	7
INTERNAL STORAGE					
Type	Core	Core	MOS	MOS	MOS
Capacity of basic system, bytes	128K each	256K	32K/60K	32K	32K
Maximum capacity, bytes	256K each	512K	60K/124K	80K	80K
Increment size, bytes	32K	32K	4K/16K	8K	8K
Cycle time, microseconds	0.8	0.8	1.0	1.0	1.0
Access time, microseconds	0.4	0.4	0.5	0 5	0.5
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Optional	Optional	Opt.; 6M bytes	Opt., 243K bytes	Opt.; 486K bytes
Cartridge disk drive	Std., 40M bytes	Std.; 40M bytes	Opt.; 27.6M bytes	Opt.; 36.8M bytes	Opt.; 36.8M bytes
Pack disk drive	Opt.; 800M bytes	Opt.; 800M bytes	No	No	No
Fixed-head disk/drum	Optional	Optional	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	Standard	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 400 cps	Opt., 400 cps	No	Opt., 40 cps	No
Paper tape punch	Opt., 75 cps	Opt.; 75 cps	No	Opt., 40 cps	No
Punched card reader	Opt.; 1000 cpm	Opt., 1000 cpm	No	Opt., 600 cpm	Opt., 300 cpm
Punched card punch	Opt., 150 cpm	Opt., 150 cpm	No	No	No
Punched card reader/punch	No	No	No	Opt.; 600/60 cpm	Opt.; 300/60,200/45
Serial printer	Opt.; 165 cps	Opt.; 165 cps	Std., 60, 180 cps	Std.; 60 cps	Std. 120 cps
Line printer	Std.; 200-1500 lpm	Std.; 200-1500 lpm	Opt., 160, 250 lpm	Opt.; 85-400 lpm	Opt., 85-400 lpm
Reel-to-reel tape drive	Opt., 10-72 KBS	Opt.; 10-72 KBS	No	Opt.; 10 KBS	Opt.; 10 KBS
Cassette tape drive	Opt.; 1.6 KBS	Opt.; 1.6 KBS	Std.; 1 KBS	Opt.; 1 KBS	Opt.; 1 KBS
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Std.; 1920 cps	Std.; 1920 cps	Standard; 8 x 32 char.	Optional; 24 x 80, 12x40, 8x32 char.	Opt.; 256-1920 char
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	256	256	4	1	4
Synchronous	Opt.; to 48K bps	Opt.; to 48K bps	Opt.; to 4800 bps	Opt., to 9600 bps	Opt.; to 9600 bps
Asynchronous	Opt., to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Protocols supported	IBM 2780/3780 SDLC	IBM 2780/3780 SDLC	Basic mode, bisync., BDLC	Basic mode, bisync., 3780, BDLC	Basic mode, bisync., 3780
SOFTWARE SUPPORT					
COBOL	Yes	Yes	Yes	Yes	Yes
RPG	No	No	Yes	Yes	Yes
FORTRAN	Yes	Yes	No	No	No
BASIC	Yes	Yes	No	No	No
Assembler	Yes	Yes	No	No	No
Other programming languages	—	—	DSC/MPL/NDL	AEL	AEL, MPL, NDL
Multiprogramming	Yes, 64 partitions	Yes; 2 partitions	Yes; to 3 programs	Yes; see comments	Yes
Language implemented in firmware	No	No	Fully	Fully	Fully
Operating system implemented in firmware	No	No	Fully	Fully	Fully
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Basic accounting	Basic accounting	Whlsl., dist., med., financial	All business	All business acct'g applications
Data base management system	Yes	Yes	No	No	No
File access methods supported	Random, sequential, ISAM	Random, sequential ISAM	Random, sequential, index seq.	Sequential	Random, indexed seq., index random
Software separately priced	No	No	Yes	Yes	Yes
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$95,000	$130,000	$22,010 w/MCP	$30,400	$32,400
Monthly rental of basic system, $	—	—	$720 with MCP	$968	$880
Date of first U.S. delivery	May 1975	March 1976	April 1976	May 1973	April 1977
Number installed in U.S. to date	NA	NA	NA	NA	—
COMMENTS	Dual processor featuring completely redundant systems			AEL programs can execute concurrently w./RPG or COBOL programs, B 730 supports up to 4 Direct Data Entry stations	

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Burroughs B 810/B 820	Burroughs B 1830 Series	Burroughs B 1860 Series	Burroughs B 1870 Series	Business Controls System 80/8
DATA FORMATS					
Word length, bits	64	16	16	16	12
Decimal digits per word	16	4	4	4	4
Bytes (characters) per word	8	2	2	2	2
Operand length, words	1	Variable	Variable	Variable	1
Instruction length, words	2, 3, 4, 5 bytes	Variable	Variable	Variable	1
CPU					
Model	Burroughs B 800	Burroughs B 1830	Burroughs B 1860	Burroughs B 1870	DEC PDP-8/A, E
Add time, microseconds	—	—	—	—	2 6-3 0 (word)
No. of programmable registers	20	—	—	—	8
No. of I/O ports on basic system and maximum	7	1, 14	1, 14	1, 14	2, 12
INTERNAL STORAGE					
Type	MOS	MOS/LSI	MOS/LSI	MOS/LSI	Core
Capacity of basic system, bytes	64K	48K	64K	96K	32K
Maximum capacity, bytes	131K	256K	384K	512K	256K
Increment size, bytes	8K	16K, 32K, 64K	32K, 64K, 128K	32K, 128K	16K
Cycle time, microseconds	1.0	1.2	0.333	0.333	1 2
Access time, microseconds	0.5	0.4	0.167	0.167	0 6
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Opt.; 2 million	Opt.; 486K bytes	Opt.; 486K bytes	Opt., 486K bytes	Opt.; 670K bytes
Cartridge disk drive	Opt.; 368 million	Std.; 74.4M bytes	Opt.; 74.4K bytes	Opt.; 74.4K bytes	Std.; 25.6M bytes
Pack disk drive	Opt.; 521 million	Opt.; 697.6M bytes	Std.; 697.6M bytes	Std.; 697.6M bytes	No
Fixed-head disk/drum	No	No	No	Std.; 18M bytes	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	No	No	No	Optional
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	No	No	No	Opt.; 300 cps
Paper tape punch	No	No	No	No	Opt., 50 cps
Punched card reader	Opt.; 300 cpm	Std.; 300 cpm	Std.; 600 cpm	Std.; 1400 cpm	Opt.; 200 cpm
Punched card punch	No	Opt.; 150, 300 cpm	Opt.; 150, 300 cpm	Std.; 300 cpm	No
Punched card reader/punch	Opt.;300/60,200/45	Opt.;200/45,300/60	Opt.;200/45,300/60	Opt.;200/45,300/ 60	No
Serial printer	Opt.; 120 cps	No	No	No	Std.; 180 cps
Line printer	Opt.; 85-750 lpm	Std.; 400 lpm	Std.; 750 lpm	Std.; 1500 lpm	Opt.; 250-600 lpm
Reel-to-reel tape drive	Opt.; 10 KBS	Opt.; 10-120 KBS	Opt.; 10-120 KBS	Std., 80 KBS (4)	Opt.; 36 KBS
Cassette tape drive	Opt.; 1 KBS	Opt.; 1 KBS	Opt.; 1 KBS	Opt.; 1 KBS	Opt.; 3 KBS
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Opt.; 256-1920 char.	Std.; 24 x 80 char.	Std.; 24 x 80 char.	Std.; 24 x 80 char	Std.; 12 x 80 char.; Opt.; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	4	4	32	8 Std.; 24 opt.	16
Synchronous	Opt.; to 9600 bps	Opt.; 50,000 bps	Opt.; 50,000 bps	Opt.; 50,000 bps	Opt.; to 4800 bps
Asynchronous	Opt.; to 9600 bps	Opt.; 9600 bps	Opt.; 9600 bps	Opt.; 9600 bps	Opt.; to 9600 bps
Protocols supported	Basic mode, bisync, 360/20 HASP	Basic mode, bisync, BDLC	Basic mode, bisync, BDLC	Basic mode, bisync, BDLC	IBM 2780
SOFTWARE SUPPORT					
COBOL	Yes	Yes	Yes	Yes	No
RPG	Yes	Yes	Yes	Yes	No
FORTRAN	No	Yes	Yes	Yes	Yes
BASIC	No	Yes	Yes	Yes	Yes
Assembler	No	No	No	No	Yes
Other programming languages	AEL, MPL, NDL	NDL, UPL, AEL	NDL, UPL, AEL	NDL, UPL, AEL	DIBOL, COM
Multiprogramming	Yes	Yes	Yes	Yes	Yes, 15 partitions
Language implemented in firmware	Fully	Fully	Fully	Fully	No
Operating system implemented in firmware	Fully	Fully	Fully	Fully	No
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	All business acc'tg. applications	All business acct'g applications	All business acct'g applications	All business acct'g applications	Retail, mfg., dist., whlsl., list maint.
Data base management system	No	Yes	Yes	Yes	No
File access methods supported	Random, indexed seq., index random	Random, index seq., index random	Random, index seq., index random	Random, index seq index random	Random, sequential, indexed sequential
Software separately priced	Yes	Yes	Yes	Yes	No
Technical help separately priced	Yes	Yes	Yes	Yes	No
PRICING & AVAILABILITY					
Purchase price of basic system, $	$35,900	$115,590 (98KB)	$194,760 (160KB)	$470,935 (384KB)	$29,990
Monthly rental of basic system, $	$975	$3,058 (5-yr. lease)	$4,815 (5-yr. lease)	$11,671 (5-yr. lease)	$600
Date of first U.S. delivery	April 1977	2nd quarter 1977	2nd quarter 1977	2nd quarter 1977	1971
Number installed in U.S. to date	—	NA	NA	NA	100
COMMENTS		300-1400 cpm card readers opt.; 85-1500 lpm line printers opt.; see Report 70C-112-05 for more details	300-1400 cpm card readers opt.; 85-1500 lpm line printers opt.; see Report 70C-112-05 for more details	150 cpm card punch, 300-1400 cpm card readers, 85-1500 lpm line printers, 10-120KB mag tapes opt.; see Report 70C-112-05 for more details	

*"Std." means the device is included in the price of the basic system" as listed here.

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MANUFACTURER & MODEL	Business Controls System 80/11	Business Systems Products Adviser II	Business Systems Products Adviser III	Cado Systems Corporation System 40	Cascade Data, Inc. Concept II
DATA FORMATS					
Word length, bits	16	16 bits	16 bits	8-bit byte	16
Decimal digits per word	5	2	2	2 per byte	2
Bytes (characters) per word	2+	2	2	1 per byte	2
Operand length, words	½, 1, 2	2	2	0-4	1-256 bytes
Instruction length, words	1	1, 2, 3	1, 2, 3	1 byte	2-5 bytes
CPU					
Model	DEC PDP-11 34, 70	CA LSI-2/60	CA LSI-2/60	Intel 8080A	Cascade Data
Add time, microseconds	2.7-7.3 (word)	8.24 msec (8 digits)	8.24 msec (8 digits)	200 (9 digits)	8.8 (word)
No. of programmable registers	8-16	8	8	6	16
No. of I/O ports on basic system and maximum	2, 64	4; 24	8; 24	2	5; 32
INTERNAL STORAGE					
Type	Core, MOS, bipolar	Core	Core	MOS	Core
Capacity of basic system, bytes	64K	64K	64K	5K	16K
Maximum capacity, bytes	204K	64K	304K	9K	64K
Increment size, bytes	16K	—	16K	4K	16K
Cycle time, microseconds	0.980	0.980	0.980	1.1	1.2 per byte
Access time, microseconds	0.490	0.520	0.520	—	0.35 per byte
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Opt., 2048K bytes	No	No	Std.; 3.6M bytes	No
Cartridge disk drive	Std., 112M bytes	Std.; 40M bytes	No	Opt.; 19M bytes	Std.. 40M bytes
Pack disk drive	Opt.; 1400M bytes	No	Std.; 640M bytes	No	No
Fixed-head disk/drum	Opt . 8M bytes	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Optional	Standard	Standard	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 300 cps	Opt.; 1300 cps	Opt.; 1300 cps	Optional	Opt., 300 cps
Paper tape punch	Opt.; 50 cps	Opt.; 60 cps	Opt., 60 cps	Optional	Opt.; 75 cps
Punched card reader	Opt.; 300-1200	Opt.; 300 cpm	Opt.; 300 cpm	Optional	Opt.; 300 cpm
Punched card punch	No	Opt.; 50 cpm	Opt. 50 cpm	No	No
Punched card reader/punch	No	None	None	No	No
Serial printer	Std.; 180 cps	1 Std.; 120 cps	Std.; 120 cps	Optional	Opt., 55 cps
Line printer	Opt.; 250-1200 lpm	Opt.; 300-600 lpm	Opt.; 300-600 lpm	Std.; 300 lpm	Opt.; 125-600 lpm
Reel-to-reel tape drive	Opt.; 10-72 KBS	Opt.; 20-40 KCS	Opt.; 20-40 KCS	Optional	Opt.; 30, 60 KBS
Cassette tape drive	Opt.; 4 KBS	No	No	No	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Std., 12 x 80 char., Opt.. 24 x 80 char	Std.; 1920 char	Std.; 1920 char.	Standard; 24 x 80 char.	Std., 16 x 80 char
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	64	24	24	1	8
Synchronous	Opt. to 50K bps	Opt.; 4800 bps	Opt.; 4800 bps	Std.; to 9600 bps	Opt.; to 9600 bps
Asynchronous	Opt.; to 9600 bps	Std.; 9600 bps	Std.; 9600 bps	Std.; to 9600 bps	Opt.; to 9600 bps
Protocols supported	IBM 2780, SDLC	IBM 2780, 3780, SDLC	IBM 2780, 3780, SDLC	IBM 2770, 2780, 3780	2780 bisync
SOFTWARE SUPPORT					
COBOL	Yes	No	No	No	No
RPG	Yes	No	No	No	Yes
FORTRAN	Yes	Yes	Yes	No	No
BASIC	Yes	No	No	Yes (CADOL)	No
Assembler	Yes	No	No	Yes	Yes
Other programming languages	DIBOL, DECform	ABOL	ABOL	None	None
Multiprogramming	Yes; 63 partitions	Yes. 24 partitions	Yes; 24 partitions	No	Yes, 2 partitions
Language implemented in firmware	No	No	No	Fully	No
Operating system implemented in firmware	No	Partially	Partially	Fully	No
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Retail, mfg., dist., whlsl., list maint	Distribution	Distribution	Dist. proc., text editing	Route acctg., Banking, Medical
Data base management system	DBMS-11	Yes	Yes	Yes	No
File access methods supported	Random, sequential, indexed sequential	Seq., Random, ISAM	Seq., Random, ISAM	Random, indexed sequential	All
Software separately priced	No	Yes	Yes	Yes	Yes
Technical help separately priced	No	Yes	Yes	No	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$40,000	$38,700	$65,800	$19,900*	$22,200
Monthly rental of basic system, $	$800	$850	$1,450	3rd party	$666
Date of first U.S. delivery	1976	7/76	12/76	April 1976	January 1970
Number installed in U.S. to date	NA	Not published	Not published	200	200+
COMMENTS	Supports all DEC operating systems, sorts, etc.	Single-source responsibility for software & service; applications program packages library	Single-source responsibility for software & service; applications program packages library	*Price includes 80-column printer; add $700 for 132-column unit; 2 floppy disk drives std., 6 max.	Add'l. industry applications; release acctg., public acctg., auto dealerships, grain elevators, film processors

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Cascade Data, Inc. Concept III	Cascade Data, Inc. Concept IV	CDA, Inc. INVOMAT-20	CDA, Inc. INVOMAT-40	CDA, Inc. INVOMAT-60
DATA FORMATS					
Word length, bits	16	8	16	16	16
Decimal digits per word	2	1	4	4	4
Bytes (characters) per word	2	1	2, 3	2, 3	2, 3
Operand length, words	1-256 bytes	1-256 bytes	½	½	½
Instruction length, words	2-5 bytes	1-2 bytes	1	1	1
CPU					
Model	Cascade Data	Cascade Data	DG Nova 1200/D-116	DG Nova 1200/D-116	DG Nova 1200/D-116
Add time, microseconds	7.5 (word)	2.0 (byte)	1.35	1.35	1.35
No. of programmable registers	16	14	4	4	4
No. of I/O ports on basic system and maximum	5; 32	6; 256	2; 4	4; 8	4; 12
INTERNAL STORAGE					
Type	Core	MOS	Core	Core	Core
Capacity of basic system, bytes	16K	16K	32K	32K	48K
Maximum capacity, bytes	64K	64K	64K	64K	64K
Increment size, bytes	16K	16K	16K	16K	16K
Cycle time, microseconds	1.0 per byte	1.0 per byte	1.35	1.35	1.35
Access time, microseconds	0.35 per byte	0.2 per byte	—	—	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Opt.; 1.2M bytes	Std.; 4.8M bytes	Std.; 0.6M bytes	Std.; 1.2M bytes	Std.; 2.4M bytes
Cartridge disk drive	Std.; 40M bytes	No	No	No	No
Pack disk drive	No	No	No	No	No
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	No	Optional	Optional
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 300 cps	No	Opt.; 300 cps	Opt.; 300 cps	Opt.; 300 cps
Paper tape punch	Opt.; 75 cps	No	Opt.; 10 cps	Opt.; 10 cps	Opt.; 10 cps
Punched card reader	Opt. 300 cpm	No	No	No	No
Punched card punch	No	No	No	No	No
Punched card reader/punch	No	No	No	No	No
Serial printer	Opt.; 55 cps	Opt.; 60 cps	Std.; 1; 30 cps	Std.; 1; 30 cps	Std.; 1; 165 cps
Line printer	Opt.; 125-600 lpm	Opt.; 200-400 lpm	No	Opt.; 200 lpm	Opt.; 300 lpm
Reel-to-reel tape drive	Opt.; 30, 60 KBS	No	No	No	No
Cassette tape drive	No	No	No	No	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Std.; 16 x 80 char.	Std.; 16 x 80 char.	Std.; 1; 960	Std.; 2; 960-1920	Std.; 3; 960-1920
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	8	8	No	4	4
Synchronous	Opt.; to 9600 bps	Std.; to 9600 bps	No	—	—
Asynchronous	Opt.; to 9600 bps	Std.; to 9600 bps	No	—	Opt.; to 9600 bps
Protocols supported	2780 bisync	2780 bisync	No	—	IBM 2780
SOFTWARE SUPPORT					
COBOL	No	No	No	No	No
RPG	Yes	No	No	No	No
FORTRAN	No	No	No	No	No
BASIC	No	Yes	No	No	No
Assembler	Yes	Yes	Yes	Yes	Yes
Other programming languages	None	None	No	No	No
Multiprogramming	Yes; 4 partitions	Yes; 2 partitions	No	No	No
Language implemented in firmware	No	Partially	No	No	No
Operating system implemented in firmware	No	Partially	No	No	No
General accounting packages	Yes	Yes	No	No	Yes
Industry application areas	Dist., MRP VSAM telecomm. network	Business acctg.	Distrib., inventory, acctg.	Distrib., inventory, acctg.	Distrib., inventory, acctg.
Data base management system	No	No	No	Yes	Yes
File access methods supported	All	All	Sequential; index sequential	Sequential; index sequential	Sequential; index sequential
Software separately priced	Yes	Yes	Some	Some	Some
Technical help separately priced	Yes	Yes	No	No	No
PRICING & AVAILABILITY					
Purchase price of basic system, $	$26,900	$14,000	$16,800	$23,600	$29,600
Monthly rental of basic system, $	$807	$420	$355	$500	$625
Date of first U.S. delivery	November 1977	April 1978	November 1974	May 1977	September 1977
Number installed in U.S. to date	NA	NA	50	8	NA
COMMENTS			Turnkey system; inventory mgt. program is included in price	Turnkey system; inventory management; invoicing, A/R programs are included in price	Turnkey system; Inventory/purchasing mgt., invoicing, and A/R programs are included in price

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	CDA, Inc. INVOMAT-200	Century Computer Century 300	Century Computer Century 400	Century Computer Century 700	Century Computer Century 900
DATA FORMATS					
Word length, bits	16	8	16	8, 16	8, 16
Decimal digits per word	4	2	4	4	4
Bytes (characters) per word	2, 3	1	2	2	2
Operand length, words	½	1	1	2	2
Instruction length, words	1	1-3	½ to 1½	½ to 3	½ to 3
CPU					
Model	DG Nova 1200/D-116	Century 200	Century 400	Century 400	Century 400
Add time, microseconds	1.35	2.6 (5 digits)	2.6 (5 digits)	2.6/5 digits	2.6/5 digits
No. of programmable registers	4	16	16	16	16
No. of I/O ports on basic system and maximum	4; 16	2,256	2,256	2; 256	2; 256
INTERNAL STORAGE					
Type	Core	MOS	MOS	MOS	MOS
Capacity of basic system, bytes	48K	32K	32K	32K	96K
Maximum capacity, bytes	64K	60K	240K	256K	512K
Increment size, bytes	16K	16K, 32K	32K	32K	32K
Cycle time, microseconds	1.35	0.6	0.6	.05	.05
Access time, microseconds	—	0.2	0.2	1.4	1.2
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Std., 1; 0.6M bytes	Opt.; 376K bytes	Opt.; 384K bytes	Opt.; 376K	Opt.; 376K
Cartridge disk drive	Std.; 1; 10M bytes	Std.; 20M bytes	Std.; 20M bytes	Std.; 20M bytes	Opt.; 40M bytes
Pack disk drive	No	Opt.; 100M bytes	Opt.; 100M bytes	Opt.; 200M bytes	Opt.; 600M bytes
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Optional	Optional
10-key numeric keyboard	Optional	Standard	Standard	Optional	Optional
Full accounting keyboard	No	Optional	Optional	Optional	Optional
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 300 cps	Opt.; 300, 400 cps	Opt.; 300, 400 cps	Opt.; 400 cps	Opt.; 400 cps
Paper tape punch	Opt.; 60 cps	No	No	Opt.; 150 cps	Opt.; 150 cps
Punched card reader	Opt.; 200 cpm	Opt.; 300, 600 cpm	Opt.; 300/600 cpm	Opt.; 300 cpm	Opt.; 300 cpm
Punched card punch	Opt.; 100 cpm	No	No	No	No
Punched card reader/punch	Opt.; 250/60 cpm	No	No	No	No
Serial printer	Std.; 165 cps	Std.; 165 cps	Opt.; 165 cps	300 lpm	600 lpm
Line printer	Opt.; 300 lpm	Opt.; 300, 600 lpm	Std.; 300, 600 lpm	120K bytes	120K bytes
Reel-to-reel tape drive	Opt.; 60 KBS	Opt.; 120 KBS	Opt.; 120 KBS	Opt.; 300 cps	300 cps
Cassette tape drive	No	Opt.; 300 cps	Opt.; 300 cps	No	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Std.; 3; 960-1920	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Std.; 24 x 80 char.	Std.; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	8	256	256	256	256
Synchronous	—	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; 9600 bps	Opt.; 9600 bps
Asynchronous	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; 9600 bps	Opt.; 9600 bps
Protocols supported	IBM 2780	CCS	CCS	CCS	CCS
SOFTWARE SUPPORT					
COBOL	Optional	No	No	No	No
RPG	No	No	No	No	No
FORTRAN	Optional	No	No	No	No
BASIC	Optional	Yes	Yes	Yes	Yes
Assembler	Yes	Yes	Yes	Yes	Yes
Other programming languages	No	CPL	CPL	CPL, MOD. Fortran	CPL
Multiprogramming	No	Yes; 10 partitions	Yes; 10 partitions	Yes; 20 partitions	Yes; 20 partitions
Language implemented in firmware	No	No	No	Partial	Partial
Operating system implemented in firmware	No	No	Partially	Partial	Partial
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Distrib., inventory, accounting	Bus. acct'g., dist.	Bus. acct'g., dist.	Distribution, Business, Finance	Business, Finance, Hotel
Data base management system	Yes	Yes	Yes	Yes	Yes
File access methods supported	Sequential, index sequential	Random sequential, index seq.	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index, seq.
Software separately priced	Some	Yes	Yes	Yes	Yes
Technical help separately priced	No	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$37,500	$30,000	$34,000	$38,000	$45,000
Monthly rental of basic system, $	$790	Purchase only	Purchase only	Purchase/lease	Purchase/lease
Date of first U.S. delivery	June 1975	February 1971	March 1975	April 1976	February 1977
Number installed in U.S. to date	10	Over 600	117	40	23
COMMENTS	Turnkey system; inventory/purchasing management, invoicing, and A/R programs are included in price	Turnkey system or business accounting; all software sold separately	Turnkey business accounting system with communications capability	Designed for general bus., distribution, & finance markets; expandable with software/hardware	Designed for large data base processing, real-time operating environment, finance, hotels, inventory control

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Century Computer Century 1000	Complete Computer System #2820	Complete Computer System #2851	Complete Computer System #3510	Complete Computer System #3720
DATA FORMATS					
Word length, bits	8, 16, 24	16 + 1	16 + 1	16 + 1	16 + 1
Decimal digits per word	4	4	4	4	4
Bytes (characters) per word	2	2	2	2	2
Operand length, words	2	1	1	1	1
Instruction length, words	½ to 3	1	1	1	1
CPU					
Model	Century 400	DG Nova 2/10	DG Nova 2/10	DG Nova 3/4	DG Nova 3/12
Add time, microseconds	2.6/5 digits	1 (1 word)	1 (1 word)	0.7 (1 word)	0.7 (1 word)
No. of programmable registers	16	16	16	32	32
No. of I/O ports on basic system and maximum	2; 256	4; 12	7; 11	3; 4	4; 20
INTERNAL STORAGE					
Type	MOS	Core	Core	MOS	MOS
Capacity of basic system, bytes	128K	64K	64K	64K	64K
Maximum capacity, bytes	512K	64K	64K	64K	256K
Increment size, bytes	32K	—	—	—	32K
Cycle time, microseconds	1.2	1	1	0.70	0.70
Access time, microseconds	0.5	—	—	0.35	0.35
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Opt.; 376K	Opt.; 630K bytes	Opt.; 630K bytes	Opt.; 630K bytes	Opt.; 630K bytes
Cartridge disk drive	Opt.; 40M bytes	Std.; 46.4M bytes	Std.; 46.4M bytes	Std.; 232M bytes	Std.; 46.4M bytes
Pack disk drive	Opt.; 900M bytes	No	No	No	No
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Optional	Standard	Standard	Standard	Standard
10-key numeric keyboard	Optional	Standard	Standard	Standard	Standard
Full accounting keyboard	Optional	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 400 cps	Opt.; 400 cps	Opt.; 400 cps	Opt.; 400 cps	Opt.; 400 cps
Paper tape punch	Opt.; 150 cps	Opt.; 60 cps	Opt.; 60 cps	Opt.; 60 cps	Opt.; 60 cps
Punched card reader	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm
Punched card punch	No	No	No	No	No
Punched card reader/punch	No	No	No	No	No
Serial printer	1200 lpm	Std.; 330 cps	Std.; 330 & 30 cps	Std.; 60 cps	Std.; 180 cps
Line printer	120K bytes	Opt.; 300 lpm	Opt.; 300 lpm	Opt.; 300 lpm	Opt.; 300 lpm
Reel-to-reel tape drive	300 cps	Opt.; 36 KBS	Opt.; 36 KBS	No	Opt.; 36 KBS
Cassette tape drive	No	Opt.; 1.6 KBS	Opt.; 1.6 KBS	No	Opt.; 1.6 KBS
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Std.; 24 x 80 char.	Std.; 1920 char. 24 x 80	Std.; 1920 char.	Std.; 1920 char.	Std.; 1920 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	256	10	9	2	18
Synchronous	Opt.; 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Asynchronous	Opt.; 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Protocols supported	CCS	Opt.; 2780 via DG RSTCP	Opt.; 2780 via DG RSTCP	Opt.; 2780 via DG RSTCP	Opt.; 2780 via DG RSTCP
SOFTWARE SUPPORT					
COBOL	No	No	No	No	No
RPG	No	No	No	No	No
FORTRAN	No	Yes	Yes	Yes	Yes
BASIC	Yes	Yes	Yes	Yes	Yes
Assembler	Yes	Yes	Yes	Yes	Yes
Other programming languages	CPL, ALGOL	"CREATE" DBMS	"CREATE" DBMS	"CREATE" DBMS	"CREATE" DBMS
Multiprogramming	Yes; 20 partitions	Yes	Yes	Yes	Yes
Language implemented in firmware	Partially	Partially	Partially	Partially	Partially
Operating system implemented in firmware	Partially	Partially	Partially	Partially	Partially
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Bus., fin., dist., hotel, medicine	Mfg., costing, dist., printing	Mortgage banking, mfg.	Property mgt., mfg., dist.	Municipal acctg., mfg., DBMS, dist.
Data base management system	Yes	Yes	Yes	Yes	Yes
File access methods supported	Random, sequential, index seq.	Seq., Random, ind. seq.	Seq., random, ind. seq.	Seq., random, ind. seq.	Seq., random, ind. seq.
Software separately priced	Yes	Yes	Yes	Yes	Yes
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$65,000	$35,675	$41,275	$23,850	$28,300
Monthly rental of basic system, $	Purchase/lease	$774	$895	$517	$614
Date of first U.S. delivery	June 1977	March 1974	December 1974	October 1976	September 1976
Number installed in U.S. to date	6	NA	NA	NA	NA
COMMENTS	Large data base management systems; real-time/batch processing	Includes two CRT's and hardware floating-point unit	The 30-cps printer includes forms control; system includes hardware floating-point unit	Disk storage expandable to 100MB	Disk storage expandable to 100MB

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Complete Computer System #3955	Compucorp 402	Compucorp 450	Compucorp 450/D	Compucorp 450/DP
DATA FORMATS					
Word length, bits	16 + 1	64	64	64	64
Decimal digits per word	4	13	13	13	13
Bytes (characters) per word	2	8	8	8	8
Operand length, words	1	1, 2	1, 2	1, 2	1, 2
Instruction length, words	1	1-7 bytes	1-7 bytes	1-7 bytes	1-7 bytes
CPU					
Model	DG Nova 3/12	Compucorp 3000	Compucorp 3000	Compucorp 3000	Compucorp 3000
Add time, microseconds	0.7 (1 word)	80 (13 digits)	80 (13 digits)	80 (13 digits)	80 (13 digits)
No. of programmable registers	32	—	—	—	—
No. of I/O ports on basic system and maximum	4/20	—	—	—	—
INTERNAL STORAGE					
Type	MOS	MOS	MOS	MOS	MOS
Capacity of basic system, bytes	96K	12K	16K	16K	16K
Maximum capacity, bytes	256K	16K	16K	16K	16K
Increment size, bytes	32K	4K	None	None	None
Cycle time, microseconds	0.7	—	—	—	—
Access time, microseconds	0.5	—	—	—	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Opt.; 630K bytes	Std.; 1.2M bytes	Std.; 1.2M bytes	Std.; 1.2M bytes	Std.; 1.2M bytes
Cartridge disk drive	Std.; 384M bytes	No	No	No	No
Pack disk drive	No	No	No	No	No
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	Standard	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 400 cps	No	No	No	No
Paper tape punch	Opt.; 400 cps	No	No	No	No
Punched card reader	Opt.; 300 cpm	No	No	No	No
Punched card punch	No	No	No	No	No
Punched card reader/punch	No	No	No	No	No
Serial printer	Std.; 660 cps	Std.; 30 cps	Std.; 30 cps	Std.; 30 cps	Std.; 30 cps
Line printer	Opt.; 300 lpm	No	No	No	No
Reel-to-reel tape drive	Opt.; 36 KBS	Opt.; 40 KBS	No	No	No
Cassette tape drive	Opt.; 1.6 KBS	No	No	No	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Std.; 1920 char. char.	Optional; 24 x 80 char.	Optional; 24 x 80 char.	Standard; 24 x 80 char.	Optional; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	18	4	7	7	7
Synchronous	Opt.; to 9600 bps	No	No	No	No
Asynchronous	Opt.; to 9600 bps	Std.; to 4800 bps	Std.; to 4800 bps	Std.; to 4800 bps	Std.; to 4800 bps
Protocols supported	Opt.; 2780 VIA D.G. RSTCP	None	None	None	None
SOFTWARE SUPPORT					
COBOL	Optional	No	No	No	No
RPG	Optional	No	No	No	No
FORTRAN	Yes	No	No	No	No
BASIC	Yes	No	No	No	No
Assembler	Yes	Yes	Yes	Yes	Yes
Other programming languages	"CREATE" & ALGOL	None	None	None	None
Multiprogramming	Yes	No	No	No	No
Language implemented in firmware	Partially	Partially	Partially	Partially	Partially
Operating system implemented in firmware	Partially	Fully	Fully	Fully	Fully
General accounting packages	Yes	No	No	No	No
Industry application areas	Shared logic; word proc. & DBMS	Agric. bus.; gen'l. bus.	Agric. bus.; gen'l. bus.	Agric. bus.; gen'l. bus.	Agric. bus.; gen'l. bus.
Data base management system	Yes	Yes	Yes	Yes	Yes
File access methods supported	Seq., random, index seq.	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index seq.
Software separately priced	Yes	No	No	No	No
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$55,500	$12,880	$11,490	$14,550	$15,320
Monthly rental of basic system, $	$1,204	Purchase only	Purchase only	Purchase only	Purchase only
Date of first U.S. delivery	October 1976	January 1976	April 1976	June 1976	April 1976
Number installed in U.S. to date	NA	15	2	1	1
COMMENTS	System includes floating-point processor; handles word processing along with DBMS or business applications	Over 400 delivered in Europe; kits available to upgrade Monroe 1800 Series calculators to 402 status	Also being delivered in Europe; includes magnetic card reader	Also being delivered in Europe; includes magnetic card reader	Also being delivered in Europe; includes magnetic card reader

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Compucorp 450-OPD	Compucorp 625	Compudata Systems (DEC 300 Series)	Compudata Systems (DEC 500 Series)	Compudata Systems (IBM Series/1)
DATA FORMATS					
Word length, bits	64	48	16 + 2	16 + 2	16
Decimal digits per word	13	12	5	5	5
Bytes (characters) per word	8	6	2	2	2
Operand length, words	1	—	1, 2	1, 2	1
Instruction length, words	1, 2	1, 4	1, 2, 3	1, 2, 3	1, 2, 3
CPU					
Model	Compucorp 3000	Zilog Z-80	DEC LSI-11, PDP-11/34	DEC PDP-11/34, 11/70	IBM 4953/4955
Add time, microseconds	80	50	2.03	0.30-1.20	4.2
No. of programmable registers	32	—	6	12	32
No. of I/O ports on basic system and maximum	16	256	1-8	1-64	4-56
INTERNAL STORAGE					
Type	MOS	MOS	MOS	Core	MOS
Capacity of basic system, bytes	8K	24K	32K	128K	64K
Maximum capacity, bytes	16K	65K	256K	512K	128K
Increment size, bytes	4K	8K	32K	32K	32K
Cycle time, microseconds	4	1.6	0.98; 0.725	0.98	0.66
Access time, microseconds	4	0.4	0.51/0.635	0.36	0.50
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Std.; 630K bytes	Std.; 630K bytes	Opt.; 310K bytes	Opt.; 310K bytes	Opt.; 2.5M bytes
Cartridge disk drive	No	Optional	Std.; 2.5 or 5M bytes	Std.; 2.5 or 5M bytes	Opt.; 9 or 13M bytes
Pack disk drive	No	No	Opt.; 14M bytes	Opt.; 14, 88, 176 MB	No
Fixed-head disk/drum	No	No	No	Opt.; 512M bytes	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	Standard	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	No	Optional	Optional	No
Paper tape punch	No	No	Optional	Optional	No
Punched card reader	No	No	No	Optional	No
Punched card punch	No	No	No	No	No
Punched card reader/punch	No	No	Opt.; 300 cpm	Opt.; 300, 1200 cpm	No
Serial printer	Std.; 30 cps	Std.; 80 cps	Std.; 180 cps	Std.; 180 cps	Opt.; 120 cps
Line printer	Optional	Optional	Opt.; 300 lpm	Opt.; 300 lpm	Opt.; 155 lpm
Reel-to-reel tape drive	Optional	Optional	Opt.; 800/1600 bpi	Opt.; 800/1600 bpi	No
Cassette tape drive	No	No	No	No	No
Cartridge tape drive	No	Optional	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Std.; 1920 char.	Std.; 1024 char.	Std.; 1920 char.	Std.; 1920 char.	Std.; 1920 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	4	4	32	64	256
Synchronous	No	No	Opt.; 2400 bps	Opt.; 2400 bps	Opt.; 2400 bps
Asynchronous	Optional	Optional	Std.; 9600 bps	Std.; 9600 bps	Std.; 9600 bps
Protocols supported	RS-232	RS-232	IBM 2780/3780	IBM 2780/3780	IBM 2780/3780
SOFTWARE SUPPORT					
COBOL	No	No	No	Yes	Yes
RPG	No	No	No	Yes	No
FORTRAN	No	No	Yes	Yes	Yes
BASIC	No	Yes	No	Yes	No
Assembler	Yes	Yes	No	No	Yes
Other programming languages	No	No	DIBOL	DIBOL	No
Multiprogramming	No	No	Yes	Yes	Yes
Language implemented in firmware	Partially	No	No	No	No
Operating system implemented in firmware	Partially	No	No	No	No
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Various	Various	Manuf., distrib., services, retail	Manuf., distrib., services, retail	Manuf., distrib., services, retail
Data base management system	Yes	Yes	Yes	Yes	No
File access methods supported	Random, keyed, hashed	Random, keyed, hashed	Sequential, random, index sequential	Sequential, random, index sequential	Sequential, random, index sequential
Software separately priced	Yes	Yes	Yes	Yes	Yes
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$15,000	$7,000	$17,000	$60,000	$26,000
Monthly rental of basic system, $	—	—	$350	$1,250	$540
Date of first U.S. delivery	February 1976	July 1977	1975	1976	1977
Number installed in U.S. to date	100	NA	100	25	1
COMMENTS					

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Computer Automation SyFA	Computer Covenant CPBS 1	Computer Covenant CPBS 2	Computer Covenant CPBS 3	Computer Hardware Inc. 2130
DATA FORMATS					
Word length, bits	16	16	16	16	16
Decimal digits per word	2	2	2	2	2
Bytes (characters) per word	2	2	2	2	2
Operand length, words	1 bit to 255 bytes	1, 2	1, 2	1, 2	16
Instruction length, words	1, 2	1	1	1	1
CPU					
Model	CA LSI-2/60	DEC PDP-11/04	DEC PDP-11/34	DEC PDP-11/70	CHI 2130
Add time, microseconds	76 (5 digits)	3.2 (1 word)	3.2 (1 word)	0.40 (1 word)	2.7
No. of programmable registers	2	8	9	10	8
No. of I/O ports on basic system and maximum	2, 6	9	4	26	21; 128
INTERNAL STORAGE					
Type	Core	MOS	MOS	Core	MOS
Capacity of basic system, bytes	64K	56K	64K	256K	16K bytes
Maximum capacity, bytes	304K	56K	248K	2048K	4M bytes
Increment size, bytes	16K	None	16K	64K, 256K	16K bytes
Cycle time, microseconds	1.2	0.98	0.51	0.38	0.8
Access time, microseconds	0.5	0.49	0.26	0.19	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	Opt.; 512K bytes	Opt.; 512K bytes	No	—
Cartridge disk drive	Std.; 40M bytes	Opt.; 10M bytes	Std.; 10M bytes	Opt.; 10M bytes	Opt.; 2M bytes
Pack disk drive	Opt.; 640M bytes	No	Opt.; 1408M bytes	Std.; 1408M bytes	Std.; 1200M bytes
Fixed-head disk/drum	No	No	No	No	Opt.; 2M bytes
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Optional	Standard	Standard	Standard	Standard
10-key numeric keyboard	Optional	Standard	Standard	Standard	Optional
Full accounting keyboard	No	No	No	No	Optional
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	No	No	No	Opt.; 300 cps
Paper tape punch	No	No	No	No	Opt.; 110 cps
Punched card reader	No	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 1000 cpm
Punched card punch	No	No	No	No	Optional (IBM 1442)
Punched card reader/punch	No	No	No	No	Optional (IBM 1442)
Serial printer	Opt.; 100, 165 cps	Std.; 30, 180 cps	Std.; 30, 180 cps	Std.; 30, 180 cps	Opt.; 60 cps
Line printer	Opt.; 300, 600 lpm	Opt.; 300 lpm	Opt.; 300-1200 lpm	Opt.; 300-1200 lpm	Std.; 600 lpm
Reel-to-reel tape drive	No	Opt.; 10-120 KBS	Opt.; 10-120 KBS	Opt.; 10-120 KBS	Opt.; 75 lps
Cassette tape drive	No	No	No	No	Opt.; 30 cps
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Optional; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Std.; 1920 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	25	4	16	60	32 async.; 4 sync.
Synchronous	Opt.; to 4800 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 4800 bps
Asynchronous	Std.; to 2400 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Protocols supported	IBM 2780/3780 HASP	IBM 2780, bisync, SDLC, DDCMP	IBM 2780, bisync, SDLC, DDCMP	IBM 2780, bisync, DLC, DDCMP	IBM 3270, 2780, 3780, 3741
SOFTWARE SUPPORT					
COBOL	No	No	Yes	Yes	Yes
RPG	No	No	No	No	Yes
FORTRAN	Yes	Yes	Yes	Yes	Yes
BASIC	Yes	Yes	Yes	Yes	Yes
Assembler	No	Yes	Yes	Yes	ALGOL, SNOBOL
Other programming languages	SYBOL	DIBOL-11	DIBOL-11	DIBOL-11	Yes; 32 partitions
Multiprogramming	Yes; 43 partitions	Yes; 4 partitions	Yes; 16 partitions	Yes; 60 partitions	No
Language implemented in firmware	No	No	No	No	No
Operating system implemented in firmware	No	No	No	No	Partially
General accounting packages	No	Yes	Yes	Yes	Yes
Industry application areas	Distributed processing	Manufacturing, dist./wholesale	Manufacturing, dist./wholesale	Manufacturing, dist./wholesale	General accounting
Data base management system	No	RMS-11	RMS-11	RMS-11/DBMS-11	Yes
File access methods supported	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index seq.
Software separately priced	Yes	Yes	Yes	Yes	Some
Technical help separately priced	No	Yes	Yes	Yes	No
PRICING & AVAILABILITY					
Purchase price of basic system, $	$45,000	$24,000	$42,000	$100,000	Consult factory
Monthly rental of basic system, $	NA	$530 (5-yr. lease)	$910 (5-yr. lease)	$2,150 (5-yr. lease)	Consult factory
Date of first U.S. delivery	1976	June 1976	September 1976	December 1976	1974
Number installed in U.S. to date	NA	2	2	1	NA
COMMENTS	Supports up to 24 terminals and up to 35 peripherals; FORTRAN and BASIC are unbundled	Includes 180-cps serial printer	Includes 180-cps serial printer	High-speed controllers and dual access disk drives; cache memory	Hardware floating-point available

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Computer Hardware Inc. 3230	Computer Hardware Inc. 4210	Computer Horizons CHC Distribution System	Computer Interactions Compo-II	Control Data Cyber 18-10
DATA FORMATS					
Word length, bits	16	16	16	12	16
Decimal digits per word	2	2	2	3	—
Bytes (characters) per word	2	2	2	2 (6-bit)	2
Operand length, words	16	16	½ or 1	1	—
Instruction length, words	1	1	1-3	1, 2	1-3
CPU					
Model	CHI 3231	CHI 4210	DEC PDP-11/34	DEC PDP-8/E or F	Cyber 18-10
Add time, microseconds	2.7	50	2 (1 word)	15 (5 digits)	1.76 (1 word)
No. of programmable registers	8	16	8	8	22
No. of I/O ports on basic system and maximum	21; 128	12	3, 7	3, 32	2 per memory mod.
INTERNAL STORAGE					
Type	MOS	MOS	MOS, core	Core, MOS	Core, MOS
Capacity of basic system, bytes	16K bytes	8K bytes	16K	16K	32K
Maximum capacity, bytes	4M bytes	4M bytes	248K	64K	64K
Increment size, bytes	16K bytes	8K bytes	16K, 32K, 64K	8K	16K
Cycle time, microseconds	0.8	1.2	0.49, 0.725, 0.98	1.2	0.75
Access time, microseconds	—	—	—	0.6	0.3
MASS STORAGE CAPABILITIES*					
Floppy disk drive	—	Std.; 1.0M bytes	No	Opt.; 256K bytes	Opt.; 560K bytes
Cartridge disk drive	Opt.; 2M bytes	Opt.; 3M bytes	No	Std.; 26M bytes	No
Pack disk drive	Std.; 1200M bytes	—	Std.; 88M bytes	Opt.; 90M bytes	No
Fixed-head disk/drum	Opt.; 2M bytes	—	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Optional	Standard	No	Yes	Standard
10-key numeric keyboard	Optional	Optional	No	Yes	Standard
Full accounting keyboard	Optional	Optional	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Optional	No	No	Opt.; 300 cps	No
Paper tape punch	Optional	No	No	Opt.; 60 cps	No
Punched card reader	Optional	Optional	No	Opt.; 600-1200	Std.; 300, 600 cps
Punched card punch	Optional	No	No	No	No
Punched card reader/punch	Optional	No	No	No	No
Serial printer	Optional	Opt.; 180 cps	Std.; 180 cps	Opt.; 165, 300 cps	No
Line printer	Optional	Opt.; 300 lpm	Opt.; 1200 lpm	Std.; 300 lpm	Opt.; 300, 600 lpm
Reel-to-reel tape drive	Optional	No	Std.; 75 ips	Opt.; 20, 40 KBS	Opt.; 20 KBS
Cassette tape drive	Optional	Standard	No	No	No
Cartridge tape drive	No	No	No	Opt.; 40 KBS	No
Magnetic ledger card device	No	No	No	No	No
CRT	Opt.; 1920 char.	Opt.; 1920 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	32 async.; 4 sync.	8 async.; 1 sync.	64	32	—
Synchronous	Opt.; to 4800 bps	Opt.; to 4800 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Asynchronous	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 2400 bps	Opt.; to 19.2K bps
Protocols supported	IBM 3270, 2780, 3780, 3741	IBM 3780	HDLC, ADDCP, DDCMP, SDLC	None	IBM 2780/3780, HASP, CDC 200
SOFTWARE SUPPORT					
COBOL	Yes	No	Yes	No	No
RPG	Yes	No	No	No	No
FORTRAN	Yes	Yes	No	Yes	No
BASIC	Yes	No	Yes	Yes	No
Assembler	Yes	Yes	No	Yes	Yes
Other programming languages	ALBOL, SNOBOL	—	None	None	None
Multiprogramming	Yes; 32 partitions	Yes; 8 partitions	Yes; 32 partitions	Yes; 4 partitions	No
Language implemented in firmware	No	No	No	No	No
Operating system implemented in firmware	Partially	No	No	No	No
General accounting packages	Yes	Yes	Yes	Yes	No
Industry application areas	General accounting	General accounting	Inv., order proc., business acct'g.	Wholesale dist., pharm., medical	Under development
Data base management system	Yes	No	No	No	No
File access methods supported	Random, sequential, index seq.	Sequential, random	Sequential, index sequential	Random, sequential, index seq.	—
Software separately priced	Some	Yes	No	No	Yes
Technical help separately priced	No	No	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	Consult factory	Consult factory	$30,000	$50,000	$27,840
Monthly rental of basic system, $	Consult factory	Consult factory	No	$1,200 (5-yr. lease)	$933 (3-yr. lease)
Date of first U.S. delivery	1976	1977	NA	2nd quarter 1972	May 1976
Number installed in U.S. to date	NA	NA	0	77	NA
COMMENTS	Hardware floating-point available		DEC PDP-11/70 CPU can also be used	System has paged memory	Lower prices for quantity purchasers; full-payout 5-yr. lease plans also available

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Control Data Cyber 18-20	Corstar Business Computing Co. Corstar 310	Corstar Business Computing Co. Corstar 350	Corstar Business Computing Co. Corstar 534	Corstar Business Computing Co. Corstar 570
DATA FORMATS					
Word length, bits	16	12	16	16	16
Decimal digits per word	—	2	2	2	2
Bytes (characters) per word	2	2 (6-bit)	2	2	2
Operand length, words	—	1, 2	1, 2	1, 2	1, 2
Instruction length, words	1-3	1, 2	1, 2	1, 2	1, 2
CPU					
Model	Cyber 18-20	DEC Datasystem 310	DEC Datasystem 350	DEC Datasystem 534	DEC Datasystem 570
Add time, microseconds	1.76 (1 word)	2.8	7.0 (11/10); 1.0 (11/40)	6.0	2.7
No. of programmable registers	22	8	8; 10	10	16
No. of I/O ports on basic system and maximum	2 per memory mod.	—	—	—	—
INTERNAL STORAGE					
Type	MOS	Core, MOS	Core	Core, MOS	Core
Capacity of basic system, bytes	32K	16K (6-bit)	32K	64K	128K
Maximum capacity, bytes	256K	64K (6-bit)	64K	248K	1024K
Increment size, bytes	32K, 64K	16K (6-bit)	32K	16K	64K
Cycle time, microseconds	0.75	1.4	0.98	0.98; 0.725	0.98
Access time, microseconds	0.3	0.7	0.49	0.49; 0.500	0.49
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Opt.; 560K bytes	Std.; 1.2M bytes	No	No	No
Cartridge disk drive	No	Opt.; 1.28M bytes	Std.; 19.2M bytes	Std.; 19.2M bytes	Std.; 19.2M bytes
Pack disk drive	Opt.; 400M bytes	No	Opt.; 160M bytes	Opt.; 704M bytes	Std.; 1408M bytes
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Optional	Standard	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	Optional	Optional	Optional	Optional
Paper tape punch	No	Optional	Optional	Optional	Optional
Punched card reader	Std.; 300, 600 cps	Optional	Optional	Optional	Optional
Punched card punch	No	No	No	No	No
Punched card reader/punch	No	No	No	No	No
Serial printer	No	Std.; 180 cps	Std.; 180 cps	Opt.; 180 cps	Opt.; 180 cps
Line printer	Opt.; 300, 600 lpm	Opt.; 300 lpm	Opt.; 300 lpm	Std.; 300 lpm	Std.; 300 lpm
Reel-to-reel tape drive	Opt.; 20 KBS	No	Optional	Optional	Optional
Cassette tape drive	No	No	No	No	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Standard; 24 x 80 char.	Standard; 12 x 80, 24 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	—	1	4	32	63
Synchronous	Opt.; to 9600 bps	Opt.; to 2200 bps	Opt.; to 2200 bps	Opt.; to 2200 bps	Opt.; to 2200 bps
Asynchronous	Opt.; to 19.2K bps	No	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Protocols supported	—	IBM 2780	IBM 2780	IBM 2780	IBM 2780
SOFTWARE SUPPORT					
COBOL	No	No	No	Yes	Yes
RPG	No	No	No	RPG II	RPG II
FORTRAN	Yes	No	No	Yes	Yes
BASIC	Yes	No	No	BASIC Plus	BASIC Plus
Assembler	Macro assembler	No	No	No	No
Other programming languages	None	DIBOL	DIBOL	None	None
Multiprogramming	Yes; 16 partitions	No	Yes; 4 partitions	Yes; 32 partitions	Yes; 63 partitions
Language implemented in firmware	No	No	No	No	No
Operating system implemented in firmware	No	Yes	Yes	Yes	Yes
General accounting packages	No	Manufacturing, distribution	Manufacturing, distribution	Advert. agency, financial	Financial, publishing
Industry application areas	Manufacturing, distribution				
Data base management system	No	No	No	No	No
File access methods supported	—	Random, sequential, index sequential	Random, sequential, index sequential	Random, sequential, index sequential	Random, sequential, index sequential
Software separately priced	Yes	Yes	Yes	Yes	Yes
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$29,940	$13,000-$23,000	$36,000-$65,000	$75,000-$125,000	$135,000-$250,000
Monthly rental of basic system, $	$981 (3-yr. lease)	Purchase only	Purchase only	Purchase only	Purchase only
Date of first U.S. delivery	August 1976	1972	October 1975	November 1973	June 1975
Number installed in U.S. to date	NA	10	4	14	4
COMMENTS	Lower prices for quantity purchasers; full-payout 5-yr. lease plans also available				

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Data Communications Corp. TPS	Data Communications Corp. DPS	Data Communications Corp. DCS	Data General CS/40 Mod. C1	Data General CS/40 Mod. C3
DATA FORMATS					
Word length, bits	16	16	16	16	16
Decimal digits per word	4	4	4	4	4
Bytes (characters) per word	2	2	2	2	2
Operand length, words	1	1, 2	1	1	1
Instruction length, words	1	1, 2	1	1	1
CPU					
Model	DG Nova 3/12	DG S/200, C/300	DG Nova 3/4	DG Nova 3/12	DG Nova 3/12
Add time, microseconds	0.800 (1 word)	0.600 (1 word)	0.800 (1 word)	0.700 (1 word)	0.700 (1 word)
No. of programmable registers	4	16	4	4	4
No. of I/O ports on basic system and maximum	4; 24	5; 59	4; 24	1; 1	1; 4
INTERNAL STORAGE					
Type	Core	Core	Core	MOS	MOS
Capacity of basic system, bytes	96K	32K, 64K	8K	64	64
Maximum capacity, bytes	256K	256K	32K	64	64
Increment size, bytes	32K	16K	8K	—	—
Cycle time, microseconds	0.800	0.800	0.800	0.700	0.700
Access time, microseconds	0.400	0.400	0.400	—	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Opt.; 500K bytes	Opt.; 500K bytes	Opt.; 500K bytes	Std.; 315K bytes	Std.; 315K bytes
Cartridge disk drive	Std.; 10M bytes	Std.; 10M bytes	Std.; 10M bytes	Std.; 10M bytes	Std.; 10M bytes
Pack disk drive	Opt.; 92M bytes	Opt.; 92M bytes	Opt.; 92M bytes	No	No
Fixed-head disk/drum	Opt.; 2M bytes	Opt.; 2M bytes	Opt.; 2M bytes	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Optional	Standard	Optional	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 400 cps	Opt.; 400 cps	Opt., 400 cps	No	No
Paper tape punch	Opt.; 70 cps	Opt.; 70 cps	Opt.; 70 cps	No	No
Punched card reader	Opt.; 150-1000 cpm	Opt.; 150-1000 cpm	Opt.; 150-1000 cpm	No	No
Punched card punch	No	No	No	No	No
Punched card reader/punch	No	No	No	No	No
Serial printer	Std.; 165 cps	Std.; 165 cps	Std.; 165 cps	Std.; 165 cps	Std.; 165 cps
Line printer	Opt.;300-1200 lpm	Opt.; 200-1200 lpm	Opt.; 300-1200 lpm	Std.; 300 lpm	Std.; 300 lpm
Reel-to-reel tape drive	Opt.; 60 KBS	Opt.; 60 KBS	Opt.; 60 KBS	Opt.; 60 KCS	Opt.; 60 KCS
Cassette tape drive	Optional	Optional	Optional	No	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Std.; 24 x 80; single-term model	Std.; 24 x 80; up to 4 units
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	256	256	256	1	1
Synchronous	Opt.; to 9600 bps	Opt.; to 50K bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Asynchronous	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	No	No
Protocols supported	All	All	All	IBM 2780/3780	IBM 2780/3780
SOFTWARE SUPPORT					
COBOL	Yes	Yes	Yes	Yes	Yes
RPG	No	RPG II	Yes	No	No
FORTRAN	FORTRAN IV, V	FORTRAN IV, V	FORTRAN IV, V	No	No
BASIC	Yes	Yes	Yes	No	No
Assembler	Yes	Yes	Yes	No	No
Other programming languages	ALGOL	ALGOL	ALGOL	No	No
Multiprogramming	No	Yes; 1F, 1B	Yes	No	Yes
Language implemented in firmware	No	Fully	No	No	No
Operating system implemented in firmware	No	No	No	No	No
General accounting packages	Yes	Yes	Yes	No	No
Industry application areas	Mortgages	Mortgages	Gen'l. mktg., mortgages, broadcasting	—	—
Data base management system	No	INFOS	No	No	No
File access methods supported	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index sequential	Sequential, random, ISAM	Sequential, random, ISAM
Software separately priced	Yes	Yes	Yes	No	No
Technical help separately priced	Yes	Yes	Yes	No	No
PRICING & AVAILABILITY					
Purchase price of basic system, $	$7,500	$10,000	$5,000	$32,915	$34,165
Monthly rental of basic system, $	Purchase only	Purchase only	Purchase only	$741	$769
Date of first U.S. delivery	NA	September 1976	March 1977	September 1977	September 1977
Number installed in U.S. to date	NA	NA	NA	NA	NA
COMMENTS	Transactional Processing System	Distributed Processing System	Data Collection System	Interactive COBOL; built-in screen handlers	Interactive COBOL; up to 4 terminals; multiterminal control & built-in screen handlers

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Data General CS/40 Mod. C5	Datapoint Cassette 1100	Datapoint Diskette 1100	Datapoint 1150	Datapoint 1170
DATA FORMATS					
Word length, bits	16	8-bit byte	8-bit byte	8-bit byte	8-bit byte
Decimal digits per word	4	1 per byte	1 per byte	1 per byte	1 per byte
Bytes (characters) per word	2	1 per byte	1 per byte	1 per byte	1 per byte
Operand length, words	1	1 byte	1 byte	1 byte	1 byte
Instruction length, words	1	1-3 bytes	1-3 bytes	1-3 bytes	1-3 bytes
CPU					
Model	DG Nova 3/D	Datapoint 1100	Datapoint 1100	Datapoint 1150	Datapoint 1170
Add time, microseconds	0.700 (1 word)	4.8	4.8	1.4	1.4
No. of programmable registers	4	14	14	16	16
No. of I/O ports on basic system and maximum	1, 9	1	1	2	4
INTERNAL STORAGE					
Type	MOS	MOS	MOS	MOS	MOS
Capacity of basic system, bytes	128	4K	16K	24K (user)	48K (user)
Maximum capacity, bytes	192	8K	16K	24K (user)	48K (user)
Increment size, bytes	64	4K	None	None	None
Cycle time, microseconds	0.700	1.6	1.6	0.8	0.8
Access time, microseconds	—	0.6	0.3	0.3	0.3
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Std.; 315K bytes	No	Std.; 1M bytes	Std.; 1M bytes	Std.; 1M bytes
Cartridge disk drive	Std.; 10M bytes	No	No	No	No
Pack disk drive	No	No	No	No	No
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	Standard	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	No	No	No	No
Paper tape punch	No	No	No	No	No
Punched card reader	No	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm
Punched card punch	No	No	No	No	No
Punched card reader/punch	No	No	No	No	No
Serial printer	Std.; 165 cps	Opt.; 120 lpm	Opt.; 120 lpm	Opt.; 80/120 cps	Opt.; 80/120 cps
Line printer	Std.; 300 lpm	Opt.; 300-600 lpm	Opt.; 300-500 lpm	Opt.; 300, 600 lpm	Opt.; 300, 600 lpm
Reel-to-reel tape drive	Opt.; 60K cps	Opt.; 9.6-20 KBS	Opt.; 9.6-20 KBS	Opt.; to 1600 bpi	Opt.; to 1600 bpi
Cassette tape drive	No	Std.; 352 cps	No	No	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Std.; 24 x 80; up to 9 units	Standard; 12 x 80 char.	Standard; 12 x 80 char.	Std.; 12 x 80 char.	Std.; 12 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	1	1	1	1	5
Synchronous	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Asynchronous	No	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Protocols supported	IBM 2780/3780	IBM 2265, 2741, 2780/3780, HASP	IBM 2265, 2741, 2780/3780, HASP	IBM, Burroughs, CDC, HIS, Univac	IBM, Burroughs, CDC, HIS, Univac
SOFTWARE SUPPORT					
COBOL	Yes	No	No	No	No
RPG	No	Yes	Yes	Yes	Yes
FORTRAN	No	No	No	No	No
BASIC	No	Yes	Yes	Yes	Yes
Assembler	No	Yes	Yes	Yes	Yes
Other programming languages	No	Databus, Scribe	Databus, Scribe	Databus, Datashare	Databus, Datashare
Multiprogramming	Yes	No	No	No	No
Language implemented in firmware	No	No	No	No	No
Operating system implemented in firmware	No	No	No	No	No
General accounting packages	No	No	Yes	Yes	Yes
Industry application areas	—	—	Banking, insur., govt., acctg.	Banking, insur., govt., pub. acctg.	Banking, insur., govt., pub. acctg.
Data base management system	No	No	No	No	No
File access methods supported	Sequential, random, ISAM	Sequential	Random, sequential, index seq.	Seq., random, ISAM	Seq., random, ISAM
Software separately priced	No	Yes	Yes	Yes	Yes
Technical help separately priced	No	No	No	No	No
PRICING & AVAILABILITY					
Purchase price of basic system, $	$46,240	$7,200	$12,880	$14,480	$15,980
Monthly rental of basic system, $	$1,041	$165 (2-yr. lease)	$214 (2-yr. lease)	$344 (2-yr. lease)	$384 (2-yr. lease)
Date of first U.S. delivery	September 1977	January 1974	February 1975	January 1977	July 15
Number installed in U.S. to date	NA	3500	2500	NA	NA
COMMENTS	Interactive COBOL; up to 9 terminals; multiterminal control & built-in screen handlers	Dataform and Datashare program languages are also supported	Dataform, Datashare, and RPG II program languages are also supported	Under Databus/ Multilink, system can run 2 programs without partitioning	Under Datashare, system can run 4 programs without partitioning

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Datapoint 2200	Datapoint 5500	Datapoint 6600	Decision Data Computer Corp. System/4	Design Data ECS 40
DATA FORMATS					
Word length, bits	8-bit byte	8-bit byte	8-bit byte	8-bit byte	16
Decimal digits per word	1 per byte	1 per byte	1 per byte	2 per byte	2
Bytes (characters) per word	1 per byte	1 per byte	1 per byte	1 per byte	2
Operand length, words	1 byte	1 byte	1 byte	1 byte	1
Instruction length, words	1-3 bytes	1-4 bytes	1-4 bytes	2-4 bytes	1
CPU					
Model	Datapoint 2200	Datapoint 5500	Datapoint 6600	System/4	DG Nova 3/12
Add time, microseconds	4.8	1.4	1.15	—	0.95; 0.7
No. of programmable registers	14	16	16	6	8
No. of I/O ports on basic system and maximum	4	16	24	5.8	64
INTERNAL STORAGE					
Type	MOS	MOS	MOS	MOS	Core; MOS
Capacity of basic system, bytes	4K	48K	120K (user)	32K	32K
Maximum capacity, bytes	16K	48K	120K (user)	64K	96K
Increment size, bytes	4K	None	None	16K	32K
Cycle time, microseconds	1.6	0.8	0.6	1.0	1.0; 0.7
Access time, microseconds	0.6	0.3	0.2	0.5	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Opt.; 1M bytes	Opt.; 1M bytes	Opt.; 1M bytes	Std.; 2M bytes	Std.; 1.2M bytes
Cartridge disk drive	Opt.; 9.6M bytes	Opt.; 160M bytes	Opt.; 160M bytes	Opt.; 40M bytes	Opt.; 10M bytes
Pack disk drive	Opt.; 50M bytes	Opt.; 200M bytes	Opt.; 200M bytes	No	Opt.; 92M bytes
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	Standard	Standard	No
Full accounting keyboard	No	No	No	Standard	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	No	No	No	Std.; 400 cps
Paper tape punch	No	No	No	No	Opt.; 62.2 cps
Punched card reader	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300-1200	Optional
Punched card punch	No	No	No	No	No
Punched card reader/punch	No	No	No	Opt.; 300/120 cpm	No
Serial printer	Opt.; 120 lpm	Opt.; 120 lpm	Opt.; 80/120 cps	Std.; 120 cps	Std.; 165 cps
Line printer	Opt.; 300, 600 lpm	Opt.; 300, 600 lpm	Opt.; 300, 600 lpm	Opt.; 300/600 lpm	Opt.; to 1200 lpm
Reel-to-reel tape drive	Opt.; 9.6-20 KBS	Opt.; 9.6-20 KBS	Opt.; to 1600 bsi	No	Optional
Cassette tape drive	Std.; 352 cps	Std.; 352 cps	Std.; 352 cps	No	Optional
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Standard; 12 x 80 char.	Standard; 12 x 80 char.	Std.; 12 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 90 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	4	16	25	2	32
Synchronous	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Std.; to 9600 bps	Optional
Asynchronous	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Standard
Protocols supported	IBM 2265, 2741, 2780/3780, HASP	IBM 2265, 2741, 2780/2780, HASP	IBM, Burroughs, CDC, HIS, Univac	IBM 2780/3780	IBM 2780/3780
SOFTWARE SUPPORT					
COBOL	No	Yes	Yes	No	Yes
RPG	Yes	Yes	Yes	Yes	No
FORTRAN	No	No	No	No	Yes
BASIC	Yes	Yes	Yes	No	Yes
Assembler	Yes	Yes	Yes	No	Yes
Other programming languages	Databus, Scribe	Databus, Scribe	Databus, Datashare	Ideal	ALGOL
Multiprogramming	No	Yes, 2 partitions	Yes, 2 partitions	Yes; 2 partitions	Yes; 2 partitions
Language implemented in firmware	No	No	No	No	No
Operating system implemented in firmware	No	No	No	Partially	No
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Banking, insur., gov't., acct'g.	Banking, insur., gov't., acct'g.	Banking, insur., gov't., acct'g.	Distribution	Manufacturing, order entry
Data base management system	No	No	No	No	No
File access methods supported	Random, sequential, index seq.	Random, sequential, index seq.	Seq., random, ISAM	Direct, sequential, index seq.	Index sequential
Software separately priced	Yes	Yes	Yes	Some	Yes
Technical help separately priced	No	No	No	Some	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$8,571	$33,888	$32,500	$20,000	$40,000
Monthly rental of basic system, $	$216 (2-yr. lease)	$855 (2-yr. lease)	$975 (2-yr. lease)	NA	Purchase only
Date of first U.S. delivery	April 1972	1975	July 1, 1977	July 1975	May 1977
Number installed in U.S. to date	9000	500	NA	15	15
COMMENTS	Dataform, Datashare, and RPG II program languages are also supported	Dataform, Datashare, and RPG II program languages are also supported	Under Datashare, system can run 24 programs without partitioning		

*''Std.'' means the device is included in the price of the ''basic system'' as listed here.

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MANUFACTURER & MODEL	Design Data EC330	Digital Computer Controls Synergist Model 1500	Digital Computer Controls Synergist Model 2500	Digital Computer Controls Synergist Model 3700	Digital Equipment Corp. Datasystem 310
DATA FORMATS					
Word length, bits	16	16	16	16	12
Decimal digits per word	2	5	5	5	2
Bytes (characters) per word	2	2	2	2	2 (6-bit)
Operand length, words	1	1	1	1	1
Instruction length, words	1	1	1	1	1
CPU					
Model	DG Eclipse C/300	DG MicroNova	DG Nova 3/12	DG Nova 3/D	DEC PDP-8/A
Add time, microseconds	2.4	2.4	1 msec.	1 nsec.	1000 (15 digits)
No. of programmable registers	12	4	4	4	8 + 8 in mem.
No. of I/O ports on basic system and maximum	64	1-3	1-8	1-16	2, 12
INTERNAL STORAGE					
Type	Core	MOS	Core	Core	Core
Capacity of basic system, bytes	96K	48K	64K	128K	16K (6-bit)
Maximum capacity, bytes	256K	64K	64K	256K	64K (6-bit)
Increment size, bytes	16K	8K, 16K	8K, 16K, 32K	8K, 16K, 32K	16K, 32K (6-bit)
Cycle time, microseconds	0.8	0.96	1.0	1.0	1.4
Access time, microseconds	0.4	0.16	1.0	1.0	0.7
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	Std.; 1.26M bytes	No	No	Std.; 670K bytes
Cartridge disk drive	Opt.; 10M bytes	No	Std.; 10M bytes	Std.; 10M bytes	Opt.; 12.8M bytes
Pack disk drive	Opt.; 92M bytes	No	Opt.; 96-192M bytes	Opt.; 96-192M bytes	No
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	No	Standard	Standard	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 400 cps	Opt.; 400 cps	Opt.; 400 cps	Opt.; 400 cps	No
Paper tape punch	Opt.; 62.2 cps	Opt.; 63 cps	Opt.; 63 cps	Opt.; 63 cps	No
Punched card reader	Optional	Opt.; 400-1000 cpm	Opt.; 400-1000 cpm	Opt.; 400-100 cpm	No
Punched card punch	No	No	No	No	No
Punched card reader/punch	No	No	No	No	No
Serial printer	Std.; 165 cps	Std.; 30 cps	Std.; 275 cps	No	Opt.; 30, 165 cps
Line printer	Opt.; to 1200 lpm	No	Opt.; 300, 600 lpm	Std.; 300 lpm	Opt.; 300 lpm
Reel-to-reel tape drive	Standard	Opt.; 60, 72 KCS	Opt.; 60, 72 KCS	Opt.; 60, 72 KCS	No
Cassette tape drive	Optional	No	No	No	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Standard; 22 x 90 char.	Opt.; 1920 char.	Std.; 1920 char.	Std.; 1920 char.	Optional; 12 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	256	16	16	16	1
Synchronous	Optional	Optional	Optional	Optional	Opt.; to 4800 bps
Asynchronous	Standard	Optional	Optional	Optional	No
Protocols supported	IBM 2780/3780, HASP	No	IBM 2780/3780	IBM 2780/3780	IBM 2780
SOFTWARE SUPPORT					
COBOL	Yes	No	No	No	No
RPG	Yes	No	No	No	No
FORTRAN	Yes	No	No	No	No
BASIC	Yes	Yes	Yes	Yes	No
Assembler	Yes	Yes	Yes	Yes	No
Other programming languages	ALGOL	No	No	No	DIBOL (COBOL)
Multiprogramming	Yes; 2 partitions	No	No	No	No
Language implemented in firmware	No	No	No	No	No
Operating system implemented in firmware	No	No	No	No	No
General accounting packages	Yes	Yes	Yes	Yes	No
Industry application areas	Manufacturing, order entry	Manufacturing, wholesale distr.	Manfacturing, wholesale distr.	Manufacturing, wholesale distr.	Business accounting
Data base management system	Yes	No	No	No	No
File access methods supported	Random, sequential, index seq.	Sequential, random, index sequential	Sequential, random, index sequential	Sequential, random, index sequential	Sequential, index sequential
Software separately priced	Yes	Yes	Yes	Yes	No
Technical help separately priced	Yes	No	No	No	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$60,000	$8,000	$27,000	$40,000	$14,095
Monthly rental of basic system, $	Purchase only	NA	NA	NA	Purchase only
Date of first U.S. delivery	November 1975	January 1977	December 1976	January 1977	May 1975
Number installed in U.S. to date	5	10	40	10	NA
COMMENTS		1-, 2-, and 3-user versions of Synergist are available	Supports "logi-safe" application library including EIS, an executive inquiry system	Supports "logi-safe" application library including EIS, an executive inquiry system	Bytes are 6 bits

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Digital Equipment Corp. Datasystem 322	Digital Equipment Corp. Datasystem 324	Digital Equipment Corp. Datasystem 354	Digital Equipment Corp. Datasystem 357	Digital Equipment Corp. Datasystem 530
DATA FORMATS					
Word length, bits	16	16	16	16	16
Decimal digits per word	2	2	2	2	2
Bytes (characters) per word	2	2	2	2	2
Operand length, words	1	1	1	1	½, 1, 2
Instruction length, words	1, 2, 3	1, 2, 3	1, 2, 3	1, 2, 3	1
CPU					
Model	DEC LSI-11	DEC LSI-11	DEC PDP-11/34	DEC PDP-11/34	DEC PDP-11/34
Add time, microseconds	1.07 (word)	7.3 (word)	1.07 (word)	1.07 (word)	7.3 (word)
No. of programmable registers	8	8	9	9	7
No. of I/O ports on basic system and maximum	4	4	15	15	2, 10
INTERNAL STORAGE					
Type	MOS	MOS	MOS	MOS	MOS
Capacity of basic system, bytes	32K	32K	32K	64K	64K
Maximum capacity, bytes	56K	56K	248K	248K	-256K
Increment size, bytes	8K	8K	32K	32K	-64K
Cycle time, microseconds	1.2	0.7	0.7	0.7	0.7 (w/parity)
Access time, microseconds	0.7	0.7	0.7	0.7	0.7 (w/parity)
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Std.; 1M bytes	Std.; 7.2M bytes	Opt.; 512K bytes	Opt.; 512K bytes	No
Cartridge disk drive	Opt.; 19.2M bytes	Opt.; 19.2M bytes	Std.; 19.2M bytes	Std.; 112M bytes	Std.; 7.2M bytes
Pack disk drive	No	No	No	No	Opt.; 704M bytes
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	Standard	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	No	No	No	No
Paper tape punch	No	No	No	No	No
Punched card reader	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm
Punched card punch	No	No	No	No	No
Punched card reader/punch	No	No	No	No	No
Serial printer	Opt.; 30, 180 cps	Opt.; 30, 180 cps	Opt.; 30, 180 cps	Opt.; 30, 180 cps	Std.; 30, 180 cps
Line printer	Opt.; 240, 300 lpm	Opt.; 240, 300 lpm	Opt.; 240, 300 lpm	Opt. 240, 300 lpm	Opt.; 860-1200 lpm
Reel-to-reel tape drive	Opt.; 10 KBS	Opt.; 10 KBS	Opt.; 10 KBS	Opt.; 10 KBS	Opt.; 10-72 KBS
Cassette tape drive	No	No	No	No	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Opt.; 24 x 80 char.; EIA inter.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	4	4	8	8	32 EIA; 20 ma
Synchronous	Opt.; to 4800 bps	Opt.; to 4800 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 50K bps
Asynchronous	No	No	No	No	Opt.; to 9600 bps
Protocols supported	IBM 2780	IBM 2780	IBM 2780	IBM 2780	2780/3780, 3271, SDLC, DDCMP
SOFTWARE SUPPORT					
COBOL	No	No	No	No	Yes
RPG	No	No	No	No	Yes
FORTRAN	No	No	No	No	Yes
BASIC	No	No	No	No	Yes
Assembler	No	No	No	No	Yes, and macro
Other programming languages	DIBOL (COBOL)	DIBOL (COBOL)	DIBOL (COBOL)	DIBOL (COBOL)	APL, DIBOL
Multiprogramming	No	No	No	No	Yes; 32 partitions
Language implemented in firmware	·No	No	No	No	No
Operating system implemented in firmware	No	No	No	No	No
General accounting packages	No	No	No	,No	No
Industry application areas	Business accounting	Business accounting	Business accounting	Business accounting	Business acctg. and data proc.
Data base management system	No	No	No	No	No
File access methods supported	Sequential, index sequential	Sequential, index sequential	Sequential, index sequential	Sequential, index sequential	Direct, seq., index seq.
Software separately priced	No	No	No	No	See comments
Technical help separately priced	Yes	Yes	Yes	Yes	See comments
PRICING & AVAILABILITY					
Purchase price of basic system, $	$19,315	$32,615	$37,950	$51,170	$35,000
Monthly rental of basic system, $	Purchase only	Purchase only	Purchase only	Purchase only	Special arrangements
Date of first U.S. delivery	March 1977	March 1977	July 1975	July 1975	October 1976
Number installed in U.S. to date	NA	NA	600	600	NA
COMMENTS					Replaces Datasystems based on PDP-11/40 and 11/45; optional bundled software and support.

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Digital Equipment Corp. Datasystem 570	Digital Scientific Corporation Meta 4/1130	Digital Scientific Corporation Meta 4/VM2-TS0	Digital Scientific Corporation Meta 4/1800	Digital Systems Galaxy/5 Model 130
DATA FORMATS					
Word length, bits	16	16 (+2 parity)	16 (+2 parity)	16 (+2 parity)	8
Decimal digits per word	2	5	5	5	1 per byte
Bytes (characters) per word	2	2	2	2	1 per byte
Operand length, words	½, 1, 2	1-2	1-2	1-2	1-256 bytes
Instruction length, words	1	1-2	1-2	1-2	2, 4, 6 bytes
CPU					
Model	DEC PDP-11 70	DSC 4030	DSC 4031	DSC 4040	Galaxy/5
Add time, microseconds	2 7 (word)	2 9 (5 digits)	2 9 (5 digits)	2.9 (5 digits)	5 (5 digits)
No. of programmable registers	10	5	5	5	8-20
No. of I/O ports on basic system and maximum	10 & high speed	4	4	4	15-60
INTERNAL STORAGE					
Type	Core	Core	Core	Core	MOS
Capacity of basic system, bytes	128K	16K	16K	16K	64K
Maximum capacity, bytes	2048K	128K	128K	256K	1M
Increment size, bytes	64K	16K	16K	16K	64K
Cycle time, microseconds	1.0 (w/parity)	0.9	0.9	0.9	0.75
Access time, microseconds	0.5 (w/parity)	0.5	0.5	0 5	0 50
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	No	No	See comments
Cartridge disk drive	Opt.; 14-28M bytes	Opt.; 5.12M bytes	Opt.; 5.12M bytes	Opt.; 5.12M bytes	See comments
Pack disk drive	Std.; 88M bytes	Opt.; 160M bytes	Opt.; 160M bytes	Opt.; 160M bytes	Std.; 32-240M bytes
Fixed-head disk/drum	Opt.; 8M bytes	No	Opt.; 1-2M bytes	No	24M bytes
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Yes
10-key numeric keyboard	Standard	No	No	No	Yes
Full accounting keyboard	No	No	No	No	Yes
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	Opt.; 400 cps	Opt.; 400 cps	Opt.; 400 cps	See comments
Paper tape punch	No	Opt.; 50 cps	Opt.; 50 cps	Opt.; 50 cps	See comments
Punched card reader	Opt.; 300 cpm	Opt.; 600, 1000	Opt.; 600, 1000	Opt.; 600, 1000	Yes
Punched card punch	No	Opt.; 35, 160 cpm	Opt.; 35, 160 cpm	Opt.; 35, 160 cpm	See comments
Punched card reader/punch	No	Opt.; 400/160 cpm	Opt.; 400/160 cpm	Opt.; 400/160 cpm	See comments
Serial printer	Std.; 30, 180 cps	No	No	No	See comments
Line printer	Opt.; 860-1200 lpm	Opt.; 300, 600 lpm	Opt.; 300, 600 lpm	Opt.; 300, 600 lpm	Std.; 100-900 lpm
Reel-to-reel tape drive	Opt.; 10-72 KBS	Opt.; 30, 60 KBS	Opt.; 30, 60 KBS	Opt.; 30, 60 KBS	Yes
Cassette tape drive	No	No	No	No	See comments
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Opt.; 24 x 80 char.; EIA int.	No	No	No	Standard; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	63 EIA; 20 ma	32	32	2	120
Synchronous	Opt.; to 50K bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Std.; to 15,000 bps
Asynchronous	Opt.; to 9600 bps	Opt.; 50-19.2K bps	Opt.; 50-19.2K bps	No	Std.; to 9600 bps
Protocols supported	2780/3780, 3271, SDLC, DDCMP	IBM 2780/3780, BSC	IBM 2780/3780, BSC	IBM 2780/3780, BSC	Programmable
SOFTWARE SUPPORT					
COBOL	Yes	Yes	Yes	No	No
RPG	Yes	Yes	Yes	No	Yes
FORTRAN	Yes	Yes	Yes	Yes	Yes (early 1978)
BASIC	Yes	No	Yes	No	Yes
Assembler	Yes, and macro	Yes, and macro	Yes, and macro	Yes, and macro	Yes
Other programming languages	APL, DIBOL	None	APL, S/1	None	LMP, FMP
Multiprogramming	Yes; 63 partitions	No	Yes; 32 partitions	Yes; 24 partitions	Yes
Language implemented in firmware	No	Partially	Partially	Partially	No
Operating system implemented in firmware	No	No	No		Partially
General accounting packages	No	Yes	Yes	No	Yes
Industry application areas	Business acctg. and data proc.	Mktg. research, civil eng., educ.	Mktg. research, civil eng., educ.	Med., process ctl., eng., research	Most industries
Data base management system	DBMS-11	Yes	Yes	No	Yes
File access methods supported	Direct, seq. index seq.	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index seq.
Software separately priced	See comments	Yes	Yes	No	Yes
Technical help separately priced	See comments	No	No	No	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$108,000	$60,000	$100,000	$80,000	$32,700 (CPU only)
Monthly rental of basic system, $	Special arrangements	$1,500	2,300	$1,850	$752 (CPU only)
Date of first U.S. delivery	May 1976	1970	1974	1971	December 1975
Number installed in U.S. to date	NA	Over 200	See Meta 4/1130	Over 30	8
COMMENTS	High-speed controllers and dual-access disks avail.; optional bundled software and support	Can run most IBM 1130/1180 programs; firmware arithmetic unit is optional	Can run most IBM 1130/1800 programs; firmware arithmetic unit is optional; time-share, conversational operating system	Can run most IBM 1130/1800 programs; digital/analog I/O; real-time, batch, time-share OS	Nonstd. peripherals are not sold by DSC but may be connected thru comm. port; lease is 5-yr. full-payout with purchase

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Digital Systems Galaxy/5 Model 140	Digital Systems Galaxy/5 Model 150	Dimis Inc. Total 100	Display Data Corporation In*Sight	Distribution Management Systems DMS-1000-8
DATA FORMATS					
Word length, bits	8	8	16	8	12
Decimal digits per word	1 per byte	1 per byte	4	2	2
Bytes (characters) per word	1 per byte	1 per byte	4	1	2
Operand length, words	1-256 bytes	1-256 bytes	4	to 4	1
Instruction length, words	2, 4, 6	2, 4, 6	1	1-5	1, 2
CPU					
Model	Galaxy/5	Galaxy/5	Modcomp II	Microdata 1600/30	DEC PDP-8
Add time, microseconds	5 (5 digits)	5 (5 digits)	0.8	4.6	3.0 (word)
No. of programmable registers	8-20	8-20	15	3	8+8 in memory
No. of I/O ports on basic system and maximum	15-60	15-60	2; 8	2; 20	2-10
INTERNAL STORAGE					
Type	MOS	MOS	Core	Core	Core
Capacity of basic system, bytes	128K	256K	128K	32K	32K (6-bit)
Maximum capacity, bytes	1M	1M	128K	64K	32K
Increment size, bytes	64K	64K	None	8K-16K	16K
Cycle time, microseconds	0.75	0.75	0.80	1.00	1.2-1.5
Access time, microseconds	0.50	0.50	0.50	0.35	0.75
MASS STORAGE CAPABILITIES*					
Floppy disk drive	See comments	See comments	Optional	No	No
Cartridge disk drive	See comments	See comments	Optional	Std.; 80M bytes	Std.; 6.4-25.6M bytes
Pack disk drive	Std.; 32-240M bytes	Std.; 32-240M bytes	Std.; 700M bytes	No	No
Fixed-head disk/drum	24M bytes	24M bytes	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Yes	Yes	Optional	Standard	Standard
10-key numeric keyboard	Yes	Yes	Optional	Standard	Standard
Full accounting keyboard	Yes	Yes	Optional	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	See comments	See comments	Optional	No	No
Paper tape punch	See comments	See comments	Optional	No	No
Punched card reader	Yes	Yes	Optional	No	No
Punched card punch	See comments	See comments	Optional	No	No
Punched card reader/punch	See comments	See comments	Optional	No	No
Serial printer	See comments	See comments	Optional	Std.; 120 cps	Std.; 180 cps
Line printer	Std.; 100-900 lpm	Std.; 100-900 lpm	Std.; 300 lpm	Opt.; 300-600 lpm	Opt.; 300 lpm
Reel-to-reel tape drive	Yes	Yes	Std.; 36 KBS	Opt.; 10, 20 KBS	Opt.; 36 KBS
Cassette tape drive	See comments	See comments	No	No	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 1920 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	240	480	32	16	10
Synchronous	Std.; to 15,000 bps	Std.; to 15,000 bps	Optional	No	Opt.; to 50 K bps
Asynchronous	Std.; to 9600 bps	Std.; to 9600 bps	Std.; to 9600 bps	Std.; to 9600 bps	Opt.; to 9600 bps
Protocols supported	Programmable	Programmable	None	None	IBM 2780/3780 HASP
SOFTWARE SUPPORT					
COBOL	No	No	No	No	No
RPG	Yes	Yes (late 1976)	No	No	No
FORTRAN	Yes (early 1978)	Yes (early 1978)	Yes	No	No
BASIC	Yes	Yes	No	No	No
Assembler	Yes	Yes	Yes	Yes	Yes
Other programming languages	LMP, FMP	LMP, FMP	None	None	DEAL, ORACLE
Multiprogramming	Yes	Yes	Yes	Yes; 20 partition	Yes; 10 partitions
Language implemented in firmware	No	No	No	Fully	No
Operating system implemented in firmware	Partially	Partially	No	No	No
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Most industries	Most industries	Distribution	Auto dlrs., contrac- tors, whlslrs.	Distribution
Data base management system	Yes	Yes	Yes	No	Yes
File access methods supported	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index seq.	Sequential, random, index seq.	Index sequential, sequential, random
Software separately priced	Yes	Yes	No	Yes	Yes
Technical help separately priced	Yes	Yes	Yes	No	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$60,800 (CPU only)	$108,400 (CPU only)	$135,000	$37,700	$54,000
Monthly rental of basic system, $	$1,400 (CPU only)	$3,500 (CPU only)	NA	NA	Purchase only
Date of first U.S. delivery	October 1976	October 1976	June 1974	January 1974	1970
Number installed in U.S. to date	3	NA	3	180	43
COMMENTS	Dual-processor system	Three-processor system	3 CRT's standard; package includes staff & mgmt. train- ing & conversion support	Specialists in complete turnkey systems, support, forms, & mainte- nance for selected businesses	

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Distribution Management Systems DMS-1000-11	Educomp-Quodata E-100	Educomp-Quodata E-500	Educomp-Quodata E-600	Educomp-Quodata E-700
DATA FORMATS					
Word length, bits	16	12	12	16	16
Decimal digits per word	2	4	3	4	4
Bytes (characters) per word	2	2	2	2	2
Operand length, words	½, 1, 2	1	—	1, 2	—
Instruction length, words	1, 2, 3	1	1	1	1 or 2 or 3
CPU					
Model	DEC PDP-11	DEC PDP-8A	DEC PDP-8/A	DEC PDP-11/34	DEC PDP-11/34
Add time, microseconds	0.3-3.17 (word)	3.0	2.6	3.0	2.16
No. of programmable registers	9-47	6 + 8 in mem.	1	8	8
No. of I/O ports on basic system and maximum	7-50	3; 7	—	4; 6	—
INTERNAL STORAGE					
Type	Core; MOS	Core	Core or MOS	Core	MOS
Capacity of basic system, bytes	64K	64K (6-bit)	64K	32K	128K
Maximum capacity, bytes	248K-2048K	64K (6-bit)	256K	256K	248K
Increment size, bytes	8K-64K	None	32K	32K	32K
Cycle time, microseconds	0.980	1.2, 1.5	1.2	0.9	0.775
Access time, microseconds	0.490	0.6, 0.75	1.2	0.45	0.635
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Opt.; 512K bytes	Std.; 500K bytes	Optional	Optional	Optional
Cartridge disk drive	Opt.; 20M bytes	Optional	Std.; 64M bytes	Standard	Optional
Pack disk drive	Std.; 28-1200M bytes	Optional	No	Optional	Std.; 20M bytes
Fixed-head disk/drum	Opt.; 8M bytes	Optional	No	Optional	Optional
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Optional	Standard	Optional	Standard
Full accounting keyboard	No	No		No	
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	Optional	Optional	Optional	Optional
Paper tape punch	No	Optional	Optional	Optional	Optional
Punched card reader	No	Optional	Optional	Optional	Optional
Punched card punch	No	Optional	Optional	Optional	Optional
Punched card reader/punch	No	Optional	Optional	Optional	Optional
Serial printer	Std.; 180 cps	Optional	Opt.; 180 cps	Optional	Opt.; 180 cps
Line printer	Opt.; 60-1200 lpm	Optional	Opt.; 300-900 lpm	Optional	Opt.; 300-900 lpm
Reel-to-reel tape drive	Opt.; 36-120 KBS	Optional	No	Optional	Standard
Cassette tape drive	No	Optional	No	Optional	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Std.; 1920 char.	Optional; 24 x 80 char.	Opt.; 1920 char.	Optional; 24 x 80 char.	Opt.; 1920 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	32	16	32	32	63
Synchronous	Opt.; to 50K bps	Optional	Optional	Optional	Optional
Asynchronous	Opt.; to 9600 bps	Standard	Std.; to 19.2K bps	Standard	Std.; to 9600 bps
Protocols supported	IBM 2780/3780, HASP, SDLC	IBM 2780/3780, SDLC, etc.	IBM 2780, DDCMP	IBM 2780/3780, SDLC, etc.	IBM 2780, DDCMP
SOFTWARE SUPPORT					
COBOL	Yes	Yes	Yes (subset)	Yes	Yes
RPG	No	No	No	Yes	Yes
FORTRAN	Yes	Yes	Yes	Yes	Yes
BASIC	Yes	Yes	Yes	Yes	Yes
Assembler	Yes	Yes	Yes	Yes	Yes
Other programming languages	DEAL; ORACLE	FOCAL	DIBOL	FOCAL	APL, PASCAL; DIBOL
Multiprogramming	Yes; 30 partitions	Yes	Yes; 63 partitions	Yes	Yes; 63 partitions
Language implemented in firmware	No	No	No	No	No
Operating system implemented in firmware	No	Partially	Partially	No	No
General accounting packages	Yes	No	No	Yes	Yes
Industry application areas	Distribution	Education, municipal government	General	Education, municipal government	Education & government
Data base management system	Yes	No	No	Yes	Yes
File access methods supported	Indexed sequential, sequential, random	Random, sequential, index sequential	Sequential, random	Random, sequential, index seq.	Sequential, random, index sequential
Software separately priced	Yes	Yes	Yes	Yes	Yes
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$65,000	$6,000 to $40,000	$33,000	$45,000	$65,000
Monthly rental of basic system, $	Purchase only	NA	—	NA	—
Date of first U.S. delivery	NA	1971	1974	1972	1973
Number installed in U.S. to date	NA	NA	100+	NA	100+
COMMENTS		Complete administrative and instructional systems built to customer spec's		Complete administrative and instructional systems built to customer spec's	Software systems specifically designed for educational institutions and government entities

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Educomp-Quodata E-940	Financial Computer Fedder System III/10	Financial Computer Fedder System III/6	Four-Phase Systems Inc. System IV/40	Four-Phase Systems Inc. System IV/50
DATA FORMATS					
Word length, bits	16 or 32	8-bit byte	8-bit byte	24	24
Decimal digits per word	4 or 8	2 per byte	2 per byte	—	—
Bytes (characters) per word	2 or 4	1 per byte	1 per byte	3	3
Operand length, words	—	1 byte	1 byte	15 bits	15 bits
Instruction length, words	1 or 2 or 3	1 byte	1 byte	1	1
CPU					
Model	DEC PDP-11/70	Fedder S III	Fedder S III	Four-Phase	Four-Phase
Add time, microseconds	Variable	—	—	16 (word)	16 (word)
No. of programmable registers	16	256	256	5	5
No. of I/O ports on basic system and maximum	—	5; 64	5; 64	34	29
INTERNAL STORAGE					
Type	Core	MOS	MOS	MOS	MOS
Capacity of basic system, bytes	Cache plus 256K	32K	32K	24K	24K
Maximum capacity, bytes	2 million	256K	256K	72K	96K
Increment size, bytes	64K	8, 16, 32K	8, 16, 32K	24K	12K, 24K
Cycle time, microseconds	Variable	—	—	2	2
Access time, microseconds	Variable	—	—	—	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Optional	Opt.; 2.4M bytes	Std.; 1.8 bytes	Opt.; 354K bytes	Std.; 354K bytes
Cartridge disk drive	Optional	Std.; 10.6M bytes	Opt.; 10.6M bytes	Std.; 10M bytes	Std.; 10M bytes
Pack disk drive	Std.; 88M bytes	No	No	No	Opt.; 270M bytes
Fixed-head disk/drum	Optional	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	Standard	Standard	Standard
Full accounting keyboard		No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Optional	Opt.; 300, 1000 cps	Opt.; 300, 1000 cps	No	No
Paper tape punch	Optional	Opt.; 300, 1000 cps	Opt.; 300, 1000 cps	No	No
Punched card reader	Optional	Opt.; 300, 600 cpm	Opt.; 300, 600 cpm	Opt.; 300, 600 cpm	Opt.; 300, 600 cpm
Punched card punch	Optional	Opt.; 300 cpm	Opt.; 300 cpm	No	No
Punched card reader/punch	Optional	No	No	No	No
Serial printer	Opt.; 180 cpm	Std.; 200 cps	Opt.; 30 cps	Opt.; 30 cps	Opt.; 30 cps
Line printer	Opt.; 300-900 lpm	Opt.; 300-1250 lpm	Opt.; 300-1250 lpm	Opt.; 245-700 lpm	Opt.; 245-700 lpm
Reel-to-reel tape drive	Standard	Opt.; 72 KBS	Opt.; 72 KBS	No	No
Cassette tape drive	No	Optional	Optional	No	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Opt.; 1920 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	63	64	64	—	—
Synchronous	Optional	Opt.; to 9600 bps	Opt.; to 9600 bps	Std.; to 9600 bps	Std.; to 9600 bps
Asynchronous	Std.; to 9600 bps	Std.; to 9600 bps	Std.; to 9600 bps	Opt.; to 2400 bps	Opt.; to 2400 bps
Protocols supported	IBM 2780, DDCMP	None	None	IBM 3270, 2780, 3780	IBM 3270, 2780, 3780, bisync
SOFTWARE SUPPORT					
COBOL	Yes	No	No	No; comp. on IV/70	Yes
RPG	Yes	No	No	No; comp. on IV/70	No
FORTRAN	Yes	No	No	No	No
BASIC	Yes	Yes	Yes	No	No
Assembler	Yes	Yes	Yes	Yes	Yes
Other programming languages	APL, PASCAL, DIBOL	CPL, PL/X	CPL, PL/X	None	None
Multiprogramming	Yes; 63 partitions	Yes; 32 partitions	Yes; 32 partitions	No	No
Language implemented in firmware	No	No	No	—	—
Operating system implemented in firmware	No	Partially	Partially	—	—
General accounting packages	Yes	Yes	Yes	No	No
Industry application areas	Education & government	Dist., manuf., construct., acctg.	Dist., manuf., construct., acctg.	Mfg., insurance, education	Mfg., insurance, education
Data base management system	Yes	Yes	Yes	No	No
File access methods supported	Sequential, random, index sequential	Random, sequential, index sequential	Random, sequential, index sequential	Contig., chained, seq., rand., ind. seq.	Contig., chained, seq., rand., ind. seq.
Software separately priced	Yes	Yes	Yes	No	No
Technical help separately priced	Yes	Yes	Yes	—	—
PRICING & AVAILABILITY					
Purchase price of basic system, $	$142,000	$37,500	$22,950	$30,315	$69,330
Monthly rental of basic system, $	—	$750	$460	$604	$1,335 (42-mo. lease)
Date of first U.S. delivery	1975	January 1975	April 1977	June 1973	4th quarter 1976
Number installed in U.S. to date	—	150	20	2300+ (IV/40, 70)	NA
COMMENTS	Software systems specifically designed for educational institutions and government entities	Can run interactive or batch in any partitions; Fedder Data Systems is a division of Financial Computer Corp.		4 CRT's & 2.5M-byte cartridge disk are standard; applications in data entry & network transaction processing	12 CRT's and 10M-byte cartridge disk are standard; applications in data entry & network transaction processing

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Four-Phase Systems Inc. System IV/70	General Automation 440 Data Series	General Automation DM-130/2	General Automation DM-130	General Automation DM-140
DATA FORMATS					
Word length, bits	24	18	16	16	16
Decimal digits per word	—	4	4	4	4
Bytes (characters) per word	3	2	2	2	2
Operand length, words	15 bits	1	1, 2	1, 2	1, 2
Instruction length, words	1	1, 2	1	1	1
CPU					
Model	Four-Phase	GA-16/440	GA SPC-16/40	GA SPC-16/65	GA SPC-16/65
Add time, microseconds	16 (word)	0.78 (16 bits)	1.44	0.96	0.96
No. of programmable registers	5	16	16	16	16
No. of I/O ports on basic system and maximum	78	1; 128	8	18	18
INTERNAL STORAGE					
Type	MOS	Core	Core	Core	Core
Capacity of basic system, bytes	24K	128K	64K	64K	80K
Maximum capacity, bytes	96K	128K	64K	64K	128K
Increment size, bytes	12K, 24K	—	—	—	4K
Cycle time, microseconds	2	0.72	1.44	0.96	0.96
Access time, microseconds	—	0.25	0.72	0.48	0.48
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Opt.; 354K bytes	No	No	No	No
Cartridge disk drive	Std.; 10M bytes	Std.; 40M bytes	Std.; 20M bytes	Std.; 40M bytes	Std.; 40M bytes
Pack disk drive	Opt.; 270M bytes	Opt.; 2400M bytes	No	Opt.; 200M bytes	Opt.; 200M bytes
Fixed-head disk/drum	No	Opt.; 2M bytes	No	No	Opt.; 512K bytes
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	Standard	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	No	No	No	No
Paper tape punch	No	No	No	No	No
Punched card reader	Opt.; 300, 600 cpm	Opt.; 400, 1000 cpm	Opt.; 400, 1000 cpm	Opt.; 400, 1000 cpm	Opt.; 400, 1000 cpm
Punched card punch	No	No	No	No	Opt.; 35 cpm
Punched card reader/punch	No	No	No	No	No
Serial printer	Opt.; 30 cps	No	Std.; 165 cpm	Std.; 165 cps	Std. (2); 165 cps
Line printer	Opt.; 245-700 lpm	Std.;200,300,600 lpm	200-600 lpm	Std.; 200-600 lpm	Std. (2); to 600 lpm
Reel-to-reel tape drive	Std.; 10, 60 KBS	Opt.; 20, 30, 60 KBS	No	No	Opt.; 30, 60 KBS
Cassette tape drive	No	No	No	No	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Standard; 6 x 48 char.	Std.; 24 x 80 char.	Standard (2); 24 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	—	16	5	5	25
Synchronous	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Asynchronous	Opt.; to 2400 bps	Std.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Protocols supported	IBM 3270, 2260, 2780, 3780	IBM 2780	IBM HASP, 2780	IBM HASP, 2780	IBM HASP, 2780
SOFTWARE SUPPORT					
COBOL	Yes	Yes	No	No	No
RPG	Yes	No	No	No	No
FORTRAN	No	No	Yes	Yes	Yes
BASIC	No	No	No	No	No
Assembler	Yes	No	Yes	Yes	Yes
Other programming languages	None	None	None	None	None
Multiprogramming	No	Yes; 4 partitions	Yes; 4 partitions	Yes; 4 partitions	Yes; 2 partitions
Language implemented in firmware	—	No	No	No	No
Operating system implemented in firmware	—	No	No	No	No
General accounting packages	No	No	Yes	Yes	Yes
Industry application areas	Mfg., insurance, education	Mfg., insurance, dist., medicine	Mfg., insurance, dist., medicine	Mfg., insurance, dist., medicine	Mfg., insurance, dist., medicine
Data base management system	No	No	No	No	No
File access methods supported	Contig., chained, seq.,random,ind.seq.	ISAM, sequential, relative	Index sequential	Index sequential	Index sequential
Software separately priced	No	No	No	No	No
Technical help separately priced	—	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$68,055	$57,566	$35,000	$35,000	$55,000
Monthly rental of basic system, $	$1,432	Purchase only	Purchase only	Purchase only	Purchase only
Date of first U.S. delivery	February 1971	May 1977	January 1974	November 1974	June 1975
Number installed in U.S. to date	2300+ (IV/40, 70)	NA	NA	NA	NA
COMMENTS	12 CRT's and 2.5M-byte cartridge disk are standard; applications in data entry and network transaction processing	Bundled software includes COBOL and full ISAM file management system	Sold as turnkey system by OEM's		

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	General Information Systems ABLE-322	General Information Systems ABLE-322F	General Information Systems ABLE-350	GRI Computer Corp. System 99	Harris Computer Systems S110
DATA FORMATS					
Word length, bits	16	16	16	16	24
Decimal digits per word	4	4	4	4	6
Bytes (characters) per word	2	2	2	2	3
Operand length, words	1	1	1	—	1 or 2
Instruction length, words	1 to 3	1 to 3	1 to 3	1-3	1 or 2
CPU					
Model	DEC PDP-11/03	DEC PDP-11/03	DEC PDP-11/34	GRI 99/50	Harris Series 100
Add time, microseconds	3.1, 6	3.1, 6	3.1, 6	—	0.75 (1 word)
No. of programmable registers	8	8	8	13	5
No. of I/O ports on basic system and maximum	2, 16	2, 16	5, 64	9; 80	3; 12
INTERNAL STORAGE					
Type	MOS	MOS	Core, MOS	Static MOS	Core
Capacity of basic system, bytes	24K	24K	32K	32K	96K
Maximum capacity, bytes	56K	56K	256K	64K	768K
Increment size, bytes	16K	16K	16K	16K/32K	24K or 48K
Cycle time, microseconds	0.72	0.72	0.98	1.76	0.750
Access time, microseconds	0.5	0.5	0.75	0.15	0.300
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Std.; 1024K bytes	Std.; 1024K bytes		No	Opt.; 310K bytes
Cartridge disk drive	Std.; 20M bytes	Std.; 20M bytes	2, 8, 29M bytes	Std.; 6M bytes	Std.; 10.8M bytes
Pack disk drive	—	—	0, 8 160M bytes	No	Opt.; 1200M bytes
Fixed-head disk/drum	—	1, 2, 9.6M bytes	—	No	Opt.; 2.15M bytes
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	Standard	Standard	No
Full accounting keyboard	Standard	Standard	Standard	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 300 cps	Opt.; 300 cps	Opt.; 300 cps	Opt.; 300 cps	Opt.; 300 cps
Paper tape punch	Opt.; 50 cps	Opt.; 50 cps	Opt.; 50 cps	Opt.; 75 cps	Opt.; 75 cps
Punched card reader	Opt.; 300 cps	Opt.; 300 cps	Opt.; 300 cps	Opt.; 300 cpm	Opt.; 1000 cpm
Punched card punch	—	—	—	No	No
Punched card reader/punch	Opt.; 1200 cpm	Opt.; 1200 cpm	Opt.; 1200 cpm	Opt.; 300/120 cpm	Opt.; 500/100 cpm
Serial printer	Std.; 2, 180 cps	Std.; 2, 180 cps	Std.; to 900 cps	Opt.; 100/165 cps	Opt.; 30 cps
Line printer	Opt.; to 1200 lpm	Opt.; to 1200 lpm	Opt.; to 1200 lpm	Opt.; 250/600 cpm	Opt.; 900 lpm
Reel-to-reel tape drive	Opt.; 72K cps	Opt.; 72K cps	Opt.; 72K cps	Opt.; 30K cps	Std.; 36K cps
Cassette tape drive	Opt.; 560 cps	Opt.; 560 cps	Opt.; 560 cps	No	Opt.; 30 cps
Cartridge tape drive	Opt.; 10K cps	Opt.; 10K cps	Opt.; 10K cps	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Std.; 1920 char. per screen	Std.; 1920 char. per screen	Std.; 1920 char. per screen	Std.; 640/1280 char.	Std.; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	16	16	16	3	128
Synchronous	No	No	No	Opt.; 4800 bps	Opt.; to 9.6K bps
Asynchronous	Opt.; to 4800 bps	Opt.; to 4800 bps	Opt.; to 9600 bps	Opt.; 1200 bps	Opt.; to 19.2K bps
Protocols supported	IBM 2780	IBM 2780	IBM 2780	None	IBM 2780, HASP, CDC UT200, Univac 1004
SOFTWARE SUPPORT					
COBOL	Yes	Yes	Yes	No	Yes
RPG	Yes	Yes	Yes	Yes (interactive)	Yes
FORTRAN	Yes	Yes	Yes	No	Yes
BASIC	Yes	Yes	Yes	No	Yes
Assembler	Yes	Yes	Yes	Yes	Yes
Other programming languages	DIBOL	DIBOL	DIBOL	None	SNOBOL, FORGO
Multiprogramming	Yes; 16 partitions	Yes; 16 partitions	Yes; 24 partitions	Yes; 4 partitions	Yes; 256 partitions
Language implemented in firmware	No	No	No	No	No
Operating system implemented in firmware	No	No	No	No	No
General accounting packages	Yes	Yes	Yes	Yes	No
Industry application areas	CPA, mfg., dist., medical, legal	CPA, mfg., dist., medical, legal	CPA, mfg., dist., medical, legal	Mfg., retail, dist., constr., banking	Multi-use and time-sharing
Data base management system	Yes	Yes	Yes	No	Yes
File access methods supported	Sequential, random	Sequential, random	Sequential, random	Sequential, random, indexed sequential	Sequential, random, index sequential
Software separately priced	Yes	Yes	Yes	Applications only	No (see comments)
Technical help separately priced	Yes	Yes	Yes	Yes	No
PRICING & AVAILABILITY					
Purchase price of basic system, $	$24,000	$31,000	$48,000	$33,333	$85,000
Monthly rental of basic system, $	$500	$650	$1,000	Purchase only	3rd-party lease
Date of first U.S. delivery	NA	NA	December 1975	2nd qtr. 1975	1975
Number installed in U.S. to date	NA	NA	4	NA	NA
COMMENTS	Turnkey system; ABLE, a financial control system, costs $6,500; other packages from $1,500 to $3,000	Turnkey system; ABLE, a financial control system, costs $6,500; other packages from $1,500 to $3,000	Turnkey system; ABLE, a financial control system, costs $6,500; other packages from $1,500 to $3,000	Sold through distributor network	Total DBMS and query language priced separately; RJE host and remote

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Harris Computer Systems S115	Harris Computer Systems S120	Harris Computer Systems S125	Harris Computer Systems S130	Harris Computer Systems S135
DATA FORMATS					
Word length, bits	24	24	24	24	24
Decimal digits per word	6	6	6	6	6
Bytes (characters) per word	3	3	3	3	3
Operand length, words	1 or 2	1 or 2	1 or 2	1 or 2	1 or 2
Instruction length, words	1 or 2	1 or 2	1 or 2	1 or 2	1 or 2
CPU					
Model	Harris Series 100 Model 6-5	Harris Series 100	Harris Series 100 Model 6-6	Harris Series 100	Harris Series 100 Model 6-7
Add time, microseconds	0.6 (1 word)	0.75 (1 word)	0.6 (1 word)	0.75 (1 word)	0.6 (1 word)
No. of programmable registers	5	5	5	5	5
No. of I/O ports on basic system and maximum	3; 7	4; 12	3; 24	4; 12	3; 24
INTERNAL STORAGE					
Type	MOS	Core	MOS	Core	MOS
Capacity of basic system, bytes	144K	192K	144K	288K	384K
Maximum capacity, bytes	192K	768K	624K	768K	768K
Increment size, bytes	48K	24K or 48K	48K	24K or 48K	48K
Cycle time, microseconds	0.450	0.750	0.450	0.750	0.450
Access time, microseconds	0.300	0.300	0.300	0.300	0.300
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Opt.; 310K bytes	Opt.; 310K bytes	Opt.; 310K bytes	Opt.; 310K bytes	Opt.; 310K bytes
Cartridge disk drive	Std.; 10.8M bytes	Std.; 10.8M bytes	Std.; 40M bytes	Std.; 40M bytes	Std.; 40M bytes
Pack disk drive	Opt.; 3000M bytes	Opt.; 1200M bytes	Opt.; 3000M bytes	Opt; 1200M bytes	Opt.; 3000M bytes
Fixed-head disk/drum	Opt.; 2.15M bytes	Opt.; 2.15M bytes	Opt.; 2.15M bytes	Opt.; 2.15M bytes	Opt.; 2.15M bytes
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	No	No	No	No	No
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 300 cps	Opt.; 300 cps	Opt.; 300 cps	Opt.; 300 cps	Opt.; 300 cps
Paper tape punch	Opt.; 75 cps	Opt.; 75 cps	Opt.; 75 cps	Opt.; 75 cps	Opt.; 75 cps
Punched card reader	Opt.; 1000 cpm	Std.; 300 cpm	Opt.; 1000 cpm	Std.; 300 cpm	Opt.; 1000 cpm
Punched card punch	No	No	No	No	No
Punched card reader/punch	Opt.; 500/100 cpm	Opt.; 500/100 cpm	Opt.; 500/100 cpm	Opt.; 500/100 cpm	Opt.; 500/100 cpm
Serial printer	Opt.; 30 cps	Opt.; 30 cps	Opt.; 30 cps	Opt.; 30 cps	Opt.; 30 cps
Line printer	Opt.; 900 lpm	Std.; 300 lpm	Opt.; 900 lpm	Std.; 300 lpm	Opt.; 900 lpm
Reel-to-reel tape drive	Std.; 36K cps	Std.; 36K cps	Std.; 36K cps	Std.; 36K cps	Std.; 36K cps
Cassette tape drive	Opt.; 30 cps	Opt.; 30 cps	Opt.; 30 cps	Opt.; 30 cps	Opt.; 30 cps
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Std.; 24 x 80 char.	Std.; 24 x 80 char.	Std.; 24 x 80 char.	Std.; 24 x 80 char.	Std.; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	128	128	128	128	128
Synchronous	Mux. std.; LIU opt.	Opt.; to 9.6K bps	Std.; to 50K bps	Opt.; to 9.6 bps	Std.; to 50K bps
Asynchronous	Mux. std.; LIU opt.	Opt.; to 19.2K bps	Std.; to 19.2K bps	Opt.; to 19.2K bps	Std.; to 19.2K bps
Protocols supported	IBM 2780, HASP, CDC, UT200, Univac 1004	IBM 2780, HASP, CDC UT200, Univac 1004	IBM 2780, HASP, CDC UT200, Univac 1004	IBM 2780, HASP, CDC UT200, Univac 1004	IBM 2780, HASP, CDC UT200, Univac 1004
SOFTWARE SUPPORT					
COBOL	Yes	Yes	Yes	Yes	Yes
RPG	Yes	Yes	Yes	Yes	Yes
FORTRAN	Yes	Yes	Yes	Yes	Yes
BASIC	Yes	Yes	Yes	Yes	Yes
Assembler	Yes	Yes	Yes	Yes	Yes
Other programming languages	SNOBOL, FORGO	SNOBOL, FORGO	SNOBOL, FORGO	SNOBOL, FORGO	SNOBQL, FORGO
Multiprogramming	Yes; 256 partitions	Yes; 256 partitions	Yes; 256 partitions	Yes; 256 partitions	Yes; 256 partitions
Language implemented in firmware	No	No	No	No	No
Operating system implemented in firmware	No	No	No	No	No
General accounting packages	No	No	No	No	No
Industry application areas	Multi-use and time-sharing	Multi-use and time-sharing	Multi-use and time-sharing	Multi-use and time-sharing	Multi-use and time-sharing
Data base management system	Yes	yes	Yes	Yes	Yes
File access methods supported	Sequential, random, index sequential	Sequential, random, index sequential	Sequential, random, index sequential	Sequential, random, index sequential	Sequential, random, index sequential
Software separately priced	No (see comments)	No (see comments)	No (see comments)	No (see comments)	No (see comments)
Technical help separately priced	No	No	No	No	No
PRICING & AVAILABILITY					
Purchase price of basic system, $	$85,000	$125,000	$100,000	$155,000	$150,000
Monthly rental of basic system, $	3rd-party lease	3rd-party lease	3rd-party lease	3rd-party lease	3rd-party lease
Date of first U.S. delivery	1977	1975	1977	1975	1977
Number installed in U.S. to date	NA	NA	NA	NA	NA
COMMENTS	Total DBMS and query language priced separately; RJE host and remote	Total DBMS and query language priced separately; RJE host and remote	Total DBMS and query language priced separately; RJE host and remote	Total DBMS and query language priced separately; RJE host and remote; 40MB disk drive is standard	Total DBMS and query language priced separately; RJE host and remote; 40MB disk drive is standard

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Harris Computer Systems S140	Harris Computer Systems S150	Hewlett-Packard Data Systems Div. 1000 Model 20/21	Hewlett-Packard Data Systems Div. 1000 Model 30/31	Hewlett-Packard Data Systems Div. 1000 Model 80/81
DATA FORMATS					
Word length, bits	24	24	16	16	16
Decimal digits per word	6	6	2	2	2
Bytes (characters) per word	3	3	2	2	2
Operand length, words	1 or 2	1 or 2	1, 2	1, 2	1, 2
Instruction length, words	1 or 2	1 or 2	1, 2, 3	1, 2, 3	1, 2, 3
CPU					
Model	Harris Series 100	Harris Series 100	HP 21MX E	HP 21MX E	HP 21MX E
Add time, microseconds	0.75 (1 word)	0.75 (1 word)	1.12	1.12	1.12
No. of programmable registers	5	5	20	20	20
No. of I/O ports on basic system and maximum	5; 12	5; 12	14; 46	14; 46	14; 46
INTERNAL STORAGE					
Type	Core	Core	MOS	MOS	MOS
Capacity of basic system, bytes	384K	480K	64K	64K	128K
Maximum capacity, bytes	768K	768K	608K	608K	608K
Increment size, bytes	24K or 48K	24K or 48K	32K	32K	32K
Cycle time, microseconds	0.750	0.750	0.560	0.560	0.560
Access time, microseconds	0.300	0.300	0.300	0.300	0.300
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Opt.; 310K bytes	Opt.; 310K bytes	Opt.; 2M bytes	Opt.; 2M bytes	Opt.; 2M bytes
Cartridge disk drive	Std.; 340M bytes	Std.; 640M bytes	No	Std.; 120M bytes	Std.; 120M bytes
Pack disk drive	Opt.; 1200M bytes	Opt.; 1200M bytes	No	Opt.; 365M bytes	Opt.; 365M bytes
Fixed-head disk/drum	Opt.; 2.15M bytes	Opt.; 2.15M bytes	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Optional	Optional	Optional
10-key numeric keyboard	No	No	No	No	No
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 300 cps	Opt.; 300 cps	Opt.; 500 cps	Opt.; 500 cps	Opt.; 500 cps
Paper tape punch	Opt.; 75 cps	Opt.; 75 cps	Opt.; 75 cps	Opt.; 75 cps	Opt.; 75 cps
Punched card reader	Std.; 600 cpm	Std.; 1000 cpm	Opt.; 600 cpm	Opt.; 600 cpm	Opt.; 600 cpm
Punched card punch	No	No	No	No	No
Punched card reader/punch	Opt.; 500/100 cpm	Opt.; 500/100 cpm	No	No	No
Serial printer	Opt.; 30 cps	Opt.; 30 cps	Opt.; 10-120 cps	Opt.; 10-120 cps	Opt.; 10-120 cps
Line printer	Std.; 600 lpm	Std.; 900 lpm	Opt.; 200-1250 lpm	Optional	Std.; 200 lpm
Reel-to-reel tape drive	Std.; 36K cps	Std.; 36K cps	Opt.; 72 KBS	—	Std.; 36 KBS
Cassette tape drive	Opt.; 30 cps	Opt.; 30 cps	No	No	No
Cartridge tape drive	No	No	Std.; 960 cps	Std.; 960 cps	Std.; 960 cps
Magnetic ledger card device	No	No	No	No	No
CRT	Std.; 24 x 80 char.	Std.; 24 x 80 char.	Std.; 24 x 80 char.	Std.; 24 x 80 char.	Std.; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	128	128	16—see comments	16—see comments	16—see comments
Synchronous	Opt.; to 9.6K bps	Opt.; to 9.6K bps	No	Opt.; 9600 bps	Opt.; 9600 bps
Asynchronous	Opt.; to 19.2K bps	Opt.; to 19.2K bps	No	Opt.; 1800 bps	Opt.; 1800 bps
Protocols supported	IBM 2780, HASP, CDC UT200, Univac 1004	IBM 2780, HASP, CDC UT200, Univac 1004	IBM 2780	IBM 2780, bisync	IBM 2780, bisync
SOFTWARE SUPPORT					
COBOL	Yes	Yes	No	No	No
RPG	Yes	Yes	No	No	No
FORTRAN	Yes	Yes	Yes	Yes	Yes
BASIC	Yes	Yes	Yes	Yes	Yes
Assembler	Yes	Yes	Yes	Yes	Yes
Other programming languages	SNOBOL, FORGO	SNOBOL, FORGO	ALGOL	ALGOL	ALGOL
Multiprogramming	Yes; 256 partitions	Yes; 256 partitions	Yes	Yes	Yes
Language implemented in firmware	No	No	No	No	No
Operating system implemented in firmware	No	No	Partially	Partially	Partially
General accounting packages	No	No	No	No	No
Industry application areas	Multi-use and time-sharing	Multi-use and time-sharing	Manufacturing	Manufacturing	Manufacturing
Data base management system	Yes	Yes	No	Yes	Yes
File access methods supported	Sequential, random, index sequential	Sequential, random, index sequential	Sequential, random	Sequential, random	Sequential, random
Software separately priced	No (see comments)	No (see comments)	Yes—see comments	Yes—see comments	Yes—see comments
Technical help separately priced	No	No	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$225,000	$290,000	$21,000	$31,500	$61,700
Monthly rental of basic system, $	3rd-party lease	3rd-party lease	See comments	See comments	See comments
Date of first U.S. delivery	1975	1975	May 1977	December 1976	December 1976
Number installed in U.S. to date	NA	NA	NA	NA	NA
COMMENTS	Total DBMS and query language priced separately; RJE host and re-mote; one 300 MB and one 40 MB disk drives are standard	Total DBMS and query language priced separately; RJE host and re-mote; two 300 MB and one 40 MB disk drives are standard	HP recommends a maximum of four active terminals; operating system is included in package price; third-party lease only	HP recommends a maximum of four active terminals; operating system is included in package price; third-party lease only	HP recommends a maximum of four active terminals; operating system is included in package price; third-party lease only

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Hewlett-Packard General Sys. Div. 3000 Series I	Hewlett-Packard General Sys. Div. 3000/II Model 6	Hewlett-Packard General Sys. Div. 3000/II Model 8	Hewlett-Packard Calculator Products Division 9830A	Hewlett-Packard Calculator Products Division 9830B
DATA FORMATS					
Word length, bits	16	16	16	8-bit byte	8-bit byte
Decimal digits per word	2	2	2	1 per byte	1 per byte
Bytes (characters) per word	2	2	2	1 per byte	1 per byte
Operand length, words	1, 2, 4	1, 2, 4	1, 2, 4	—	—
Instruction length, words	½, 1	½, 1	½, 1	2 bytes	2 bytes
CPU					
Model	HP 3000	HP 3000	HP 3000	HP 9830A	HP 9830B
Add time, microseconds	1.225	1.050	1.050	1000 (approx.)	1000 (approx.)
No. of programmable registers	16	20	20	See comments	See comments
No. of I/O ports on basic system and maximum	5; 15	10	23	5; 13	5; 13
INTERNAL STORAGE					
Type	Core	MOS	MOS	MOS	MOS
Capacity of basic system, bytes	128K	128K	320K	3520	15,808
Maximum capacity, bytes	128K	256K	512K	15,808	30,144
Increment size, bytes	—	64K	64K	4, 8K	14,336
Cycle time, microseconds	1.00	0.70	0.70	13	13
Access time, microseconds	0.50	0.35	0.35	—	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	No	No	No
Cartridge disk drive	No	No	No	Opt.; 4.8M bytes	Opt.; 4.8M bytes
Pack disk drive	Std.; 50-350M bytes	Std.; 50-400M bytes	Std.; 50-400M bytes	No	No
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	Standard	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 500 cps	Opt.; 500 cps	Opt.; 500 cps	Opt.; 20 cps	Opt.; 20 cps
Paper tape punch	Opt.; 75 cps	Opt.; 75 cps	Opt.; 75 cps	No	No
Punched card reader	Opt.; 600 cpm	Opt.; 600 cpm	Opt.; 600 cpm	Opt.; 300 cpm	Opt.; 300 cpm
Punched card punch	No	No	No	No	No
Punched card reader/punch	Opt.; 75/45 cpm	Opt.; 200/75 cpm	Opt.; 200/75 cpm	No	No
Serial printer	Opt.; 30-120 cps	Opt.; 30-120 cps	Opt.; 30-120 cps	No	No
Line printer	Opt.; 200-1250 lpm	Opt; 200-1250 lpm	Opt.; 200-1250 lpm	Std., 250, 300 lpm	Opt.; 250, 300 lpm
Reel-to-reel tape drive	Std.; 72 KBS	Std.; 72 KBS	Std.; 72 KBS	No	No
Cassette tape drive	Opt.; 240 cps	No	No	Std.; 375 bps	Std.; 375 bps
Cartridge tape drive	No	Opt.; 240 cps	Opt.; 240 cps	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Opt.; 24 x 80 char.	Opt.; 24 x 80 char.	Opt.; 24 x 80 char.	Opt.; 24 x 80 char.	Opt.; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	16	31	63	1	1
Synchronous	Opt., to 4800 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Asynchronous	Opt.; to 2400 bps	Opt.; to 2400 bps	Opt.; to 2400 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Protocols supported	IBM 2780/3780	IBM 2780/3780	IBM 2780/3780	None	None
SOFTWARE SUPPORT					
COBOL	Yes	Yes	Yes	No	No
RPG	Yes	Yes	Yes	No	No
FORTRAN	Yes	Yes	Yes	No	No
BASIC	Yes	Yes	Yes	Yes	Yes
Assembler	SPL	SPL	SPL	No	No
Other programming languages	None	APL	APL	None	None
Multiprogramming	Yes	Yes	Yes	No	No
Language implemented in firmware	Partially	Partially	Partially	Fully	Fully
Operating system implemented in firmware	Partially	Partially	Partially	Fully	Fully
General accounting packages	No	No	No	Yes	Yes
Industry application areas	Manufacturing education	Manufacturing, education	Manufacturing, education	Real estate, medical, engineering	Real estate, medical, engineering
Data base management system	Yes	Yes	Yes	No	No
File access methods supported	Direct, sequential, keyed sequential	Direct, sequential, keyed seq., chained	Direct, sequential, keyed seq., chained	None	None
Software separately priced	Yes	Yes	Yes	Yes	Yes
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$75,000	$110,000	$140,000	$4,900	$8,350
Monthly rental of basic system, $	$1,566	$2,297 (5-yr. lease)	$2,923 (5-yr. lease)	NA	NA
Date of first U.S. delivery	April 1977	March 1977	March 1977	November 1972	May 1976
Number installed in U.S. to date	850 (3000 Series)	850 (3000 Series)	850 (3000 Series)	NA	NA
COMMENTS		3000 Series II is upgrade from previous 3000CX Series	3000 Series II is upgrade from previous 3000CX Series	Software assigns portions of read/write memory to serve as registers	Software assigns portions of read/write memory to serve as registers

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Hewlett-Packard Calculator Products Division 9896A	Honeywell Series 60 Model 6/06	Honeywell Series 60 Model 6/34	Honeywell Series 60 Model 6/36	Honeywell Series 60 Model 6/43
DATA FORMATS					
Word length, bits	16	16	16	16	16
Decimal digits per word	4	2	2	2	2
Bytes (characters) per word	2	2	2	2	2
Operand length, words	—	bit, ½, 1, 2	bit, ½, 1, 2	bit ½, 1, 2	bit, ½, 1, 2
Instruction length, words	1	1	1, 2, 3	1, 2, 3	1, 2, 3
CPU					
Model	HP 9831A	Honeywell CPS 92XX	Honeywell CPS 945X	Honeywell CPS 946X	Honeywell CPS 955X
Add time, microseconds	470 (12 digits)	2	1.9	1.9	—
No. of programmable registers	No	7	18	18	24 + 3 (SIP)
No. of I/O ports on basic system and maximum	3; 12	64	8 maximum	160 maximum	160 maximum
INTERNAL STORAGE					
Type	MOS	NMOS, core	NMOS, core	NMOS, core	NMOS, core
Capacity of basic system, bytes	7,162	8K	8K	8K	8K
Maximum capacity, bytes	31,738	128K	64K	128K	1024K
Increment size, bytes	7,162	8K, 16K	8K, 16K, 32K	8K, 16K	8K, 16K
Cycle time, microseconds	1.83	0.65/0.55, 1.2	0.65/0.55, 1.2	0.65/0.55, 1.2	0.65/0.55, 1.2
Access time, microseconds	—	0.44/0.29, 0.4	0.44/0.29, 0.4	0.44/0.29, 0.4	0.44/0.29, 0.4
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Std.; 2M bytes	No	Opt.; 1024K bytes	Opt.; 1024K bytes	Opt.; 1024K bytes
Cartridge disk drive	Std.; 250K bytes	Opt.; 40M bytes	Opt.; 40M bytes	Opt.; 40M bytes	Opt.; 40M bytes
Pack disk drive	No	Opt.; 60M bytes	No	No	No
Fixed-head disk/drum	No	Opt.; 1024K bytes	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Optional	Optional	Optional	Optional
10-key numeric keyboard	Standard	Optional	Optional	Optional	Optional
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 20 cps	Opt.; 300 cps	No	No	No
Paper tape punch	No	Opt.; 110 cps	No	No	No
Punched card reader	Opt.; 300 cpm	Opt.; 300-1000 cpm	Opt.; 300, 500 cpm	Opt.; 300, 500 cpm	Opt.; 300, 500 cpm
Punched card punch	No	Opt.; 100-400 cpm	No	No	No
Punched card reader/punch	No	Opt.; 400/100 cpm	No	No	No
Serial printer	Std.; 30 cps	Opt.; 165 cps	Opt.; 165 cps	Opt.; 165 cps	Opt.; 165 cps
Line printer	Opt.; 250, 300 lpm	Opt.; 240-1100 cpm	Opt.; 240-600 lpm	Opt.; 240-600 lpm	Opt.; 240-600 lpm
Reel-to-reel tape drive	No	Opt.; 20 KBS	Opt.; 25-60 KBS	Opt.; 25-60 KBS	Opt.; 25-60 KBS
Cassette tape drive	No	Opt.; 700 cps	Opt.; 700 cps	Opt.; 700 cps	Opt.; 700 cps
Cartridge tape drive	Opt.; 2750 cps	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Opt.; 24 x 80 char.	Opt.; 12 x 80, 24 x 80 char.	Opt.; 12 x 80, 24 x 80 char.	Opt.; 12 x 80, 24 x 80 char.	Opt.; 12 x 80, 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	None	128	8/controller	8/controller	8/controller
Synchronous	No	Opt.; to 100K bps	Opt.; to 72K bps	Opt.; to 72K bps	Opt.; to 72K bps
Asynchronous	No	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Protocols supported	None	None	Bisync/2780	Bisync/2780	Bisync/2780
SOFTWARE SUPPORT					
COBOL	No	No	Yes	Yes	Yes
RPG	No	No	Yes	Yes	Yes
FORTRAN	No	Yes	Yes	Yes	Yes
BASIC	Yes	Yes	Yes	Yes	Yes
Assembler	No	Macro assembler	Yes	Yes	Yes
Other programming languages	None	None	Macro preprocessor	Macro preprocessor	Macro preprocessor
Multiprogramming	No	Yes	Yes	Yes	Yes
Language implemented in firmware	Fully	No	No	No	No
Operating system implemented in firmware	Fully	No	No	No	No
General accounting packages	Yes	Yes	No	No	No
Industry application areas	Manufacturing, distribution	Hospital, manuf., inventory, education	Office automation	Office automation	Office automation
Data base management system	No	No	No	No	No
File access methods supported	Direct	Random, sequential, index seq.	Random, sequential, fixed random	Random, sequential, fixed random	Random, seq., index seq., fixed random
Software separately priced	Yes	Yes	Yes	Yes	Yes
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$18,700	$5,500 (proc.)	$4,500 (proc.)	$3,700 (proc.)	$6,350 (proc.)
Monthly rental of basic system, $	$500	—	$211 (3-yr. lease)	$161 (3-yr. lease)	$295 (3-yr. lease)
Date of first U.S. delivery	March 1977	January 1976	January 1976	January 1976	1977
Number installed in U.S. to date	—	NA	NA	NA	NA
COMMENTS		Microprogrammed to emulate the Honeywell 716 CPU	Processor includes basic control panel and 4-slot chassis	Processor includes basic control panel and 5-slot chassis	Processor includes basic control panel and 5-slot chassis

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Honeywell Series 60 Level 62	IBM System/3	IBM System/32	IBM System/34	IBM 1130
DATA FORMATS					
Word length, bits	8-bit byte	8-bit byte	8-bit byte	8-bit byte	16
Decimal digits per word	2 per byte	1 per byte	1 per byte	1 per byte	2
Bytes (characters) per word	1 per byte	1 per byte	1 per byte	1 per byte	2
Operand length, words	2 bytes	1-16 digits	1-16 digits	1-16 digits	1, 2
Instruction length, words	2-8 bytes	4-6 bytes	3-6 bytes	4, 5, 6 bytes	1, 2
CPU					
Model	Honeywell 62	IBM System/3	IBM System/32	IBM System/34	IBM 1130
Add time, microseconds	—	24 (5 digits)	150 (5 digits)	68.5 (5 digits)	4.9; 8.0
No. of programmable registers	29	—	4	NA	3
No. of I/O ports on basic system and maximum	6 std.; 3 opt.	—	—	—	—
INTERNAL STORAGE					
Type	MOS	Core, MOS	MOS	MOS	Core
Capacity of basic system, bytes	48K	8K	16K	32K	8K
Maximum capacity, bytes	224K	256K	32K	65K	64K
Increment size, bytes	16K	4, 8, 16, 32K	8K	16K	8K
Cycle time, microseconds	1.0	1.52	0.60	0.60	2.2; 3.6
Access time, microseconds	—	—	0.25	—	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Opt.; 512K bytes	Opt.; via 3741	Std.; 303K bytes	Std.; 303K bytes	No
Cartridge disk drive	Opt.; 46.4M bytes	Opt.; 9.8M bytes	See comments	See comments	Std.; 5.12M bytes
Pack disk drive	Opt.; 480M bytes	Opt.; 506M bytes	No	No	Opt.; 5.12M bytes
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Optional	Standard	Optional	Standard
10-key numeric keyboard	Standard	Optional	Standard	Optional	No
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	No	No	No	Opt.; 60 cps
Paper tape punch	No	No	No	No	Opt.; 14.8 cps
Punched card reader	Opt.; 300-1050 cpm	Opt.; 600, 1000 cpm	No	No	Opt.; 100, 600 cpm
Punched card punch	Opt.; 100-400 cpm	No	No	No	Opt.; 120 cpm
Punched card reader/punch	Opt.; 500, 1000 cpm	Opt.; 250/60 cpm	Opt.; 50/12-50 cpm	No	Opt.; 300/60 cpm
Serial printer	Std.; 30 cps console	Opt.; 85 cps	Std.; 40, 80 cps	Opt.; 40, 80, 120 cps	Std.; 15 cps
Line printer	Opt.; 100-1600 lpm	Opt.; 100-1100 lpm	Std.; 50-155 lpm	Opt.; 160, 300 lpm	Opt.; 40-1100 lpm
Reel-to-reel tape drive	Opt.; 10.4-60 KBS	Opt.; 20-80 KBS	No	No	Opt.; 15 KBS
Cassette tape drive	Opt.; 700 cps	No	No	No	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Opt.; 12 x 80 char.	Opt.; 12 x 40, 12 x 80, 24 x 80 char.	Standard; 6 x 40 char.	Optional; 24 x 80 char.	Optional; 52 x 74 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	9	8	1	8	16
Synchronous	Opt.; 9600 bps	Opt.; to 50K bps	Opt.; to 7200 bps	Opt.; to 9600 bps	Opt.; to 4800 bps
Asynchronous	Opt.; to 2400 bps	No	No	No	No
Protocols supported	None	SDLC	SDLC, Bisync	SDLC, Bisync	Bisync
SOFTWARE SUPPORT					
COBOL	Yes	Yes	No	No	No
RPG	Yes	RPG II	RPG II	RPG II	Yes
FORTRAN	Yes	Yes	No	No	Yes
BASIC	No	Yes	No	No	No
Assembler	No	No	Macro assembler	Yes	Yes, and macro
Other programming languages	None	None	None	No	None
Multiprogramming	Yes	Yes; 3 partitions	No	Yes; 8 partitions	No
Language implemented in firmware	No	No	No	Partially	No
Operating system implemented in firmware	No	No	Partially	Partially	No
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Distribution, manufacturing	Dist., medical, manuf., educ.	Dist., medical, manuf., word proc.	Distribution, medical, manufacturing	Engin., manuf., dist., medical
Data base management system	Yes	No	No	No	No
File access methods supported	Sequential, indexed, relative	Random, sequential, index sequential	Random, sequential, index sequential	Random, sequential, index sequential	Random, sequential, index sequential
Software separately priced	Yes	Yes	Yes	Yes	Yes
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$36,879 (proc.)	$22,430	$33,560	$34,700	$19,840
Monthly rental of basic system, $	$885 (1-yr. lease)	$674	$748	$1,062	$136
Date of first U.S. delivery	August 1974	December 1970	February 1975	January 1978	1965
Number installed in U.S. to date	NA	Over 30,000	Over 10,000	0	4,000 (approx.)
COMMENTS	Performance increase packages of 25, 67, or 117 percent opt.; see Report 70C-480-12 for more details	Six different models currently in line; see Report 70C-491-21 for more details	System also includes 3.2M-13.75M bytes of nonremovable disk storage; see Report 70C-491-25	Multi-user system; serves up to 8 independently functioning users; system includes 8.6M to 27.1M bytes of nonremovable disk storage; see Report 70C-491-27	Also available without std. disk for as little as $14,150; cycle times vary with processor model

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	IBM System/360 Model 20	IBM 5100	International Computers Ltd. 2903	International Computers Ltd. 2904	Jacquard Systems J100 Videocomputer
DATA FORMATS					
Word length, bits	8-bit byte	8-bit byte	24	24	16
Decimal digits per word	2 per byte	1 per byte	7	7	4
Bytes (characters) per word	1 per byte	1 per byte	4	4	2
Operand length, words	1-16 digits	—	12 bits	12 bits	1
Instruction length, words	2, 4, 6 bytes	2 bytes	1	1	1
CPU					
Model	IBM 360/20	IBM 5100	ICL 2903	ICL 2904	Jacquard J100
Add time, microseconds	209 (5 digits)	1000 (approx.)	17.7 (12 bits)	11.8 (12 bits)	7
No. of programmable registers	8	Software-assigned	8	8	4
No. of I/O ports on basic system and maximum	—	2; variable	6	8	1; 63
INTERNAL STORAGE					
Type	Core	MOS	MOS	MOS	MOS, core
Capacity of basic system, bytes	4K	16K	64K (6-bit)	128K (6-bit)	32K
Maximum capacity, bytes	32K	64K	256K (6-bit)	384K (6-bit)	256K
Increment size, bytes	4K	16K	32K (6-bit)	32K (6-bit)	32K
Cycle time, microseconds	See comments	0.53 (2 bytes)	1.14	1.14	1.5
Access time, microseconds	—	0.33	0.57	0.57	3.0
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	No	No	Std.; 2; 250K bytes
Cartridge disk drive	No	No	Opt.; 30M bytes	Opt.; 30M bytes	Opt.; 4; 12M bytes
Pack disk drive	Opt.; 21.6M bytes	No	Opt.; 240M bytes	Opt.; 240M bytes	Opt.; 4; 80M bytes
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Optional	Standard	Standard	Standard	Standard
10-key numeric keyboard	No	Standard	Standard	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	No	Opt.; 1000 cps	Opt.; 1000 cps	No
Paper tape punch	No	No	Opt.; 110 cps	Opt.; 110 cps	No
Punched card reader	Opt.; 600, 1000 cpm	No	Std.; 300 cpm	Std.; 300 cpm	Opt.; 300/60 cpm
Punched card punch	Opt.; 300, 500 cpm	No	Opt.; 100 cpm	Opt.; 100 cpm	No
Punched card reader/punch	Opt.; 310/90 cpm	No	No	No	No
Serial printer	Opt.; 15.5 cps	Opt.; 80 cps	No	No	Opt.; to 166 cps
Line printer	Opt.; 260-1100 lpm	No	Std.; 300-1200 lpm	Std.; 300-1500 lpm	Opt.; to 900 lpm
Reel-to-reel tape drive	Opt.; 150-60 KBS	No	Opt.; 80 KBS	Opt.; 80 KBS	Opt.; 72K cps
Cassette tape drive	No	No	No	No	No
Cartridge tape drive	No	Std.; 2850 cps	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	No	Standard; 16 x 64 char.	Standard; 8 x 32, 20 x 50 char.	Standard; 8 x 32, 20 x 50 char.	Opt.; 1920 char.; up to 30 units
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	1	1	4	6	10
Synchronous	Opt.; to 50K bps	No	Std.; to 4800 bps	Std.; to 4800 bps	Opt.; to 9600 bps
Asynchronous	No	Opt.; to 300 bps	Opt.; 600 bps	Opt.; 600-1200 bps	Opt.; to 9600 bps
Protocols supported	Bisync	IBM 2741	ICL 7181, IBM 2780	ICL 7181, IBM 2780	IBM 2780/3780; SILA II
SOFTWARE SUPPORT					
COBOL	No	No	Yes	Yes	No
RPG	Yes	No	Yes	Yes	No
FORTRAN	No	No	Yes	Yes	No
BASIC	No	Yes	Yes	No	Yes
Assembler	Yes and macro	No	No	Yes	Yes
Other programming languages	PL/1	APL	None	None	None
Multiprogramming	No	No	Yes; 4 partitions	Yes; 4 partitions	Yes; 256 partitions
Language implemented in firmware	No	Fully	No	No	No
Operating system implemented in firmware	No	Fully	Partially	Partially	No
General accounting packages	Yes	No	Yes	Yes	Yes
Industry application areas	Manuf., dist., educ., gov't.	Financial analysis, statistics	Mfg., retail, distribution	Mfg., retail, distribution	Distrib. processing, bus.,med.,word proc.
Data base management system	No	No	Yes	Yes	No
File access methods supported	Random, sequential, index seq.	Sequential	Random, sequential, index seq.	Random, sequential, index seq.	Sequential, random, index sequential
Software separately priced	Yes	Some	Yes	Yes	Yes (app. packages)
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$13,470	$8,975	$85,000	$135,000	$21,060
Monthly rental of basic system, $	$638	$450 (3-mo. lease)	$2,200	$3,500	$725
Date of first U.S. delivery	November 1964	September 1975	July 1974	NA	August 1975
Number installed in U.S. to date	10,000 (approx.)	NA	16	NA	500
COMMENTS	Low end of IBM's 360 Series; cycle times vary with processor model; see Report 70C-491-02 for more details	Portable computer weighing 50 lbs.; RS-232C interface available for non-IBM peripherals;	Multijobbing capability with full simultaneity; direct data entry through CRT displays (8 max.); jobs include RJE, batch, spooling	Firmware-enhanced version of 2903	Includes CPU with 64K bytes of memory, 45-cps printer, & multi-tasking system that permits simultaneous execution of word processing and data processing tasks

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Jacquard Systems J50 Videocomputer	Litton/Sweda International Litton 1600 Series	Logical Machine Corp. ADAM	Medical Computer System 2000	Microdata Reality
DATA FORMATS					
Word length, bits	16	16	16	16	16
Decimal digits per word	4	4	—	4	2
Bytes (characters) per word	2	2	2	2	2
Operand length, words	1	½, 1	1	1-3	½, 1, 2, 3
Instruction length, words	1	1	1, 2	1-3	½, 1, 2, 3
CPU					
Model	Jacquard J50	DG Nova 1220	LOMAC ALP	HP 2108	Microdata 1600
Add time, microseconds	7	0.95	—	1.94 (5 digits)	5
No. of programmable registers	4	4	64	5	34
No. of I/O ports on basic system and maximum	1; 63	1	7; 7	9; 41	—
INTERNAL STORAGE					
Type	MOS, core	Core	MOS	MOS	Core
Capacity of basic system, bytes	32K	64K	32K	4K	16K
Maximum capacity, bytes	256K	64K	64K	384K	128K
Increment size, bytes	32K	—	32K	8, 16, 32K	8, 16K
Cycle time, microseconds	1.5	1.2	0.8	0.65	1
Access time, microseconds	3.0	0.5	0.5	0.40	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Std.; 2; 250K bytes	No	Opt.; 280K bytes	Std.; 300K bytes	No
Cartridge disk drive	No	Std.; 40M bytes	Std.; 10.6M bytes	Optional	Std.; 40M bytes
Pack disk drive	No	No	No	Opt.; 160M bytes	Opt.; 900M bytes
Fixed-head disk/drum	No	No	No	No	Opt.; 2M bytes
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Optional
10-key numeric keyboard	Standard	Standard	Standard	Standard	Optional
Full accounting keyboard	No	No	Standard	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	No	No	No	No
Paper tape punch	No	No	No	No	No
Punched card reader	No	No	No	No	Opt.; 150-600 cpm
Punched card punch	No	No.	No	No	No
Punched card reader/punch	No	No	No	No	Opt.; 200/75 cpm
Serial printer	Opt.; to 166 cps	Std.; 165 cps	Std.; 100-300 cps	No	Opt.; 165 cps
Line printer	Opt.; to 900 lpm	No	No	Std.; to 1200 lpm	Opt.; 300-600 lpm
Reel-to-reel tape drive	No	No	No	Std.; 72 KBS	Std.; 20, 40 KBS
Cassette tape drive	No	No	No	Standard	No
Cartridge tape drive	No	No	No	Standard	Opt.; 12.8 KBS
Magnetic ledger card device	No	No	No	No	No
CRT	No	Opt.; 24 x 80 char.	Std.; 1920 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	10	8	No	64	32
Synchronous	Std.; to 9600 bps	—	No	Opt.; to 9600 bps	Opt.; to 9600 bps
Asynchronous	Std.; to 9600 bps	—	No	Std.; to 9600 bps	Opt.; to 9600 bps
Protocols supported	IBM 2780/3780; SILA II	—	No	None	IBM 2780
SOFTWARE SUPPORT					
COBOL	No	No	No	No	No
RPG	No	No	No	No	Yes
FORTRAN	No	No	No	Yes	No
BASIC	Yes	Yes	No	Yes	Yes
Assembler	Yes	No	No	Yes	Yes
Other programming languages	None	None	ADAM	ALGOL	English
Multiprogramming	Yes; 256 partitions	Yes	No	No	Yes
Language implemented in firmware	No	No	Partial	Partially	Partially
Operating system implemented in firmware	No	No	Partial	No	Partially
General accounting packages	Yes	Yes	No	Yes	Yes
Industry application areas	Distrib. processing, bus.,med.,word proc.	Wholesale distribution, client acctg.	All	Hospital	Engin., educ. time-share, acctg.
Data base management system	No	No	No	Yes	Yes
File access methods supported	Sequential, random, index sequential	Sequential, index sequential	Index sequential	Sequential, index sequential	Random, sequential
Software separately priced	Yes (app. packages)	Yes	No	Yes	No
Technical help separately priced	Yes	Yes	No	No	No
PRICING & AVAILABILITY					
Purchase price of basic system, $	$17,960	$40,140	$34,995	$150,000-$550,000	$33,950
Monthly rental of basic system, $	$550	—	$720 (5-yr. lease)	$2,500-$7,500	Purchase only
Date of first U.S. delivery	August 1975	—	April 1975	October 1973	November 1973
Number installed in U.S. to date	150	NA	250-300	15	Over 500
COMMENTS	Includes CPU with 64K bytes of memory, 45-cps printer; stand-alone word or data processing system with sophisticated communications capability		ADAM is designed for use by non-data processing professionals	Separate systems for on-line admission and charge collection also available	Multi-user, interactive system; marketed through a nationwide dealer network

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Mini-Computer Systems MICOS System 1003	Mini-Computer Systems MICOS System 2003	Mini-Computer Systems MICOS System 3003	Mini-Computer Systems MICOS System 4006	Minuteman Computer Corp. 1774
DATA FORMATS					
Word length, bits	16	16	16	16	16
Decimal digits per word	4	4	4	4	2
Bytes (characters) per word	2	2	2	2	2
Operand length, words	Variable	Variable	Variable	Variable	1
Instruction length, words	1, 2, 3	1, 2, 3	1, 2, 3	1, 2, 3	1, 2
CPU					
Model	DG Nova 3/12	DG Nova 3/12	DG Nova 3/12	DG Nova 3/12	DG Nova 3/4
Add time, microseconds	0.8	0.8	0.8	0.8	2.7
No. of programmable registers	4	4	4	4	5
No. of I/O ports on basic system and maximum	62 maximum	62 maximum	62 maximum	62 maximum	2
INTERNAL STORAGE					
Type	Core	Core	Core	Core	Core
Capacity of basic system, bytes	65K	65K	65K	128K	16K
Maximum capacity, bytes	256K	256K	256K	256K	32K
Increment size, bytes	32K	32K	32K	32K	8, 16K
Cycle time, microseconds	0.8	0.8	0.8	0.8	0.8; 1.0
Access time, microseconds	0.4	0.4	0.4	0.4	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	No	No	No
Cartridge disk drive	Std.; 9.8M bytes	Opt.; 9.8M bytes	Opt.; 9.8M bytes	Opt.; 9.8M bytes	Std.; 40M bytes
Pack disk drive	Opt.; 40-160M bytes	Std.; 80M bytes	Std.; 160M bytes	Std.; 160M bytes	Optional
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	Standard	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Optional	Optional	Optional	Optional	Optional
Paper tape punch	Optional	Optional	Optional	Optional	Optional
Punched card reader	Opt.; 300-1000 cpm	Opt.; 300-1000 cpm	Opt.; 300-1000 cpm	Opt.; 300-1000 cpm	Optional
Punched card punch	No	No	No	No	Optional
Punched card reader/punch	No	No	No	No	Optional
Serial printer	Std.; 165 cps	Opt.; 165, 330 cps	Opt.; 165, 330 cps	Opt.; 165, 330 cps	Std.; 165 cps
Line printer	Opt.; 300, 600 lpm	Std.; 300 lpm	Std.; 600 lpm	Std.; 600 lpm	Opt.; 300-900 lpm
Reel-to-reel tape drive	Opt.; 30-72 KBS	Opt.; 30-72 KBS	Opt.; 30-72 KBS	Opt.; 30-72 KBS	Optional
Cassette tape drive	No	No	No	No	Optional
Cartridge tape drive	No	No	No	No	Optional
Magnetic ledger card device	No	No	No	No	No
CRT	Std.; 24 x 80 char.	Std.; 24 x 80 char.	Std.; 24 x 80 char.	Std.; 24 x 80 char.	Standard; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	1	1	1	1	1
Synchronous	Opt.; 50,000 bps	Opt.; 50,000 bps	Opt.; 50,000 bps	Opt.; 50,000 bps	Optional
Asynchronous	No	No	No	No	Optional
Protocols supported	IBM 2780, HASP, CDC 200 UT	IBM 2780, HASP, CDC 200 UT	IBM 2780, HASP, CDC 200 UT	IBM 2780, HASP, CDC 200 UT	None
SOFTWARE SUPPORT					
COBOL	No	No	No	No	Yes
RPG	No	No	No	No	No
FORTRAN	No	No	No	No	Yes
BASIC	Yes (Extensive)	Yes (Extensive)	Yes (Extensive)	Yes (Extensive)	Yes
Assembler	No	No	No	No	Yes
Other programming languages	None	None	None	None	None
Multiprogramming	Yes	Yes	Yes	Yes	No
Language implemented in firmware	No	No	No	No	No
Operating system implemented in firmware	No	No	No	No	No
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Munic. govt., educ., fuel, apparel, etc.	Munic. govt., educ., fuel, apparel, etc.	Munic. govt., educ., fuel, apparel, etc.	Munic. govt., educ., fuel, apparel, etc.	Dist., mfg., liquor wholesalers
Data base management system	No	No	No	No	Yes
File access methods supported	Sequential, random, index sequential	Sequential, random, index sequential	Sequential, random, index sequential	Sequential, random, index sequential	Random, sequential, index seq.
Software separately priced	Yes (applications)	Yes (applications)	Yes (applications)	Yes (applications)	Yes
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$49,900	$74,600	$84,450	$104,950	$34,995
Monthly rental of basic system, $	NA	NA	NA	No	Purchase only
Date of first U.S. delivery	March 1973	—	—	—	1973
Number installed in U.S. to date	Over 600 all mdls.	Over 600 all mdls.	Over 600 all mdls.	Over 600 all mdls.	10
COMMENTS	3 CRT's std.; 330-cps printer opt	3 CRT's std.; 600-lpm printer opt	3 CRT's std.; 300-lpm printer opt	3 CRT's std.; 300-lpm printer opt	Turnkey system

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Minuteman Computer Corp. 1775	Minuteman Computer Corp. 1776	Modular Computer Systems Modcomp II	Modular Computer Systems Modcomp IV	Mylee Digital Sciences 3056
DATA FORMATS					
Word length, bits	16	16	16 words	16 words	16
Decimal digits per word	2	2	4	4	2
Bytes (characters) per word	2	2	2	2	2
Operand length, words	1	1	1	1 or 2	½-8
Instruction length, words	1, 2	1, 2	1 or 2	1, 2, 3, or 4	1-3
CPU					
Model	DG Nova 3/12	DG Nova 3/12	Modcomp II/26	Modcomp IV/35	Mylee System 3000
Add time, microseconds	2.7	2.7	2.4	1.6	125 (5 digits)
No. of programmable registers	5	5	15	15	4
No. of I/O ports on basic system and maximum	14	14	8; 16	16; 32	11; 19
INTERNAL STORAGE					
Type	Core	Core	Core	Core	MOS
Capacity of basic system, bytes	16K	32K	64K	128K	56K
Maximum capacity, bytes	64K	64K	128K	1M	152K
Increment size, bytes	8, 16, 32K	8, 16, 32K	32, 64	128	32K
Cycle time, microseconds	0.8; 1.0	0.8; 1.0	0.8; 1.1	0.5	0.8
Access time, microseconds	—	—	NA	NA	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	Opt.; 315K bytes	Opt.; 315K bytes	No
Cartridge disk drive	Std., 40M bytes	Std.; 40M bytes	Opt.; 40M bytes	Opt.; 40M bytes	Std.; 12.5M bytes
Pack disk drive	Optional	Optional	Opt.; 168M bytes	Opt.; 168M bytes	No
Fixed-head disk/drum	No	No	Opt.; 2M bytes	Opt.; 2M bytes	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Optional	Optional	Standard
10-key numeric keyboard	Standard	Standard	Optional	Optional	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Optional	Optional	Opt.; 625 cps	Opt.; 625 cps	No
Paper tape punch	Optional	Optional	Opt.; 110 cps	Opt.; 110 cps	No
Punched card reader	Optional	Optional	Opt.; 300-1000 cpm	Opt.; 300-1000 cpm	Opt.; 300 cpm
Punched card punch	Optional	Optional	Opt.; 100 cpm	Opt.; 100 cpm	No
Punched card reader/punch	Optional	Optional	No	No	No
Serial printer	Std.; 165 cps	Std.; 165 cps	Opt.; 165 cps	Opt.; 165 cps	Std.; 165 cpm
Line printer	Std.; 300-900 lpm	Std.; 300-900 lpm	Opt.; 300-1000 lpm	Opt.; 300-1000 lpm	Opt.; 300 lpm
Reel-to-reel tape drive	Optional	Optional	Opt.; 45-75 ips	Opt.; 45-75 ips	No
Cassette tape drive	Optional	Optional	No	No	No
Cartridge tape drive	Optional	Optional	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Opt.; 1920 char.	Opt.; 1920 char.	Standard (2); 11 x 32 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	1	1	32	128	16
Synchronous	Optional	Optional	Opt.; 250-2400 bps	Optional	No
Asynchronous	Optional	Optional	Opt.; 10-960 bps	Optional	Opt.; to 1200 bps
Protocols supported	None	None	IBM 2780/3780, 3270, SDLC	IBM 2780/3780, 3270, SDLC	None
SOFTWARE SUPPORT					
COBOL	Yes	Yes	October 1977	October 1977	No
RPG	No	No	Yes	Yes	No
FORTRAN	Yes	Yes	Yes	Yes	No
BASIC	Yes	Yes	No	No	No
Assembler	Yes	Yes	Yes	Yes	No
Other programming languages	None	None	None	None	ACE
Multiprogramming	No	No	Yes; 256 tasks	Yes; 256 tasks	Yes; 12 partitions
Language implemented in firmware	No	No	No	No	Partially
Operating system implemented in firmware	No	No	No	No	Partially
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Dist., mfg., liquor wholesalers	Dist., mfg., liquor wholesalers	Distribution, manufacturing	Distribution, manufacturing	Dist., inventory, accounting
Data base management system	Yes	Yes	Yes	Yes	Yes
File access methods supported	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index seq.	Index sequential
Software separately priced	Yes	Yes	Yes	Yes	Some
Technical help separately priced	Yes	Yes	Yes	Yes	No
PRICING & AVAILABILITY					
Purchase price of basic system, $	$36,995	$39,995	$45,000	$75,000	$37,500
Monthly rental of basic system, $	Purchase only	Purchase only	Purchase only	Purchase only	Purchase only
Date of first U.S. delivery	1973	1973	1973	1976	May 1976
Number installed in U.S. to date	30	40	NA	NA	12
COMMENTS	Turnkey system	Turnkey system	Full turnkey system and support available	Full turnkey system and support available	Turnkey system; user has choice of 1 of 8 inventory management packages included with system

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Nixdorf 8870	Norfield Datasystems (Nova-based system)	Norfield Datasystems (Eclipse-based system)	Northrop Data Systems BDS 700	Northrop Data Systems BDS 1000
DATA FORMATS					
Word length, bits	16	16	16	Variable, 8-32	Variable, 8-32
Decimal digits per word	4	2	4	1-7	1-7
Bytes (characters) per word	2	2	2	1-4	1-4
Operand length, words	1	1, 2	½, 1, 2	Variable	Variable
Instruction length, words	1	1	1, 2	Variable	Variable
CPU					
Model	DCC 116-H	DG Nova	DG Eclipse C/300	Microdata 1600	Microdata 1600
Add time, microseconds	1.0 (1 word)	0.800 (1 word)	0.600 (1 word)	9.68 (7 digits)	9.68 (7 digits)
No. of programmable registers	4	5	12	16	16
No. of I/O ports on basic system and maximum	17	3, 62	3, 59	4, 16	4, 16
INTERNAL STORAGE					
Type	Core	Core	Core	Core	Core
Capacity of basic system, bytes	64K	32K	32K	16K	16K
Maximum capacity, bytes	128K	256K	128K	64K	64K
Increment size, bytes	32K	16K	16K	8, 16K	8, 16K
Cycle time, microseconds	0.96	0.800	0.800	1.0	1.0
Access time, microseconds	0.48	0.400	0.400	—	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	No	No	No
Cartridge disk drive	Std., 40M bytes	Std.; 2.5M bytes	Std.; 2.5M bytes	Std.; 10M bytes	Std., 10M bytes
Pack disk drive	No	Opt.; 200M bytes	Opt.; 200M bytes	No	No
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Optional	Optional	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 300 cps	Opt.; 400 cps	Opt.; 400 cps	No	No
Paper tape punch	Opt.; 75 cps	Opt.; 63 cps	Opt.; 63 cps	No	No
Punched card reader	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm
Punched card punch	No	No	No	No	No
Punched card reader/punch	No	No	No	No	No
Serial printer	Std.; 165 cps	Opt.; 100-420 cps	Opt.; 100-420 cps	Opt.; 30-120 cps	Opt.; 30-120 cps
Line printer	Opt.; 300, 600 lpm	Opt.; 300, 600 lpm	Opt.; 300, 600 lpm	Std.; 200 lpm	Std., 200 lpm
Reel-to-reel tape drive	Opt.; 10, 20 KBS	Opt.; 20-72 KBS	Opt.; 20-72 KBS	Opt.; 20 KBS	Opt.; 20 KBS
Cassette tape drive	No	Opt.; 750 cps	Opt.; 750 cps	No	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Standard, 27 x 74 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	9	32 (typical)	128 (typical)	4	4
Synchronous	Optional	Opt.; 50K bps	Opt.; 50K bps	No	No
Asynchronous	Std ; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Std.; to 1200 bps	Std.; to 1200 bps
Protocols supported	Various	IBM 2780, 3780, 2260; all async	IBM 2780, 3780, 2260; all async	None	None
SOFTWARE SUPPORT					
COBOL	No	No	Yes	No	No
RPG	No	No	Yes	No	No
FORTRAN	No	Yes	Yes	No	No
BASIC	Yes	Yes	Yes	Yes	Yes
Assembler	Yes	Yes	Yes	Yes	Yes
Other programming languages	None	None	None	None	None
Multiprogramming	Yes	Yes; 2 partitions	Yes	Yes; 3 partitions	Yes; 3 partitions
Language implemented in firmware	No	No	Fully	Partially	Partially
Operating system implemented in firmware	No	No	No	Partially	Partially
General accounting packages	Yes; APL, GL, Pay.	No	No	Yes	Yes
Industry application areas	Distribution, medical, garment	Automated reporting, order entry	Automated reporting, order entry	Hospital, medical, furniture manuf.	Hospital, medical, furniture manuf.
Data base management system	No	Yes	Yes	Yes	Yes
File access methods supported	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index seq	Random, sequential, index seq.
Software separately priced	Yes	Yes	Yes	Yes	Yes
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$37,990	$35,000	$75,000	$38,900	$49,276
Monthly rental of basic system, $	$851	$1,250	$3,000	Purchase only	Purchase only
Date of first U.S. delivery	1975	June 1973	NA	March 1977	June 1972
Number installed in U.S. to date	NA	Over 20	NA	NA	20
COMMENTS	Turnkey system that includes NIDAS distribution accounting system	Automated reporting system for organizations with multiple dispersed operations		Number of CRT's is limited to two	

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Olivetti A4	Olivetti A5 Model 10	Olivetti A5 Model 20	Olivetti A5 Model 30	Olivetti A6
DATA FORMATS					
Word length, bits	8-bit byte	64	64	64	64
Decimal digits per word	2 per byte	15	15	15	15
Bytes (characters) per word	1 per byte	8	8	8	8
Operand length words	---	8 bits	8 bits	8 bits	8 bits
Instruction length, words	1, 2 bytes	4 instr word	4 instr word	4 instr word	4 instr word
CPU					
Model	Olivetti 4000	Olivetti 5010	Olivetti 5020	Olivetti 5030	Olivetti 5040
Add time, microseconds	150 milliseconds	10	10	10	10 (word)
No. of programmable registers	10	47	111, 229, 485	111, 229, 485	229, 485
No. of I/O ports on basic system and maximum	1	2	2	2	4
INTERNAL STORAGE					
Type	MOS	MOS	MOS	MOS	MOS
Capacity of basic system, bytes	224	0.5K	1K	1K	2K
Maximum capacity, bytes	224	4K	4K	4K	4K
Increment size, bytes	—	1K, 2K	1K, 2K	1K, 2K	2K
Cycle time, microseconds	5 milliseconds	1.5	1.5	1.5	1.5
Access time, microseconds	---	—	—	—	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	No	No	Opt.. 1.2M bytes
Cartridge disk drive	No	No	No	No	No
Pack disk drive	No	No	No	No	No
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	No	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	Standard	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	No	No	Opt.; 20 cps	Opt., 20 cps
Paper tape punch	Opt.; 24 cps	Opt., 24 cps	Opt.; 24 cps	Opt.; 24 cps	Opt., 24 cps
Punched card reader	No	No	No	No	No
Punched card punch	No	No	No	No	No
Punched card reader/punch	No	No	No	No	No
Serial printer	Std.; 16 cps	Std.; 16 cps	Std., 16 cps	Std., 16 cps	Std., 16 cps
Line printer	No	No	No	Opt., 60 lpm	Opt.; 60-130 lpm
Reel-to-reel tape drive	No	No	No	No	No
Cassette tape drive	Opt., 1000 cps	Opt.. 1000 bps	Opt., 1000 bps	Opt., 1000 bps	Opt.. 1000 cps
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	Optional
CRT	No	No	No	No	No
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	None	1	1	1	1
Synchronous	No	Opt., to 4800 bps	Opt.; to 4800 bps	Opt., to 4800 bps	Opt., to 4800 bps
Asynchronous	No	Opt.; to 1200 bps	Opt. to 1200 bps	Opt.; to 1200 bps	Opt., to 1200 bps
Protocols supported	None	IBM 2848, 2260, 2780	IBM 2848, 2260, 2780	IBM 2848, 2260, 2780	IBM 2848, 2260, 2780
SOFTWARE SUPPORT					
COBOL	No	No	No	No	No
RPG	No	No	No	No	No
FORTRAN	No	No	No	No	No
BASIC	No	No	No	No	No
Assembler	No	Yes	Yes	Yes	Yes
Other programming languages	BAL	APLO	APLO	APLO	APCO
Multiprogramming	No	No	No	No	No
Language implemented in firmware	Fully	Fully	Fully	Fully	Fully
Operating system implemented in firmware	Fully	No	No	No	Partially
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Credit union, finan.. fuel oil	Credit union, educ., distrib.	Credit union, educ., distrib	Credit union, educ., distrib.	Whlsl. dist., credit unions, educ.
Data base management system	No	No	No	No	No
File access methods supported	None	None	None	None	Random, sequential, index sequential
Software separately priced	Yes	Yes	Yes	Yes	Yes
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$2,395	$4,900	$6,600	$7,150	$8,820
Monthly rental of basic system, $	$86.45 (3-yr. lease)	$177 (3-yr. lease)	$232 (3-yr. lease)	$252 (3-yr. lease)	$310 (3-yr. lease)
Date of first U.S. delivery	November 1975	February 1975	February 1975	February 1975	January 1976
Number installed in U.S. to date	Over 2,000	NA	NA	NA	NA
COMMENTS		Integral mag card unit allows mag cards to be used for program storage and data I/O	Integral mag card unit allows mag cards to be used for program storage and data I/O	Integral mag card unit allows mag cards to be used for program storage and data	Integral mag card unit allows mag cards to be used for program storage and data

*"Std" means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Olivetti A7 (7072 CPU)	Olivetti A7 (7074 CPU)	Pako Corp. Pricing System	Pako Corp. Pricing/ Invoicing System	Philips P310
DATA FORMATS					
Word length, bits	8-bit byte	8-bit byte	16	16	8-bit byte
Decimal digits per word	2 per byte	2 per byte	4	4	1 per byte
Bytes (characters) per word	1 per byte	1 per byte	2	2	1 per byte
Operand length, words	1-3 bytes	1-3 bytes	1	1	Variable
Instruction length, words	1, 2 bytes	1, 2 bytes	1, 2	1, 2	Variable
CPU					
Model	Olivetti 7072	Olivetti 7074	CAI LSI-2/20	CAI LSI-2/20	Philips 310
Add time, microseconds	6.1	6.1	25 (8 digits)	25 (8 digits)	—
No. of programmable registers	—	—	2	2	8
No. of I/O ports on basic system and maximum	16	16	—	—	10
INTERNAL STORAGE					
Type	MOS	MOS	Core	Core	Core
Capacity of basic system, bytes	16K	16K	16K	24K	8K
Maximum capacity, bytes	48K	48K	64K	64K	16K
Increment size, bytes	8K	8K	8K	8K	8K
Cycle time, microseconds	0.9	0.9	1.2	1.2	1.5
Access time, microseconds	—	—	—	—	0.6
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	Std.; 512K bytes	Opt.; 500K bytes	No	Opt.; 1.024M bytes
Cartridge disk drive	Opt. 40M bytes	Opt.; 40M bytes	No	Std.; 10M bytes	No
Pack disk drive	No	No	No	No	No
Fixed-head disk/drum	Opt.; 160K bytes	Opt.; 160K bytes	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	No	Standard	Standard
10-key numeric keyboard	Standard	Standard	Standard	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 20 cps	Opt.; 20 cps	Opt.; 150 cps	No	No
Paper tape punch	Opt.; 24 cps	Opt.; 24 cps	Opt.; 75 cps	Opt.; 75 cps	Opt.; 50 cps
Punched card reader	Opt.; 400 cpm	Opt.; 400 cpm	Opt.; 300 cpm	Opt.; 300 cpm	No
Punched card punch	No	No	Opt.; 23 cpm	Opt; 23 cpm	Opt.; 50 cpm
Punched card reader/punch	No	No	No	No	No
Serial printer	Std.; 40 cps	Std.; 40 cps	No	No	Std.; 50 cps
Line printer	Opt.; 130-600 lpm	Opt.; 130-600 lpm	No	Std.; 125-300 lpm	Opt.; 70 lpm
Reel-to-reel tape drive	No	No	Optional	Optional	No
Cassette tape drive	Std.; 1000 bps	Opt.; 1000 bps	No	No	Opt.; 1000 cps
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	Optional	Optional	No	No	Optional
CRT	16-char. alpha-numeric display	16-char. alpha-numeric display	No	Optional; 24 x 80 char.	No
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	1	1	1	1	1
Synchronous	Opt. to 9600 bps	Opt. to 9600 bps	Opt.; to 2400 bps	Opt.; to 2400 bps	Opt.; to 9600 bps
Asynchronous	Opt. to 1200 bps	Opt. to 1200 bps	No	No	Opt.; to 2400 bps
Protocols supported	Bisync	Bisync	IBM 2780	IBM 2780	IBM 2780
SOFTWARE SUPPORT					
COBOL	No	No	No	No	No
RPG	Yes	Yes	No	No	No
FORTRAN	No	No	No	No	No
BASIC	No	No	No	No	No
Assembler	Yes	Yes	No	No	Yes
Other programming languages	PL/1	PL/1	None	None	None
Multiprogramming	Yes; 2 partitions	Yes; 2 partitions	Yes; 10 partitions	Yes; 15 partitions	No
Language implemented in firmware	Fully	Fully	No	No	Partially
Operating system implemented in firmware	Partially	Partially	No	No	Partially
General accounting packages	Yes	Yes	No	No	Yes
Industry application areas	Whsl. dist., contractors	Whsl. dist., contractors	Photofinishing	Photofinishing	Banking, insur., medical, utilities
Data base management system	Yes	Yes	Yes	Yes	No
File access methods supported	Random, sequential, index sequential	Random, sequential, index sequential	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index seq.
Software separately priced	Yes	Yes	Yes	Yes	Yes
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$12,935	$14,885	$29,505	$76,404	$7,500-$14,000
Monthly rental of basic system, $	$455 (3-yr. lease)	$524 (3-yr. lease)	Purchase only	Purchase only	$170-$315
Date of first U.S. delivery	March 1975	March 1975	June 1975	June 1975	June 1975
Number installed in U.S. to date	NA	NA	NA	NA	750 (P300 Series)
COMMENTS			Includes pricing terminal (8 opt.) with bar code reader & keyboard; bar code is read & pricing info. printed on customer envelope	Same as pricing system with added capability for state-ments, invoices, and other management reports	Another 1500 P300's have been installed worldwide

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Philips P320	Philips P350	Prime 300	Prime 400	Prime 500
DATA FORMATS					
Word length, bits	8-bit byte	64	16 + 2	16 + 2 or 6 (ECC)	16 + 6 (ECC)
Decimal digits per word	1 per byte	15	2	2	2
Bytes (characters) per word	1 per byte	8	2	2	2
Operand length, words	Variable	1	1-4	1-4	1-4
Instruction length, words	Variable	1	1, 2, 3	1, 2, 3	1, 2, 3
CPU					
Model	Philips 320	Philips 350	Prime 300	Prime 400	Prime 500
Add time, microseconds	—	—	1.56	0.56	0.56
No. of programmable registers	8	Software-assigned	8	14	17
No. of I/O ports on basic system and maximum	10	16	10	64	64
INTERNAL STORAGE					
Type	Core	Core	MOS	MOS	MOS
Capacity of basic system, bytes	8K	12.8K	64KB	128K	256K
Maximum capacity, bytes	16K	19.2K	512KB	8 million	8 million
Increment size, bytes	8K	6.4K	64K, 256K	128K, 256K	256K
Cycle time, microseconds	1.5	1.5	0.76	0.76	0.76
Access time, microseconds	0.6	0.6	0.60	0.60	0.60
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Opt.; 1.024M bytes	No	Opt.; 2.4M bytes	Opt.; 2.4M bytes	Opt.; 2.4M bytes
Cartridge disk drive	No	Opt.; 9.2M bytes	Opt.; 48M bytes	Opt.; 48M bytes	Opt.; 48M bytes
Pack disk drive	No	No	Opt.; 2400M bytes	Opt.; 2400M bytes	Opt.; 2400M bytes
Fixed-head disk/drum	No	No	Opt.; 8 million	Opt.; 8 million	Opt.; 8 million
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	Optional	Optional	Optional
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	Opt.; 50 cps	Opt.; 200 cps	Opt.; 200 cps	Opt.; 200 cps
Paper tape punch	Opt.; 50 cps	Opt.; 50 cps	Opt.; 75 cps	Opt.; 75 cps	Opt.; 75 cps
Punched card reader	No	Opt.; 280 cpm	Opt.; 285 cpm	Opt.; 285 cpm	Opt.; 285 cpm
Punched card punch	Opt.; 50 cpm	Opt.; 50 cpm	No	No	No
Punched card reader/punch	No	No	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm
Serial printer	Std.; 50 cps	Std.; 40 cps	Opt.; 165 cps	Opt.; 165 cps	Opt.; 165 cps
Line printer	Opt.; 70 lpm	Opt.; 120-600 lpm	Opt.; 1220 lpm	Opt.; 1220 lpm	Opt.; 1220 lpm
Reel-to-reel tape drive	No	No	Opt.; 120 KBS	Opt.; 120 KBS	Opt.; 120 KBS
Cassette tape drive	Opt.; 1000 cps	Opt.; 1000 cps	No	No	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	Standard	Standard	No	No	No
CRT	No	No	Opt.; 24 x 80 char.	Opt.; 24 x 80 char.	Opt.; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	1	1	64	64	64
Synchronous	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; 56K bps	Opt.; 56K bps	Opt.; 56K bps
Asynchronous	Opt.; to 2400 bps	Opt.; to 2400 bps	Opt.; 19.2K bps	Opt.; 19.2K bps	Opt.; 19.2K bps
Protocols supported	IBM 2780	IBM 2780	2780, HASP, UT200	2780, HASP, UT200	2780, HASP, UT200
SOFTWARE SUPPORT					
COBOL	No	No	Yes	Yes	Yes
RPG	No	No	Yes	Yes	Yes
FORTRAN	No	No	Yes	Yes	Yes
BASIC	No	No	Yes	Yes	Yes
Assembler	Yes	Yes	Yes	Yes	Yes
Other programming languages	None	None	Forms	Forms	Forms
Multiprogramming	No	No	Yes, 31	Yes, 63	Yes, 63
Language implemented in firmware	Partially	No	Partially	Partially	Partial
Operating system implemented in firmware	Partially	No	Partially	Partially	Partial
General accounting packages	Yes	Yes	No	No	No
Industry application areas	Banking, insur., medical, utilities	Banking, insur., medical, utilities	Graphics, statistics	Graphics, statistics	Graphics, statistics
Data base management system	No	No	No	Yes	Yes
File access methods supported	Random, sequential, index seq.	Random, sequential, index seq.	Sequential, random, index sequential	Sequential, random, index sequential	Sequential, random, index sequential
Software separately priced	Yes	Yes	Yes	Yes	Yes
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$14,000-$19,000	$15,500-$26,500	$21,500	$69,600	$130,000
Monthly rental of basic system, $	$315-$430	$350-$600	$473 (5-yr. lease)	$1,524 (5-yr. lease)	$2,847 (5-yr. lease)
Date of first U.S. delivery	June 1975	June 1970	February 1973	2nd qtr. 1976	3rd qtr. 1977
Number installed in U.S. to date	750 (P300 series)	2300	450	200	10
COMMENTS	Another 1500 P300's have been installed worldwide	Another 20,000 P350's have been installed worldwide	Each user has 128K bytes of virtual address space	Each user has 512 million bytes of virtual address space	Each user has 512 million bytes of virtual address space; includes fast floating-point business instruction set hardware

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Programmed Control Corp. Prophet 21 Model 1	Programmed Control Corp. Prophet 21 Model 2	Q1 Corporation Q1/LMC	Q1 Corporation Q1/LITE	Qantel 900, 950
DATA FORMATS					
Word length, bits	16	16	8-bit byte	8	8
Decimal digits per word	4	4	2 per byte	2	2
Bytes (characters) per word	2	2	1 per byte	1	1
Operand length, words	1	1	1, 2 bytes	1, 2	Variable
Instruction length, words	2	1-3	1-3 bytes	3	3-10
CPU					
Model	TI 960B	TI 990/10	8080	Q1/LITE	Qantel std. CPU
Add time, microseconds	3.6 (word)	2.8 (word)	2	—	—
No. of programmable registers	16	16	7	4	17 in memory
No. of I/O ports on basic system and maximum	1, 22	1, 128	11, 32	64; 256	6
INTERNAL STORAGE					
Type	MOS	MOS	MOS	MOS	MOS
Capacity of basic system, bytes	32K	32K	8K	16K; 6K ROM	32K
Maximum capacity, bytes	128K	2048K	64K	64K	64K
Increment size, bytes	8K	8K	8, 16K	16K	8K
Cycle time, microseconds	0.7	0.7	0.5	0.35	1.5
Access time, microseconds	—	—	0.3	0.25	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	Std.; 1.2M bytes	Std.; 500K bytes	No
Cartridge disk drive	Std.; 5M bytes	Std.; 50M bytes	Opt.; 24M bytes	No	Std.; 6-36M bytes
Pack disk drive	No	Opt.; 5M bytes	No	Opt.; 54M bytes	No
Fixed-head disk/drum	No	No	No	Opt.; bubble memory	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	Standard	Standard	Standard
Full accounting keyboard	No	No	No	Standard	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	No	No	No	No
Paper tape punch	No	No	No	No	No
Punched card reader	No	No	No	No	Opt., 500 cpm
Punched card punch	No	No	No	No	No
Punched card reader/punch	No	No	No	Std.; 45 cps	No
Serial printer	Std.; 30 cps	Std.; 165 cps	Std.; 45-200 cps	Std.; 40 cps	Std.; 165 cps
Line printer	Opt.; 250 lpm	Opt.; 250 lpm	Opt.; 300 lpm	Opt.; 300 lpm	Opt.; 300-600 lpm
Reel-to-reel tape drive	No	No	No	No	Opt.; 36-72 KBS
Cassette tape drive	No	No	No	No	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 6 x 40 char.	Plasma display; 12 x 47 char.	Std.; 27 x 64 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	—	—	8	16	1
Synchronous	No	No	Opt.; to 2400 bps	Std.; to 4800 bps	Opt.; to 50K bps
Asynchronous	Opt.; to 1200 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Std.; to 1200 bps	Opt.; to 38,400 cps
Protocols supported	None	None	IBM 3741	IBM 2780 Bisync	HASP
SOFTWARE SUPPORT					
COBOL	No	No	No	No	No
RPG	No	No	No	No	No
FORTRAN	No	No	No	No	No
BASIC	No	No	No	No	No
Assembler	No	No	Yes	Yes	Yes
Other programming languages	Prophet 21	Prophet 21	PL/1	PL/1	QICBASIC
Multiprogramming	Yes; 22 partitions	Yes; 128 partitions	Yes	Multiprocessing	Yes; 5 partitions
Language implemented in firmware	No	No	Partially	PL/1 interpreter	Partially
Operating system implemented in firmware	No	No	Fully	Fully	Partially
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Industrial dist. & wholesalers	Industrial dist. & wholesalers	Acctg., credit unions, word proc.	Credit unions, banks, gen'l. bus., wd. proc.	Whlsl. dist., medical clinics
Data base management system	Yes	Yes	Yes	—	No
File access methods supported	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential	ISAM, KSAM	Random, sequential, index sequential
Software separately priced	No	No	No	Yes	Some
Technical help separately priced	No	No	No	No	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$42,500	$42,500	$17,950	$21,000	$27,900
Monthly rental of basic system, $	Purchase only	Purchase only	Purchase only	NA	NA
Date of first U.S. delivery	1972	January 1978	1975	July, 1977	1st qtr., 1975
Number installed in U.S. to date	20	NA	200	NA	—
COMMENTS	Turnkey system is marketed nationwide	Turnkey system is marketed nationwide	A 24 x 80 char. CRT is optionally available; up to 4 CRT/workstations per system	Std. config. for data and wd. proc., data entry, prog. calc., intel. ter., graphics. Up to 64 intelligent workstations can share data base	Program and report generating packages; up to 16 on-line terminals

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Qantel 1400	Qantel 1400-2	Randal Data Systems Link-100	Randal Data Systems Link-200	Randal Data Systems Link-500
DATA FORMATS					
Word length, bits	8	8	16	16	16
Decimal digits per word	2	2	4	4	4
Bytes (characters) per word	1	1	2	2	2
Operand length, words	Variable	Variable	Variable	Variable	Variable
Instruction length, words	3-10	3-10	1, 2, 3	1, 2, 3	1, 2, 3
CPU					
Model	Qantel high-per-formance CPU	Qantel high-per-formance CPU	Randal-100	Randal-200	Randal-500
Add time, microseconds	—	—	1.2	1.2	1.2 (5 digits)
No. of programmable registers	6 + 17 in memory	6 + 17 in memory	4	4	4
No. of I/O ports on basic system and maximum	12	12	63 max.	63 max.	63 max.
INTERNAL STORAGE					
Type	MOS	MOS	MOS	MOS	MOS
Capacity of basic system, bytes	40K	48K	32K	32K	64K bytes
Maximum capacity, bytes	128K	128K	64K	64K	128K bytes
Increment size, bytes	8K	8K	16K	16K	32K bytes
Cycle time, microseconds	1.1	1.1	0.3	0.3	0.3
Access time, microseconds	—	—	0.3	0.3	0.3
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	Std.; 2.5M bytes	No	Std.; 1.2M bytes
Cartridge disk drive	Std.; 12-48MB	Opt.; 12-48MB	No	Std.; 10M bytes	No
Pack disk drive	Opt.; 25-600MB	Std.; 25-600MB	No	No	Std.; 200M bytes
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	Standard	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	No	No	No	No
Paper tape punch	No	No	No	No	No
Punched card reader	Opt.; 500 cpm	Opt.; 500 cpm	Opt.; 450 cpm	Opt.; 450 cpm	450 cpm
Punched card punch	No	No	No	No	No
Punched card reader/punch	No	No	No	No	No
Serial printer	Std.; 165 cps	Std.; 165 cps	Opt.; 30, 55, 180 cps	Opt.; 30, 55, 180 cps	Std.; 180 cps
Line printer	Std.; 300-600 lpm	Std.; 300-600 lpm	Opt.; 300 lpm	Opt.; 300 lpm	Opt.; 300 lpm
Reel-to-reel tape drive	Opt.; 36-72 KBS	Std.; 36-72 KBS	Opt.; 10 KBS	Opt.; 10 KBS	Opt.; 10K cps
Cassette tape drive	No	No	No	No	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Std.; 27 x 64 char.	Std.; 27 x 64 char.	Std.; 12 x 80 char.	Std.; 12 x 80 char.	Std.; 12 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	4	4	2	8	16
Synchronous	Opt.; to 50K bps	Opt.; to 50K bps	Opt.; 9600 bps	Opt.; 9600 bps	Opt.; 9600 bps
Asynchronous	Opt.; to 38,400 cps	Opt.; to 38,400 cps	Opt.; 9600 bps	Opt.; 9600 bps	Opt.; 9600 bps
Protocols supported	HASP	HASP	IBM 2780, Univac DCT 1000	IBM 2780, Univac DCT 1000	IBM 2780, DCT 1000
SOFTWARE SUPPORT					
COBOL	No	No	No	No	No
RPG	No	No	No	No	No
FORTRAN	No	No	No	No	No
BASIC	No	No	Yes	Yes	Yes
Assembler	Yes	Yes	Yes	No	Yes
Other programming languages	QICBASIC	QICBASIC	—	None	—
Multiprogramming	Yes; 30 partitions	Yes; 30 partitions	Yes; 2 users	Yes; 16 partitions	Yes
Language implemented in firmware	Partially	Partially	No	No	No
Operating system implemented in firmware	Partially	Partially	No; Timeshare OS	No; Timeshare OS	No
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Whlsl. dist., medical clinics	Whlsl. dist., medical clinics	Lumber industry; med., dental mgmt.	Lumber industry; med., dental mgmt.	Distribution, medical, accounting
Data base management system	No	No	No	No	No
File access methods supported	Random, sequential, index sequential	Random, sequential, index sequential	Formatted, text, index sequential	Formatted, text, index sequential	Formatted, text, index sequential
Software separately priced	Some	Some	Yes	Yes	Yes
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$43,900	$64,900	$12,750	$24,506	$45,900
Monthly rental of basic system, $	—	—	$280	$551	$1,000
Date of first U.S. delivery	2nd qtr. 1977	2nd qtr. 1977	October 1975	August 1976	October 1977
Number installed in U.S. to date			200	NA	0
COMMENTS	Program and report generating packages; up to 64 on-line terminals	Program and report generating packages; up to 64 on-line terminals	Marketed exclusively through qualified distributors	Marketed exclusively through qualified distributors	Marketed exclusively through qualified distributors

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Raytheon PTS/1200	Shasta General Systems Diablo 3200	A. O. Smith Mesa Two 7000 Series	Span Management Systems	Sperry Univac BC/7
DATA FORMATS					
Word length, bits	16	8 + parity	16	16	8
Decimal digits per word	2	2	4, 9	2	2
Bytes (characters) per word	2	1	2	2	1
Operand length, words	½, 1, 1½	1 or 2	1	Variable	1
Instruction length, words	1, 2	1-3	1	1	1, 2, 3
CPU					
Model	Raytheon PTS/1200	Diablo 3200	DG Nova 3	IBM Series/1	Univac T3038
Add time, microseconds	2.8 (1 word)	23.9/6 digits	—	—	106 (5 digits)
No. of programmable registers	4	7	4	8	7
No. of I/O ports on basic system and maximum	42	22; 256	4; 16	8; 256	3; 12
INTERNAL STORAGE					
Type	MOS	MOS	Core	MOS	MOS
Capacity of basic system, bytes	48K	16	64K	16K	32K
Maximum capacity, bytes	128K	65	256K	128K	64K
Increment size, bytes	16K	4K, 8K, 12K, 16K	64K	16K	16K
Cycle time, microseconds	1.28	0.488	1.0	0.660	1.0
Access time, microseconds	0.80	0.300	—	0.300	0.5
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	Std.; 2M bytes	No	Opt.; 606K bytes	Std.; 2M bytes
Cartridge disk drive	Std.; 40M bytes	Opt.; 10M bytes	No	—	Opt.; 40M bytes
Pack disk drive	No	No	Std.; 320M bytes	Opt.; 13.9M bytes	No
Fixed-head disk/drum	No	No	No	Opt.; 9.4M bytes	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Optional	Standard
10-key numeric keyboard	Optional	Standard	Standard	Optional	Standard
Full accounting keyboard	No	No	No	Optional	—
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	No	No	No	No
Paper tape punch	No	No	No	No	No
Punched card reader	Opt.; 300 cpm	No	No	No	Opt.; 300, 600 cpm
Punched card punch	No	No	No	No	No
Punched card reader/punch	No	No	No	No	No
Serial printer	Opt.; 15-165 cps	Std.; 45, 55, 200 cps	Std.; 165 cps	Opt.; 120 cps	Std.; 200 cps
Line printer	Opt.; 300 lpm	No	Std.; 300-600 lpm	Opt.; 414 lpm	Opt.; 125, 250 lpm
Reel-to-reel tape drive	Std.; 800 bpi	No	Opt.; 800 bpi	No	Opt.; 20, 40 KBS
Cassette tape drive	Std.; 600 bytes/sec.	No	No	No	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Opt.; 480 to 1920 char.	Std.; 24 x 80 char.	Std.; 23 x 74 char.	Opt.; 24 x 80 char.	Std.; 1920 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	1	9	16	—	2
Synchronous	Std.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 4800 bps	Optional	Std.; to 9600 bps
Asynchronous	Std.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 1200 bps	Optional	No
Protocols supported	IBM 2780, 3780	IBM 2780	IBM 3780, HASP	Bisync, SDLC	Transparent
SOFTWARE SUPPORT					
COBOL	No	No	No	No	No
RPG	No	No	Yes	No	Yes
FORTRAN	No	No	No	No	No
BASIC	No	No	No	No	No
Assembler	No	Yes	No	Yes	No
Other programming languages	MACROL	DACL	Mesa RPG II, FPG	No	ESCORT
Multiprogramming	Yes; 20 partitions	Yes	Yes; 2 partitions	Yes	Yes; 2 partitions
Language implemented in firmware	No	No	No	No	Partially
Operating system implemented in firmware	No	No	No	No	No
General accounting packages	No	Yes	Yes	Yes	Yes
Industry application areas	Transport., insurance, finance	Whlsl., dist., med., finan., gen'l. acct'g.	Distribution, manufacturing	Many	Distribution, manufacturing
Data base management system	Yes	No	Yes	Yes	No
File access methods supported	Random, sequential, index seq.	Random, sequential, index sequential	Random, sequential, index seq.	IAM	Random, sequential, index seq.
Software separately priced	No	No	No	Yes	Partly
Technical help separately priced	No	Yes	No	Yes	Partly
PRICING & AVAILABILITY					
Purchase price of basic system, $	$30,580	$18,950	$56,700	$35,000	$17,283
Monthly rental of basic system, $	$830 (3-yr. lease)	Various	Lease available	$1,167 (1-yr. lease)	$385
Date of first U.S. delivery	November 1974	December 1976	May 1977	June 1977	March 1977
Number installed in U.S. to date	100	50	5	NA	NA
COMMENTS	Display-oriented distributed system. Applications also in RJE, data entry, 3270 emulation	DACL compiler language is high level English-like language source statement compiler	System designed for data base management with remote job entry	System features sophisticated time-shared operating system on IBM hardware; vendor provides turnkey systems	Interactive applications; high-level ESCORT language provides both direct and tutorial programming modes; see Report M11-877-401 for details

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	STC Systems Ultimacc 2010	STC Systems Ultimacc 3010	STC Systems Ultimacc 3080	STC Systems Ultimacc 3300	Sycor 410
DATA FORMATS					
Word length, bits	16	16	16	16	8
Decimal digits per word	4	4	4	4	1
Bytes (characters) per word	2.3	2.3	2.3	2.3	1
Operand length, words	½	½	½	½	1
Instruction length, words	1	1	1	1	1-5
CPU					
Model	DG Nova 3/12	Nova 3D	Nova 3D	Nova 3D	Sycor 410
Add time, microseconds	1.35	1	1	1	
No. of programmable registers	4	4	4	4	7
No. of I/O ports on basic system and maximum	20	60	60	60	16, 512
INTERNAL STORAGE					
Type	Core	Core	Core	Core	MOS
Capacity of basic system, bytes	32K	32K	32K	32K	40K
Maximum capacity, bytes	64K	256K	256K	256K	64K
Increment size, bytes	16K	32K	32K	32K	8K
Cycle time, microseconds	1.35	1	1	1	0.50
Access time, microseconds					0.25
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Optional	Optional	Optional	Optional	Opt.; 256K bytes
Cartridge disk drive	Std.; 10-40M bytes	Std.; 10-40M bytes	No	No	Std.; to 5M bytes
Pack disk drive	No	No	Std. 80-320M bytes	Std.; 300-1200M bytes	No
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	Standard	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Optional	Optional	Optional	Optional	Optional
Paper tape punch	Optional	Optional	Optional	Optional	No
Punched card reader	Optional	Optional	Optional	Optional	Opt.; 250 cpm
Punched card punch	Optional	Optional	Optional	Optional	No
Punched card reader/punch	Optional	Optional	Optional	Optional	No
Serial printer	Std.; 165 cps	Optional	Optional	Optional	Std.; to 180 cps
Line printer	Opt.; 300-600 lpm	Opt.; 300-900 lpm	Opt.; 300-900 lpm	Opt.; 300-900 lpm	Opt.; 300 lpm
Reel-to-reel tape drive	Opt.; 60 KBS	Opt.; 60 KBS	Opt.; 60 KBS	Opt.; 60 KBS	Opt.; 10,000 cps
Cassette tape drive	No	No	No	No	Std.; 1000 cps
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Std.; 24 x 80 char.	Std.; 24 x 80 char.	Std.; 24 x 80 char.	Std.; 24 x 80 char.	Std.; 576 char. per screen
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	Unlimited	Unlimited	Unlimited	Unlimited	2
Synchronous	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Std.; to 9600 bps
Asynchronous	Opt; to 1200 bps	Opt.; to 1200 bps	Opt.; to 1200 bps	Opt.; to 1200 bps	Opt.; to 1200 bps
Protocols supported	IBM 2780/3780, 3270	IBM 2780/3780, 3270	IBM 2780/3780, 3270	IBM 2780/3780, 3270	IBM 2770, 2780, 3780, HASP, TTY, RJE
SOFTWARE SUPPORT					
COBOL	Yes	Yes	Yes	Yes	Yes
RPG	No	No	No	No	No
FORTRAN	No	No	No	No	No
BASIC	Yes	Yes	Yes	Yes	Yes
Assembler	Yes	Yes	Yes	Yes	No
Other programming languages	ENGLISH 210	ENGLISH 210	ENGLISH 210	ENGLISH 210	TAL-2
Multiprogramming	Yes; 8 partitions	Yes; 50 partitions	Yes; 50 partitions	Yes; 50 partitions	Yes
Language implemented in firmware	No	No	No	No	No
Operating system implemented in firmware	No	No	No	No	No
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Mfg., banking, dist., govt., dist. proc.	Mfg., banking, dist., gov't., dist. proc.	Mfg., banking, dist., gov't., dist. proc.	Mfg., banking, dist., gov't., dist. proc.	Used in many industries
Data base management system	Yes	Yes	Yes	Yes	No
File access methods supported	Random, sequential, index sequential	Random, sequential, index sequential	Random, sequential, index sequential	Random, sequential, index sequential	Sequential, ISAM, random
Software separately priced	No	No	No	No	No
Technical help separately priced	No	No	No	No	No
PRICING & AVAILABILITY					
Purchase price of basic system, $	$41,000	$62,000	$75,000	$87,000	$25,230
Monthly rental of basic system, $	Purchase only	Purchase only	Purchase only	Purchase only	$553
Date of first U.S. delivery	1973	1975	1976	1976	May 1976
Number installed in U.S. to date	100	20	5	3	600
COMMENTS	Company was formerly called Ultimacc Systems, Inc.; turnkey system				Designed for transaction proc. in distributed or standalone environments; industry application software packages are available through Sycor's distributors

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Sycor 440	Tal-Star TDMS System	Tealtronic 2500	Terak 8510	Terak 8510A
DATA FORMATS					
Word length, bits	8	16	8-bit byte	16	16
Decimal digits per word	1	4	1 per byte	2	2
Bytes (characters) per word	1	2	—	2	2
Operand length, words	1	1	—	—	—
Instruction length, words	1-5	1, 2	4 bytes	1-3	1-3
CPU					
Model	Sycor 440	GA 18/30	Tealtronic 2500	DEC LSI-11	DEC LSI-11
Add time, microseconds	—	2.4	—	3.5	3.5
No. of programmable registers	7	16	26	8	8
No. of I/O ports on basic system and maximum	16; 512	—	32	2; 21	2; 21
INTERNAL STORAGE					
Type	MOS	Core	MOS	MOS, RAM	MOS, RAM
Capacity of basic system, bytes	24K	32K	20,480 bytes	24K	56K
Maximum capacity, bytes	64K	64K	65,536 bytes	56K	56K
Increment size, bytes	8K	8, 16K	4K, 8K, 16K	8K	—
Cycle time, microseconds	0.50	1.2	0.60	1.2	1.2
Access time, microseconds	0.25	—	—	0.6	0.6
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Opt.; 256K	Opt.; 300K bytes	Std.; 512K bytes	Std.; to 1024K bytes	Std.; to 1024K bytes
Cartridge disk drive	Std.; to 5M bytes	No	No	No	No
Pack disk drive	No	Std.; 20M bytes	No	No	No
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Optional	Standard
10-key numeric keyboard	Standard	Optional	Standard	Optional	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	Opt.; 400 cps	No	No	No
Paper tape punch	No	Opt.; 75 cps	No	No	No
Punched card reader	Opt.; 250 cpm	Std.; 400 cpm	No	No	No
Punched card punch	No	Opt.; 100 cpm	No	No	No
Punched card reader/punch	No	No	No	No	No
Serial printer	Opt.; to 180 cps	Std.; 10 cps	Opt.; 45, 165 cps	Opt.; 100 cps	Opt.; 100 cps
Line printer	Opt.; 300 lpm	Std.; 240 lpm	Opt.; 300 lpm	Opt.; 300 lpm	Opt.; 300 lpm
Reel-to-reel tape drive	Opt.; 10,000 cps	Opt.; 20-60 KBS	No	No	No
Cassette tape drive	Std.; 1000 cps	No	No	No	No
Cartridge tape drive	Opt.; to 24,000 cps	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Opt.; to 8,576 char. per screen	Opt.; 25 x 80 char.	Std.; 6 x 40 char.	Opt.; 80 x 24 char.	Opt.; 80 x 24 char. 240x320 dot graphics
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	2	15	1	4	4
Synchronous	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 4800 bps	No	No
Asynchronous	Opt.; to 1200 bps	Std.; to 1200 bps	No	Opt.; to 19.2K bps	Opt.; to 19.2K bps
Protocols supported	IBM 2770, 2780, 3780,HASP,TTY,RJE	None	IBM 2780	None	None
SOFTWARE SUPPORT					
COBOL	Yes	Yes	No	No	No
RPG	No	Yes	No	No	No
FORTRAN	No	Yes	No	Yes	Yes
BASIC	Yes	No	No	Yes	Yes
Assembler	No	Yes	Yes	Yes	Yes
Other programming languages	TAL-2	None	ACL	APL, AG/1	APL, AG/1
Multiprogramming	Yes	Yes; 2 partitions	No	Yes	Yes
Language implemented in firmware	No	No	Partially	No	No
Operating system implemented in firmware	No	No	Partially	No	No
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Used in many industries	Graphic arts, newspapers	—	Small business, education	Education, graphics
Data base management system	No	Yes	No	Yes	Yes
File access methods supported	Sequential, ISAM, random	Random, sequential, index sequential	Sequential	Random, sequential, index sequential	Random, sequential, index sequential
Software separately priced	No	Yes	Free	Yes	Yes
Technical help separately priced	No	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$25,670	$73,600	$9,900	$6,615	$7,225
Monthly rental of basic system, $	$641	Purchase only	NA	—	—
Date of first U.S. delivery	May 1976	1972	2nd qtr. 1977	June 1976	April 1977
Number installed in U.S. to date	600	NA	—	NA	NA
COMMENTS	Designed for transaction processing in distributed or stand-alone environments; industry application software packages are avail. through Sycor's distributors	System features on-line data base support; direct entry circulation system for publications with large files	ACL is compatible with the IBM 3741	Compatible with DEC RT-11 and standard DEC languages; compact, portable system	Features simultaneous graphics and character display; compact, portable system

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Vanguard Computer Systems V500	Vanguard Computer Systems V400	Wang 2200T	Wang WCS-20	Wang WCS-25
DATA FORMATS					
Word length, bits	16	16	8-bit byte	8-bit byte	8-bit byte
Decimal digits per word	2, 4	2, 4	1 per byte	1 per byte	1 per byte
Bytes (characters) per word	2	2	1 per byte	1 per byte	1 per byte
Operand length, words	1, 2, 3	1, 2, 3	1 byte	1 byte	1 byte
Instruction length, words	1, 2, 3	1, 2, 3	1 byte	1 byte	1 byte
CPU					
Model	Raytheon RDS500	Raytheon RDS500	Wang 2200T	Wang 2200T	Wang 2200T
Add time, microseconds	400 (18 digits)	400 (18 digits)	800 (13 digits)	800 (13 digits)	800 (13 digits)
No. of programmable registers	15	15	None	None	None
No. of I/O ports on basic system and maximum	6; 15	6; 15	6; 9	3; 9	6; 9
INTERNAL STORAGE					
Type	Core	Core	MOS	MOS	MOS
Capacity of basic system, bytes	65K	65K	16K	8K	24K
Maximum capacity, bytes	131K	65K	32K	32K	32K
Increment size, bytes	32K	—	4, 8K	8K	8K
Cycle time, microseconds	0.7, 0.9	0.9	1.6	1.6	1.6
Access time, microseconds	0.35	0.45	—	—	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Optional	Optional	Opt.; 786K bytes	Std.; 786K bytes	Std.; 524K bytes
Cartridge disk drive	Opt.; 40M bytes	Std.; 40M bytes	Opt.; 20M bytes	Opt.; 20M bytes	Opt.; 20M bytes
Pack disk drive	Std.; 3200M bytes	No	No	No	No
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Optional	Standard	Standard
10-key numeric keyboard	Standard	Standard	Optional	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	No	Opt.; 300 cps	Opt.; 300 cps	Opt.; 300 cps
Paper tape punch	No	No	Opt.; 50 cps	Opt.; 50 cps	Opt.; 50 cps
Punched card reader	Opt.; 200, 1000 cpm	No	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 30 cpm
Punched card punch	No	No	Opt.; 45 cpm	Opt.; 45 cpm	No
Punched card reader/punch	No	No	No	No	No
Serial printer	Std.; 30, 330 cps	Std.; 330 cps	Opt.; 200 cps	Opt.; 200 cps	Std.; 120 cps
Line printer	Std.; 300, 1250 lpm	No	Opt.; 250 lpm	Opt.; 250 lpm	Opt.; 600 lpm
Reel-to-reel tape drive	Std.; 30-200 KBS	No	Opt.; 10 KBS	Opt.; 10 KBS	Opt.; 10 KBS
Cassette tape drive	No	No	Opt.; 326 bps	Opt.; 326 cps	Opt.; 200 cps
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Optional; 16 x 64, 24 x 80 char.	Standard; 16 x 64 char.	Standard; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	32	None	1	4	4
Synchronous	Opt.; to 9600 bps	No	Opt.; to 4800 bps	Opt.; to 4800 bps	Opt.; to 4800 bps
Asynchronous	Std., 110-9600 bps	No	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Protocols supported	4th qtr. 1977	None	IBM 2780/3780, 2741, 3741	IBM 2780/3780, 2741, 3741	IBM 2780/3780, 2741, 3741
SOFTWARE SUPPORT					
COBOL	Yes	Yes	No	No	No
RPG	No	No	No	No	No
FORTRAN	No	No	No	No	No
BASIC	No	No	Yes	Yes	Yes
Assembler	No	No	No	No	No
Other programming languages	SPL	SPL	None	None	None
Multiprogramming	Yes; variable	Yes; variable	No	No	No
Language implemented in firmware	No	No	Fully	Fully	Fully
Operating system implemented in firmware	No	No	Partially	Partially	Partially
General accounting packages	No	No	Yes	Yes	Yes
Industry application areas	Inventory billing; customized only	Inventory billing; customized only	Mfg., dist., insur., banking	Mfg., dist., insur., banking	Mfg., dist., banking, insur., medical
Data base management system	Yes	No	No	Yes	Yes
File access methods supported	Direct, sequential linked, index seq.	Direct, sequential linked, index seq.	Random, sequential, index sequential	Random, sequential, index sequential	Random, sequential, index sequential
Software separately priced	Yes	No	Yes	Yes	Yes
Technical help separately priced	Yes	Yes	No	No	No
PRICING & AVAILABILITY					
Purchase price of basic system, $	$55,000-$250,000	$46,000	$6,400	$12,200	$26,750
Monthly rental of basic system, $	Third party	Third party	$156.80	$229 (5-yr. lease)	$655 (5-yr. lease)
Date of first U.S. delivery	March 1976	July 1977	January 1975	April 1975	August 1977
Number installed in U.S. to date	5	1	NA	NA	NA
COMMENTS	Terminal-oriented system supporting variable number of tasks; designed for ease of development and application; multi-CPU capability to 5 CPU's			Packaged system includes 16K 2200T, CRT/keyboard, and 262K-byte floppy disk drive	Pkgd. system includes 24K 2200T, 3 int. terminals, 2 diskette drives, 120-cps printer, & terminal access methods programs

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Wang WCS-30	Wang WCS-40	Warrex Computer Centurion I-A	Warrex Computer Centurion II	Warrex Computer Centurion IIA
DATA FORMATS					
Word length, bits	8-bit byte	8-bit byte	8	16	8
Decimal digits per word	1 per byte	1 per byte	2	2	2
Bytes (characters) per word	1 per byte	1 per byte	1	2	1
Operand length, words	1 byte	1 byte	1, 2	½, 1	1, 2
Instruction length, words	1 byte	1 byte	1, 2, 3	½, 1, 1½	1, 2, 3
CPU					
Model	Wang 2200T	Wang 2200MVP	CC-201	CC-202	CC-202
Add time, microseconds	800 (13 digits)	110 (13 digits)	3.6 (16 bits)	—	3.6 (16 bits)
No. of programmable registers	None	None	16	8	16
No. of I/O ports on basic system and maximum	3; 9	9	4; 12	3; 4	4; 12
INTERNAL STORAGE					
Type	MOS	MOS	MOS	MOS	MOS
Capacity of basic system, bytes	16K	32K	32K	16K	32K
Maximum capacity, bytes	32K	64K	60K	16K	60K
Increment size, bytes	8K	16K	8K, 16K, 32K	None	8K, 16K, 32K
Cycle time, microseconds	1.6	1.6	0.800	0.800	0.800
Access time, microseconds	—	—	—	—	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Std.; 786K bytes	Std.; 262K bytes	Std.; 616 bytes	No	Std.; 616 bytes
Cartridge disk drive	Std.; 20M bytes	Std.; 10M bytes	No	Std.; 41.6M bytes	No
Pack disk drive	No	No	No	No	Std.; 10.4-41.6MB
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	Standard	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 300 cps	Opt.; 300 cps	No	Opt.; 50 cps	No
Paper tape punch	Opt.; 50 cps	Opt.; 50 cps	No	No	No
Punched card reader	Opt.; 300 cpm	Opt.; 300 cpm	No	Opt.; 300 cpm	No
Punched card punch	Opt.; 45 cpm	No	No	No	No
Punched card reader/punch	No	No	No	No	No
Serial printer	Std.; 200 cps	Std.; 240 lpm	Optional	Std.; 175 cps	Optional
Line printer	Opt.; 250 lpm	Opt.; 600 lpm	Opt.; 125-600 lpm	Opt.; 125-600 lpm	Opt.; 125-600 lpm
Reel-to-reel tape drive	Opt.; 10 KBS	Opt.; 10 KBS	No	No	No
Cassette tape drive	Opt.; 326 cps	No	No	Opt.; 200 cps	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Std.; 16 x 64 char.	Std.; 24 x 80 char.	Std.; 24 x 80 char.	Std.; 24 x 80 char.	Std.; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	4	5	4, 12	1	4, 12
Synchronous	Opt.; to 4800 bps	Opt.; to 4800 bps	No	No	No
Asynchronous	Opt.; to 9600 bps	Opt.; to 9600 bps	Optional	Optional	Optional
Protocols supported	IBM 2780/3780, 2741, 3741	IBM 2780/3780, 2741, 3741	None	None	None
SOFTWARE SUPPORT					
COBOL	No	No	No	No	No
RPG	No	No	No	No	No
FORTRAN	No	No	No	Yes	No
BASIC	Yes	Yes	No	Yes	No
Assembler	No	No	Yes	Yes	Yes
Other programming languages	None	None	CPL I	CPL I	CPL I
Multiprogramming	No	No	Yes	No	Yes
Language implemented in firmware	Fully	Fully	No	No	No
Operating system implemented in firmware	Partially	Partially	No	No	No
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Mfg., dist., insur., banking	Mfg., dist., banking, insur., medical	Acct'g., route acct'g., inventory control	Oil/gas, medical acct'g., dist., banking	Acct'g., route acct'g., inven. control
Data base management system	Yes	Yes	No	Yes	No
File access methods supported	Random, sequential, index sequential	Random, sequential, index sequential	Random, sequential	Random	Random, sequential
Software separately priced	Yes	Yes	Some	Some	Some
Technical help separately priced	No	No	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$30,400	$48,950	Approx. $20,000	$26,950	Below $30,000
Monthly rental of basic system, $	$744.80 (5-yr. lease)	$1,200 (5-yr. lease)	Purchase/lease	Purchase only	Purchase/lease
Date of first U.S. delivery	April 1975	November 1977	2nd qtr., 1977	1975	2nd qtr., 1977
Number installed in U.S. to date	NA	NA	NA	NA	NA
COMMENTS	Packaged system includes 16K 2200T, CRT/keyboard, 262K-byte floppy disk drive, and 200-cps printer	Pkgd. system includes 32K 2200MVP, 3 int. terminals, 1 diskette drive, 10MB disk, 240-lpm serial printer, access methods programs			

*"Std. means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Warrex Computer Centurion III	Warrex Computer Centurion IV	Warrex Computer Centurion VI	Wintex Computer 200 NS Business Information System
DATA FORMATS				
Word length, bits	8	16	8	8
Decimal digits per word	2	2	2	1 or 2
Bytes (characters) per word	1	2	1	1
Operand length, words	1, 2	½, 1	1-256	1, 2, variable
Instruction length, words	1, 2, 3	½, 1, 1½	1-7	1-6
CPU				
Model	CC-203	CC-204	CC-206	Wintex microproc.
Add time, microseconds	3.6 (16 bits)	—	2.2 (16 bits)	1500 (5 digits)
No. of programmable registers	16	8	16	Unltd. (in memory)
No. of I/O ports on basic system and maximum	4; 12	4; 25	4; 64	256
INTERNAL STORAGE				
Type	MOS	MOS	MOS (error corr.)	MOS
Capacity of basic system, bytes	32K	32K	32K	8K
Maximum capacity, bytes	60K	60K	252K	64K
Increment size, bytes	8K, 16K, 32K	16K; 32K	8K, 16K, 32K	4K
Cycle time, microseconds	0.800	0.800	0.600	0.650
Access time, microseconds	—	—	—	—
MASS STORAGE CAPABILITIES*				
Floppy disk drive	Optional	No	Optional	Std.; 6M bytes
Cartridge disk drive	Std.; 10.4-41.6MB	Std.; 41.6M bytes	Std., 10.4-77.6MB	Opt.; 10-40M bytes
Pack disk drive	Optional	No	Optional	Optional
Fixed-head disk/drum	No	No	No	No
KEYBOARD INPUT*				
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	Standard	Standard
Full accounting keyboard	No	No	No	No
INPUT/OUTPUT DEVICES*				
Paper tape reader	Opt.; 120 cps	Opt.; 50 cps	Opt.; 120 cps	No
Paper tape punch	No	No	No	No
Punched card reader	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm	No
Punched card punch	No	No	No	No
Punched card reader/punch	No	No	No	No
Serial printer	Optional	Std.; 175 cps	Optional	No
Line printer	Std.; 125-600 lpm	Opt.; 125-600 lpm	Std.; 125-600 lpm	Std.; 66 lpm
Reel-to-reel tape drive	No	Optional	No	No
Cassette tape drive	No	Opt.; 200 cps	No	No
Cartridge tape drive	No	No	No	No
Magnetic ledger card device	No	No	No	No
CRT	Std.; 24 x 80 char.	Std.; 24 x 80 char.	Std.; 24 x 80 char.	Std.; 27 x 40 char.
COMMUNICATIONS CAPABILITIES*				
Maximum no. of lines	4, 12	8	4, 64	1
Synchronous	No	No	No	Under development
Asynchronous	Optional	Standard	Optional	Opt.; to 9600 bps
Protocols supported	None	None	None	None
SOFTWARE SUPPORT				
COBOL	No	No	No	No
RPG	No	No	No	No
FORTRAN	No	Yes	No	No
BASIC	No	Yes	No	Yes
Assembler	Yes	Yes	Yes	Yes
Other programming languages	CPL I	CPL I	CPL I, CPL II	None
Multiprogramming	Yes	Yes	Yes	Under development
Language implemented in firmware	No	No	Partially	Fully; assembler
Operating system implemented in firmware	No	No	Partially	Partially
General accounting packages	Yes	Yes	Yes	Yes
Industry application areas	Oil & gas acct'g., dist., banking, medical	Accounting, distribution	Oil & gas acct'g., dist., banking, medical	Distribution, professional services
Data base management system	No	No	No	No
File access methods supported	Random, sequential	Sequential	Random, sequential	Random, sequential, index sequential
Software separately priced	Some	Some	Some	Yes
Technical help separately priced	Yes	Yes	Yes	Some
PRICING & AVAILABILITY				
Purchase price of basic system, $	Below $40,000	$34,150	NA	$12,000
Monthly rental of basic system, $	Purchase/lease	Purchase only	Purchase/lease	—
Date of first U.S. delivery	1974	1975	1st qtr. 1978	January 1975
Number installed in U.S. to date	NA	NA	0	NA
COMMENTS				Two 300K-byte floppy disk drives are standard; cartridge disk drives hold 2.5-10M bytes each

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Prime 500	Sperry Univac BC/7	Sycor 340	Sycor 350	Sycor 410
DATA FORMATS					
Word length, bits	16 + 5	8-bit byte	8	8	8
Decimal digits per word	2	2	2	2	2
Bytes (characters) per word	2	1	1	1	1
Operand length, words	1-4	Variable	1	1	1-3
Instruction length, words	1,2,3	Variable	1-2	1-2	1-3
CPU					
Model	Prime 500	—	Sycor 340	Sycor 350	Sycor 410
Add time, microseconds	0.56	—	1.25 MSEC	1.25 MSEC	2.0 MSEC
No. of programmable registers	14	6	16	16	8
No. of I/O ports on basic system and maximum	64	4	16	16	256
INTERNAL STORAGE					
Type	MOS	MOS	MOS	MOS	MOS
Capacity of basic system, bytes	256K	32K	16K	16K	40K
Maximum capacity, bytes	8 million	64K	16K	16K	40K
Increment size, bytes	128K, 256K	16K	—	—	—
Cycle time, microseconds	0.760	1.0	1.250	1.250	0.500
Access time, microseconds	0.600	0.5	0.700	0.700	0.400
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Opt.; 2.4M bytes	Std.; 2M bytes	Std.; 500K bytes	Std.; 1M byte	Opt.; 242K bytes
Cartridge disk drive	Opt.; 48M bytes	Opt.; 40M bytes	No	No	Std.; 5M bytes
Pack disk drive	Opt.; 2400M bytes	No	No	No	No
Fixed-head disk/drum	Opt.; 8 million	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	No	Standard	Standard	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 200 cps	No	No	No	No
Paper tape punch	Opt.; 75 cps	No	No	No	No
Punched card reader	Opt.; 285 cpm	No	Opt.; 250 cpm	Opt.; 250 cpm	Opt.; 250 cpm
Punched card punch	No	No	No	No	No
Punched card reader/punch	Opt.; 300 cpm	No	No	No	No
Serial printer	Opt.; 165 cps	Opt.; 200 cps	No	Opt.; 60-180 cps	Opt.; 60-180 cps
Line printer	Opt.; 1220 lpm	Opt.; 250 lpm	Opt.; 300-600 lpm	Opt.; 300-600 lpm	Opt.; 300-600 lpm
Reel-to-reel tape drive	Opt.; 120 KBS	Opt.; 20/40 KBS	Opt.; 10/20 KBS	Opt.; 10/20 KBS	Opt.; 10/20 KBS
Cassette tape drive	No	No	Standard	No	Standard
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Opt.; 24 x 80 char.	Std.; 24 x 80 char.	Std./ 64 x 8 char.	Std.; 64 x 8 char.	Std.; 64 x 8 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	64	2	1	1	1
Synchronous	Opt.; 20K bps	Opt.; 2000-9600 bps	Opt.; to 4800 bps	Opt.; to 4800 bps	Std.; to 4800 bps
Asynchronous	Opt.; 192K bps	No	Opt.; to 1200 bps	Opt.; to 1200 bps	Opt.; to 1200 bps
Protocols supported	2780, HASP	See comments	IBM 2770/2780/3780, TTY	IBM 2770/2780/3780, TTY	IBM 2770/2780/3780, HASP
SOFTWARE SUPPORT					
COBOL	Yes	No	No	No	Yes
RPG	Yes	Yes	No	No	No
FORTRAN	Yes	No	No	No	No
BASIC	Yes	No	No	No	No
Assembler	Yes	No	No	No	No
Other programming languages	Forms	ESCORT	TAL II	TAL II	TAL II
Multiprogramming	Yes, 64	Yes; 2 partitions	No	No	Yes; 2
Language implemented in firmware	Partial	No	No	No	No
Operating system implemented in firmware	Partial	No	No	No	No
General accounting packages	No	Yes	No	No	No
Industry application areas	Graphics, statistics	Whlsl., distribution, manufacturing	—	—	Transportation
Data base management system	Yes	No	No	No	No
File access methods supported	Sequential, random, indexed sequential	Sequential, direct, indexed	Sequential, random, indexed sequential	Sequential, random, indexed sequential	Sequential, random, indexed sequential
Software separately priced	Yes	Yes	No	No	No
Technical help separately priced	Yes	Yes	No	No	No
PRICING & AVAILABILITY					
Purchase price of basic system, $	$130,000	$17,283	$12,000	$9,600	$21,500
Monthly rental of basic system, $	$2,847	$385 (5-yr. lease)	$234 (2-yr. lease)	$186 (2-yr. lease)	$386 (3-yr. lease)
Date of first U.S. delivery	2nd qtr. 1977	April 1977	Nov. 1969	July 1975	Jan. 1976
Number installed in U.S. to date	—	—	Over 12,000	Over 3,000	250
COMMENTS	Each user has 512 million bytes of virtual address space; includes fast floating-point hardware				

*"Std." means the device is included in the price of the "basic system" as listed here.

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MANUFACTURER & MODEL	Sycor 440	Tealtronic 2500	Wang PCS-II	Wang WCS 25	Wang WCS 40
DATA FORMATS					
Word length, bits	8	8-bit byte	8-bit byte	8-bit byte	8-bit byte
Decimal digits per word	2	1 per byte	—	—	—
Bytes (characters) per word	1	—	1 per byte	1 per byte	1 per byte
Operand length, words	1-3	—	1 byte	1 byte	1 byte
Instruction length, words	1-3	4 bytes	1 byte	1 byte	1 byte
CPU					
Model	Sycor 440	Tealtronic 2500	Wang 2200T	Wang 2200T	Wang 2200 MVP
Add time, microseconds	2.0 ms	—	800 (13 digits)	800 (13 digits)	800 (13 digits)
No. of programmable registers	8	26	None	None	None
No. of I/O ports on basic system and maximum	256	32	4	3,9	3,9
INTERNAL STORAGE					
Type	MOS	MOS	MOS	MOS	MOS
Capacity of basic system, bytes	24K	20, 480	8K	24K	32K
Maximum capacity, bytes	64K	65,536	32K	32K	64K
Increment size, bytes	8K	4K, 8K, 16K	8K	8K	16K
Cycle time, microseconds	0.500	0.600	1.60	1.60	0.600
Access time, microseconds	0.400	—	—	—	0.500
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Opt.; 242K bytes	Std.; 512K bytes	Std.; 178K bytes	Std.; 524K bytes	Std.; 262K bytes
Cartridge disk drive	Std.; 20M bytes	No	No	Opt.; 20M bytes	Std.; 10M bytes
Pack disk drive	No	No	No	No	No
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	Standard	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	No	No	Opt.; 300 cps	Opt.; 300 cps
Paper tape punch	No	No	No	No	No
Punched card reader	Std.; 250 cpm	No	No	Opt.; 300 cpm	Opt.; 300 cpm
Punched card punch	No	No	No	No	No
Punched card reader/punch	No	No	No	No	No
Serial printer	Opt.; 60-180 cps	Opt.; 45, 165 cps	Opt.; 200 cps	Std.; 120 cps	Opt.; 200 cps
Line printer	Opt.; 300-600 lpm	Opt.; 300 lpm	Opt.; 600 lpm	Opt.; 600 lpm	Std.; 240 lpm
Reel-to-reel tape drive	Opt.; 10/20 KBS	No	No	Opt.; 10 KBS	Opt.; 10 KBS
Cassette tape drive	Standard	No	No	Opt.; 326 cps	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Std.; 64 x 8 char.	Std.; 6 x 40 char.	Std.; 24 x 80 char.	Std.; 24 x 80 char.	Std.; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	1	1	1	1 per port	1 per port
Synchronous	Opt.; to 4800 bps	Opt.; to 4800 bps	Opt.; 4800 bps	Opt.; 4800 bps	Opt.; 4800 bps
Asynchronous	Opt.; to 1200 bps	No	Opt.; 9600 bps	Opt.; 9600 bps	Opt.; 9600 bps
Protocols supported	IBM 2770/2780/3780, HASP	IBM 2780	2780/3780, 3741	2780/3780, 3741	2780/3780, 3741
SOFTWARE SUPPORT					
COBOL	Yes	No	No	No	No
RPG	No	No	No	No	No
FORTRAN	No	No	No	No	No
BASIC	No	No	Yes	Yes	Yes
Assembler	No	No	No	No	No
Other programming languages	TAL II	ACL	None	None	None
Multiprogramming	Yes; 2	No	No	No	Yes; 3
Language implemented in firmware	No	Partially	Fully	Fully	Fully
Operating system implemented in firmware	No	Partially	Fully	Fully	Partially
General accounting packages	No	Yes	Yes	Yes	Yes
Industry application areas	Transportation	—	—	—	—
Data base management system	No	No	No	No	No
File access methods supported	Sequential, random, index seq.	Sequential	Sequential, random, index seq.	Sequential, random, index seq.	Sequential, random, index seq.
Software separately priced	No	Free	Yes	Yes	Yes
Technical help separately priced	No	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$14,865	$9,900	$6,200	$26,750	$48,950
Monthly rental of basic system, $	$276 (3-yr. lease)	NA	$152	$655	$1,199
Date of first U.S. delivery	Jan. 1976	2nd qtr. 1977	June 1977	June 1977	September 1977
Number installed in U.S. to date	250	—	—	—	—
COMMENTS		Manufactured in Holland; sold in U.S. by Tealtronic of America, Inc., 14 Commerce Dr., Cranford, NJ 07016 (201) 272-2922	Uses "mini-diskettes," 1 standard, 2nd optional	4 terminals maximum	8 terminals maximum

*"Std." means the device is included in the price of the "basic system" as listed here.

MAY 1977