*luv 9/74*

All About Small Business Computers

Clearly, the time of the small business computer has arrived. 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'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 46 pages of detailed comparison charts that present the salient characteristics of 228 current small business computer systems from 96 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.
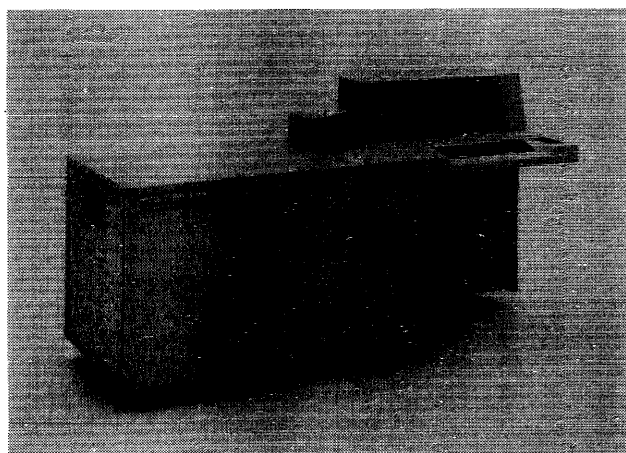
IBM's System/32 is the new pacesetter in the small business computer marketplace, with more than 15,000 systems installed or on order. All components are packaged into one desk-sized unit. A minimum system includes 16K bytes of memory, 3.2 megabytes of nonremovable disk storage, a diskette (floppy) drive, an operator's keyboard and display, and a 40-cps unidirectional serial printer. This minimum system can be rented for $680 a month or be purchased for $33,560. IBM recently announced optional facilities that equip the System/32 to handle word processing as well as data processing.

This comprehensive report is designed to help you select and apply low-cost business data processing systems. The characteristics and prices of 228 current systems from 96 vendors are reported in detailed comparison charts, and the report also explains the current technology and provides straightforward buying guidance.

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 $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 operation 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 ▷

All About Small Business Computers

The NCR 499 is an enhanced-performance functional replacement for the company's four-year-old 399 business/accounting minicomputer. Integral with the processor is a magnetic ledger card feeder/reader with 75-cps bidirectional printer, keyboard console and display, and from one to four magnetic tape cassette drives. Other peripheral devices available include punched paper tape equipment, punched card units, 55- to 300-lpm line printers, and up to 9.8 megabytes of on-line disk storage.
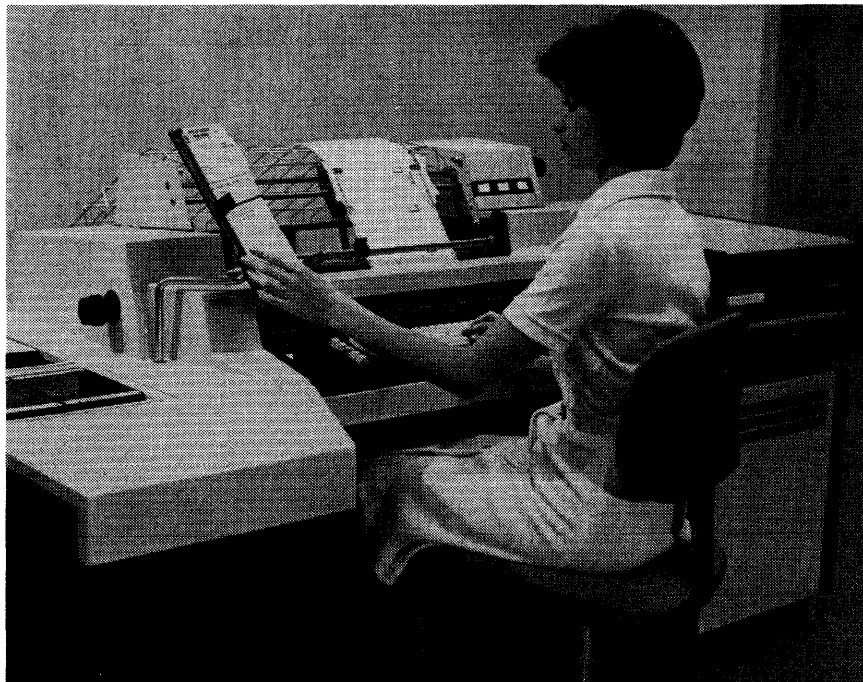
▷ basic systems from the small business computer vendors comprise the four elements listed above.

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 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 ▷

All About Small Business Computers

> 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, and NCR, 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, Interdata, Microdata, 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 the turnkey systems is that all software is written by the vendor; therefore, the user is not required to employ a high-priced programming staff.

Semiconductor and 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, System Integration Associates, Wintex Computer Corporation, and others are now offering small business sysems that sell for $5,000 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 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.

From the first group of vendors come the leading U.S. suppliers of small business computers, which have long been Burroughs Corporation and NCR Corporation. It is no coincidence that Burroughs and NCR are also the leading suppliers of conventional adding and accounting machines and of the paper supplies for such machines. Both companies have huge marketing and service organizations and have done an effective job of trading their customers up to progressively more powerful equipment as their data processing requirements expand in volume and complexity. Burroughs, the clear-cut leader in recent years, offers the industry's broadest line of business minicomputers, including the recently announced B80. NCR, whose development efforts lagged behind those of its arch-rival for several years, has largely closed the gap with the attractive NCR 299, 399, and 499 electronic accounting systems and the Century 8200, a more typical SBC.

IBM, the dominant supplier of both larger computer systems and punched-card tabulating equipment, is now making strong moves to advance its ranging in the SBC marketplace. The company has only recently begun to achieve proportionate success in the business computer market—but the odds are that IBM will soon be by far the largest producer of this class of equipment as well. The dramatic increase in IBM's penetration of this segment of the marketplace hinges largely upon the advent of two highly significant business minicomputers: the System/3 and System/32.

The IBM System/3, introduced in 1969, is a strong entry at the upper end of the small business computer market segment. It is now offered in six distinct versions—the multi-user Model 4, the keyboard-oriented Model 6, the diskette-based Model 8, the batch-oriented Model 10, the Model 12 (a MOSFET version of the Model 10), and the more powerful Model 15—at system purchase prices ranging from about $40,000 to more than $300,000. IBM has already completed more than 30,000 installations of the System/3, making it one of the fastest-selling computers in history.

The 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 ▷

All About Small Business Computers

substantially enlarged the total market for small business computers and appears to be generating increased sales for both IBM and many of its competitors. IBM currently has about 5500 System/32's installed and another 10,000 or more on order.

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, respectively. 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 $12,500. 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 hopes to achieve high-volume sales of the Datasystem 310 by selling it in two ways: directly to end users who are prepared to write their own applications programs, and through a distributorship network of software houses that will do the applications programming for less sophisticated users.

Hewlett-Packard, General Automation, Interdata, Computer Automation, and Harris are five more major suppliers of scientific minicomputers that now offer "packaged" hardware/software configurations oriented toward business data processing applications. Numerous other companies (such as Display Data, Dimis Inc., and Martin, Wolfe) produce business computer systems based upon minicomputers manufactured by other firms (such as Microdata, Modcomp, and Digital Computer Controls, respectively).

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 data communications 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 ▷

All About Small Business Computers
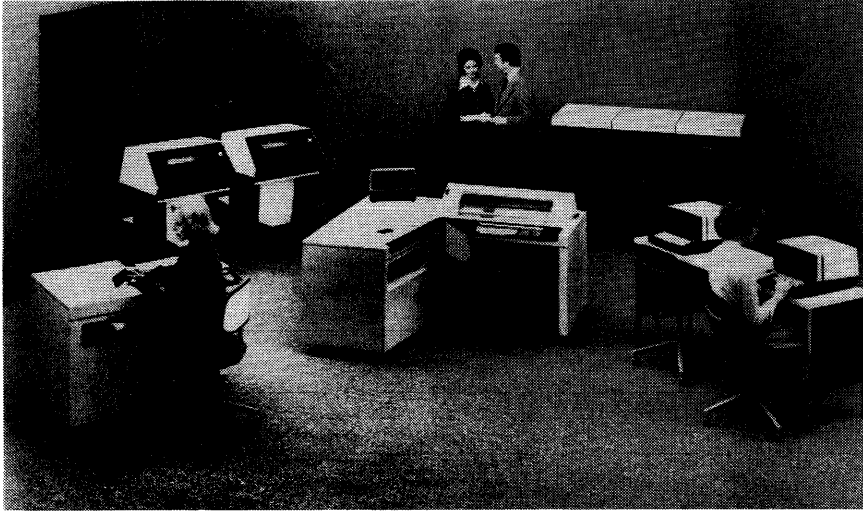
Small business computers need not be small in size or peripheral capabilities, as illustrated by this large Burroughs B 80 configuration. The B 80 can start with a compact system much like the module in the center of the photo—a desk-sized unit containing the main memory, serial printer, keyboard, cassette and/or floppy disk drives, and an operator's display panel—and grow into the large system shown here. This configuration includes three dual-drive disk cartridge subsystems (right background), two line printers (left background), and two CRT's (right foreground). An Audit Entry Data Preparation System (left foreground) can be used for local or remote preparation and verification of data on tape cassettes.

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 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:

All About Small Business Computers

▷ ● 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.

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.

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 ▷

All About Small Business Computers

▷ 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 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, tabulating equipment, accounting machines, 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 228 small business computers from 96 vendors are presented in the accompanying comparison charts. All of these systems are currently being marketed in the United States. The information in the charts waas supplied and/or verified by the manufacturers or U.S. suppliers during July and August 1976; 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 character 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 ▷

All About Small Business Computers

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 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 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 ▷

A typical turnkey system is the Prophet 21 developed by Programmed Control Corporation. The hardware consists of (from left to right): a 1920-character Infoton CRT, two Diablo Model 30 2.2-megabyte disk drives, a Data 100 250-lpm printer, and a 32K-byte Texas Instruments 960B minicomputer. To this hardware configuration, Programmed Control Corporation adds special software packages dedicated to wholesale hardware distributors, drug store suppliers, and beverage manufacturers and suppliers. This turnkey system carries a purchase price of $55,000.

All About Small Business Computers

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. As in large computers, magnetic cores are still the most commonly used internal storage medium. 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. Look for the use of MOS memory to approach equality with that of core memory, probably as early as next year. 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. Therefore, the storage cycle time is of considerably less importance—as long as the machine is fast enough so that the operator seldom has to wait for it to finish processing one transaction before she can key in the data for the next transaction.

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, usually 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 will make disk units impractical for many small computer buyers, despite the obvious appeal of disk-oriented data processing.

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 ▷

All About Small Business Computers

▷ 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.

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 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 prevously recorded transaction data. It's worth noting that many of the paper tape readers and punches employed in these sysems 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. ▷

All About Small Business Computers

The WCS-20 from Wang Laboratories is shown in a typical small-system configuration. Components include the 2221W 200-cps (65-300 lpm) printer, a 2200T CPU with 8K bytes of memory (housed in desk pedestal), a 2226 12-inch CRT/keyboard, and two 2242 floppy disk drives. Purchase price for this system is approximately $21,100. A 5-megabyte fixed/removable disk drive can be added for an additional $12,500.

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, a CRT/keyboard is 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.

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 programmer 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 ▷

All About Small Business Computers

▷ 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.

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 system functions at the hardware level. Microcode routines can be substituted for often-used subroutines, 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 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 ▷

All About Small Business Computers

▷ 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 propsective 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, 1976. All 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 96 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.

American Management Systems, Inc., 561 Pilgrim Drive, Suite D, San Mateo, California 94404. Telephone (415) 573-9481.

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, 344 New Albany Road, Moorestown, New Jersey 08057. Telephone (609) 234-3666.

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.

Ball Computer Products, Inc., 860 E. Arquez Avenue, Sunnyvale, California 94086. Telephone (408) 733-6700.

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.

BDS Computer Corporation, 260 Sheridan Avenue, Palo Alto, California 94306. Telephone (415) 326-1500.

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, 324 Passaic Avenue, Nutley, New Jersey 07110. Telephone (201) 661-4950.

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.

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

Cincinnati Milacron Inc., Mason Marrow Road, Lebanon, Ohio 45036. Telephone (513) 494-1200.

Codon Corporation, 11 DeAngelo Drive, Bedford, Massachusetts 01730. Telephone (617) 275-2000.

Compagnie Internationale pour l'Informatique (CII), 68 Route de Versailles, 78 Louveciennes, France. Telephone 951-86-00. ▷

All About Small Business Computers

▷ *Complete Computer Systems,* 1 Fairway Plaza, Suite 320B, Huntingdon Valley, Pennsylvania 19006. Telephone (215) 947-7900.

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

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.

Computer Technology, Limited, Eaton Road, Hemel Hempstead, Hertfordshire HP2 7EQ, England. Telephone Hemel Hempstead (0442) 3272.

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

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

Datasaab Systems Inc., 437 Madison Avenue, New York, New York 10022. Telephone (212) 754-0680.

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, 10 West College Terrace, Frederick, Maryland 21701. Telephone (301) 663-3289.

Dimis, Inc., 1060 Highway 3 South, Middletown, New Jersey 07748. Telephone (201) 671-1011.

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

Educomp 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, P.O. Box 17388, Irvine, California 92713. Telephone (714) 838-6209.

General Robotics Corporation, 57 N. Main Street, Hartford, Wisconsin 53027. Telephone (414) 673-6800.

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.

Hotel Computers, Inc., 2115 Arlington Downs Road, Arlington, Texas 76011. Telephone (817) 460-7575.

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

Information Associates, Inc., 97 Humboldt Street, Rochester, New York 19609. Telephone (717) 288-6900.

Interdata, Inc., 2 Crescent Place, Oceanport, New Jersey 07757. Telephone (201) 229-4040. ▷

All About Small Business Computers
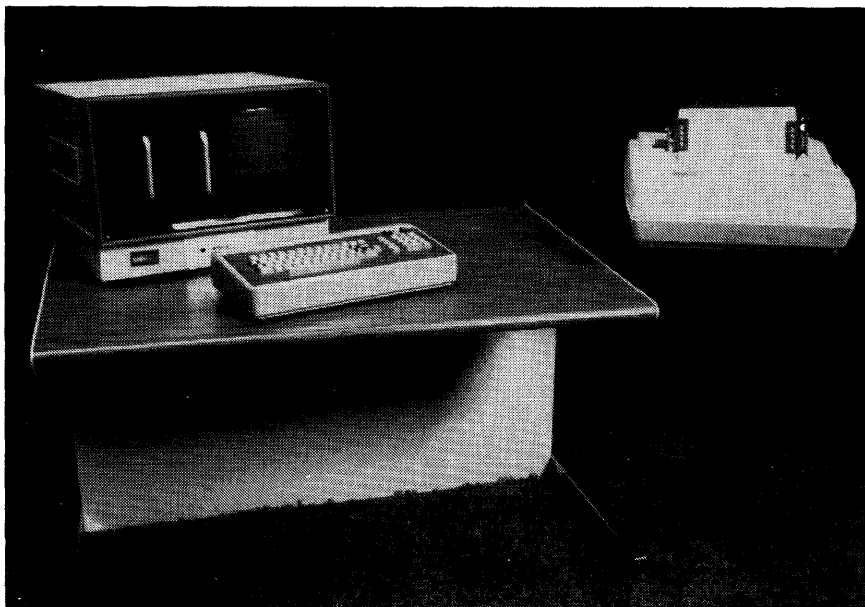
Typical of the new breed of small business computers, the Wintex 200NS is a microprocessor-based system that includes 8K bytes of memory, a 1080-character CRT/ keyboard, two floppy disk drives, and a 66-lpm printer in its basic configuration. Two additional floppies can be added, and memory can be expanded to 64K bytes. Wintex Computer Corporation sells the 200NS for $11,880, or the system can be leased for $280 a month on a 5-year lease.

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

International Computing Company, 7316 Wisconsin Avenue, Bethesda, Maryland 20014. Telephone (301) 654-9120.

IST Datasystems, 3000 Directors Row, Memphis Tennessee 38131. Telephone (901) 332-3544.

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.

Lockheed Electronics Company, Data Products Division, U.S. Highway 22, Plainfield, New Jersey 07060. Telephone (201) 757-1600.

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

Lucero Systems Corporation, 2255 Lyell Avenue, Rochester, New York 14606. Telephone (716) 254-8560.

Martin, Wolfe Inc., 8369 Vickers Street, San Diego, California 92111. Telephone (714) 277-3700.

Med Scientific International Corporation, P.O. Box 5127, Clearwater, Florida 33516. Telephone (813) 531-7754.

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.

Midas Systems Corporation, 222 Fashion Lane, Suite 115, Tustin, California 92680. Telephone (914) 592-8812.

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.

M.I.S. International, Inc., 31350 Smith Road, Romulus, Michigan 48174. Telephone (313) 326-7010.

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, Illinois 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.

▷

All About Small Business Computers

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

Qantel Corporation, 3225 Breakwater Avenue, Hayward, California 94545. Telephone (415) 783-5410.

Q1 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.

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

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

Tri Star Computer Systems, 304 Harper Drive, Mt. Laurel, New Jersey 08051. Telephone (609) 234-6661.

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.□

All About Small Business Computers

MANUFACTURER & MODEL	Advanced Information Design System 3000	Advanced Information Design System 4000	A.K. Industries, Inc. AKI-90	A.K. Industries, Inc. AKI-91	American Management Systems AMS OE/IC
DATA FORMATS					
Word length, bits	16	32	8-bit byte	8-bite byte	16
Decimal digits per word	4	7	2 per byte	2 per byte	4
Bytes (characters) per word	2	4	1 per byte	1 per byte	2
Operand length, words	½ to 1	½ to 1½	1, 2 bytes	1, 2 bytes	1
Instruction length, words	1, 2	1	1-3 bytes	1-3 bytes	1
CPU					
Model	Inter. 6/16, 8/16	Inter. 7/32, 8/32	Datapoint	8080A	DG Nova 3
Add time, microseconds	1.5	0.6	—	—	0.7-0.95
No. of programmable registers	16	32	14	7	20
No. of I/O ports on basic system and maximum	64; 256	128; 1024	16	256	2
INTERNAL STORAGE					
Type	Core	Core	MOS	MOS	MOS, core
Capacity of basic system, bytes	64K	128K	16K	32K	32K
Maximum capacity bytes	1024K	1024K	16K	64K	256K (w.mem.map)
Increment size, bytes	16K	32K	—	4K	2, 4, 8, 16K
Cycle time, microseconds	0.750	0.750; 0.300	1.6	0.5	0.7, 0.8, 1.0
Access time, microseconds	0.300	0.300	0.5	0.45	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Std.; 1.2M bytes	Std.; 1.2M bytes	Standard (4)	No	Opt.; 315K bytes
Cartridge disk drive	Opt.; 40M bytes	Opt.; 40M bytes	No	No	Std.; 10M bytes
Pack disk drive	Opt.; 320M bytes	Opt.; 320M bytes	No	Std.; 80M bytes	Opt.; 89.5M bytes
Fixed-head disk/drum	No	No	No	No	Opt.; 4M bytes
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Optional	Optional	Standard	Standard	Optional
Full accounting keyboard	Optional	Optional	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 300 cps	Opt.; 300 cps	No	No	Opt.; 400 cps
Paper tape punch	Opt.; 60 cps	Opt.; 60 cps	No	No	Opt.; 63 cps
Punched card reader	Opt.; 300-1000 cpm	Opt.; 300-1000 cpm	No	No	Opt.; 150-1000 cpm
Punched card punch	Opt.; 100 cpm	Opt.; 100 cpm	No	No	No
Punched card reader/punch	Optional	Optional	No	No	No
Serial printer	Std.; 165 cps	Std.; 165 cps	Std.; 165 cps	Std.; 165 cps	Opt.; 165 cps
Line printer	Opt.;120-1200 lpm	Opt.;120-1200 lpm	Opt.;125-600 lpm	Opt.; 125-600 lpm	Opt.; 240-300 lpm
Reel-to-reel tape drive	Std.; 75-120 KBS	Std.; 75-120 KBS	No	No	Opt.; 10-72 KBS
Cassette tape drive	Optional	Optional	No	No	Opt.; 1.6 KBS
Cartridge tape drive	Optional	Optional	No	No	No
Magnetic ledger card device	Optional	Optional	No	No	No
CRT	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 12 x 80 char.	Standard; 24 x 80 char.	Optional; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	30	50	1	8	32
Synchronous	Std.; to 30K bps	Std.; to 30K bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Std.; to 4800 bps
Asynchronous	Std.; to 19.2K bps	Std.; to 19.2K bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Std.; to 4800 bps
Protocols supported	IBM 2780/3780, SDLC	IBM 2780/3780, SDLC	IBM 2780	IBM 2780	None
SOFTWARE SUPPORT					
COBOL	Yes	Yes	No	No	No
RPG	No	No	No	No	No
FORTRAN	Yes	Yes	No	No	Yes
BASIC	Yes	Yes	Yes	Yes	Yes
Assembler	Macro assembler	Macro assembler	Yes	Yes	Yes
Other programming languages	PL/I, APL	PL/I, APL	Databus, Dataform	None	None
Multiprogramming	Yes; 4 partitions	Yes; 10 partitions	No	Yes; 2 partitions	Yes
Language implemented in firmware	No	No	No	Partially	Partially
Operating system implemented in firmware	No	No	No	Partially	Partially
General accounting packages	Yes	Yes	Yes	Yes	No
Industry application areas	Insur., inven., dist., ord. entry	Insur., inven., dist., ord. entry	Inventory	Inventory	Manufacturing, distribution
Data base management system	Yes	Yes	No	No	No
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	No	No	Yes
Technical help separately priced	No	No	No	No	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$28,000	$58,000	$25,000	$30,000	$14,000
Monthly rental of basic system, $	$616	$1,200	$550	$660	$500
Date of first U.S. delivery	March 1975	October 1976	November 1974	August 1976	January 1976
Number installed in U.S. to date	20	NA	10	1	4
COMMENTS	System price includes 2 CRT's & 10 MB of disk storage	System price includes 4 CRT's & 100 MB of disk storage	Turnkey system; does not require data processing professional for operation	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.

All About Small Business Computers

MANUFACTURER & MODEL	Anderson-Jacobson 1400	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	1 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	1-3 bytes
CPU					
Model	—	—	Intel 8080	DG Nova	Datapoint 1100
Add time, microseconds	4 (1 word)	4 (1 word)	2 (1 byte)	1.35 (1 word)	16 (5 digits)
No. of programmable registers	128	128	6	4	16
No. of I/O ports on basic system and maximum	3; 8	3; 8	1; 256	8; 16	7; 7
INTERNAL STORAGE					
Type	Core	Core	MOS	Core	MOS
Capacity of basic system, bytes	16K	16K	16K	64K	32K
Maximum capacity, bytes	32K	65K	65K	212K	32K
Increment size, bytes	16K	16K	16K	32K	None
Cycle time, microseconds	1.2	1.2	2	1.0	1.6
Access time, microseconds	0.6	0.6	—	0.5	0.5
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	Standard	Std.; 256K bytes	No	Std.; 256K bytes
Cartridge disk drive	No	Optional	Opt.; 10M bytes	No	No
Pack disk drive	No	No	No	Std.; 320M bytes	No
Fixed-head disk/drum	No	No	Opt.; 2.5M bytes	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Opt.; 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	Std.; 300 cps	Std.; 300 cps	Opt.; 300 cps	Optional	No
Paper tape punch	No	No	Opt.; 75 cps	Optional	No
Punched card reader	Opt.; 300 cpm	Opt.; 300 cpm	No	Optional	No
Punched card punch	No	No	No	Optional	No
Punched card reader/punch	No	No	No	Optional	No
Serial printer	Std.; 45 cps	Std.; 45 cps	Opt.; to 55 cps	Std.; 165, 330 cps	Std.; 80, 165 cps
Line printer	Opt.; to 600 lpm	Opt.; to 600 lpm	Opt.; to 1400 lpm	Opt.; 300,600 lpm	Opt.; 300 lpm
Reel-to-reel tape drive	Opt.; 20 KBS	No	Opt.; to 75 ips	Optional	No
Cassette tape drive	No	No	No	No	Optional
Cartridge tape drive	No	No	Optional	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Optional; 24 x 80 char.	Optional; 24 x 80 char.	Optional	Standard; 27 x 74 char.	Standard; 12 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	8	8	2	7	1
Synchronous	No	No	Opt.; to 9600 bps	No	Opt.; 9600 bps
Asynchronous	Opt.; 1200 bps	Opt.; 1200 bps	Opt.; to 9600 bps	Std.; 1200 bps	Opt.; 9600 bps
Protocols supported	None	None	Bisync	IBM 2780	Bisync, IBM 2780/3780
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	Yes	Yes
Other programming languages	ESP	ESP	None	Extended BASIC	Databus II
Multiprogramming	No	No	No	Yes	No
Language implement in firmware	Partially	Partially	No	No	No
Operating system implemented in firmware	Partially	Partially	Partially	No	Partially
General accounting packages	Yes	Yes	No	Yes	Yes
Industry application areas	CPA's, public accountants	CPS's, public accountants	—	—	Mfg.inventory, food processing
Data base management system	No	No	No	Yes	No
File access methods supported	—	Sequential, direct access	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index seq.
Software separately priced	Yes	Yes	Yes	Yes	No
Technical help separately priced	Yes	Yes	Yes	Yes	No
PRICING & AVAILABILITY					
Purchase price of basic system, $	$16,500	$19,500	$4,500	$39,300	$29,990
Monthly rental of basic system, $	$380	$450	—	$865	$690
Date of first U.S. delivery	1970	NA	May 1975	June 1976	August 1976
Number installed in U.S. to date	250+	NA	100	NA	NA
COMMENTS	Three-cassette system	Two-diskette system; also available with four diskettes; up to 10M bytes	Minimal system must include either a CRT or TTY; up to 16 CRT's supported	Resource/100 Extended Opt. Sys. are said to meet 95% of most users' needs for bus. applications	

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

OCTOBER 1976

All About Small Business Computers

MANUFACTURER & MODEL	Applied Digital Communications 201	Applied Digital Communications 301	Applied Digital Technology	Applied Systems Corp. ASC 1800	J. Baker & Associates Distribution Sys.
DATA FORMATS					
Word length, bits	8-bit byte	16	16	8-bit byte	16
Decimal digits per word	2 per byte	4	2	2 per byte	2
Bytes (characters) per word	1 per byte	2	2	1 per byte	2
Operand length, words	1 byte	1	½, 1	1 byte	1
Instruction length, words	1, 2 bytes	1, 2	1, 2	1-3 bytes	1-3
CPU			GA SPC		DEC Datasystem
Model	Lockheed II or III	Varian V76	16/45, 16/65	Intel 8080	354
Add time, microseconds	8.4 (6 digits)	10 (6 digits)	0.96; 1.4 (word)	2 (1 byte)	7.0 (1 word)
No. of programmable registers	12	16	8	16	6
No. of I/O ports on basic system and maximum	3; 8	3; 64	2	2; 256	2; 12
INTERNAL STORAGE					
Type	MOS	MOS	Core	MOS	Core
Capacity of basic system, bytes	48K	64K	4K	4K	32K
Maximum capacity, bytes	128K	256K	64K	64K	64K
Increment size, bytes	16K, 32K	16K, 32K, 64K	4K, 8K	4K	32K
Cycle time, microseconds	0.8	0.66	0.96; 1.4	0.5	0.98
Access time, microseconds	0.4	—	—	—	0.49
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	Opt.; 256K bytes	Opt.; 147K bytes	Opt.; 500K bytes	Opt.; 512K bytes
Cartridge disk drive	Std.; 5M bytes	Std.; 5M bytes	Std.; 10M bytes	Opt.; 250K bytes	Std.; 19.2M bytes
Pack disk drive	Opt.; 50M bytes	Opt.; 200M bytes	Opt.; 100M bytes	RPQ	No
Fixed-head disk/drum	No	Optional	Opt.; 256K bytes	RPQ	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	Standard	Optional	Standard
Full accounting keyboard	No	No	No	Optional	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	Opt.; 300 cps	Opt.; 300, 400 cps	Opt.; 20-300 cps	No
Paper tape punch	No	Optional	Opt.; 75 cps	Opt.; 10-50 cps	No
Punched card reader	Opt.; 285 cpm	Optional	Opt.;300-1000 cpm	Opt.; 200 cpm	Opt.; 300 cpm
Punched card punch	No	Optional	Opt.; 35 cpm	Opt.; 100 cpm	No
Punched card reader/punch	Opt.; 300/120 cpm	Optional	No	Opt.; RPQ	No
Serial printer	Std.; 88 cps	Std.; 165 cps	Std.; 165 cps	Std.; 30 cps	Opt.; 30 cps
Line printer	Opt.; 300, 600 lpm	Opt.; 300, 600 lpm	Opt.; 200-600 lpm	Opt.; 100-600 lpm	Opt.; 230,300 lpm
Reel-to-reel tape drive	Opt.; 36 KBS	Opt.; 36, 72 KBS	Std.; 7.5-60 KBS	Opt.; RPQ	Opt.; 10-72 KBS
Cassette tape drive	No	No	No	Opt.; RPQ	No
Cartridge tape drive	No	No	No	Opt.; RPQ	No
Magnetic ledger card device	No	No	No	Opt.; RPQ	No
CRT	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 8 x 64, 27 x 74 char.	Optional; 20 x 40 char.	Optional; 12 x 80, 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	8	64	4	16	4-8
Synchronous	No	Opt.; to 9600 bps	Std.; to 9600 bps	Opt.; to 9600 bps	Optional
Asynchronous	Std.; to 9600 bps	Std.; to 9600 bps	Std.; to 9600 bps	Opt.; to 9600 bps	Optional
Protocols supported	None	IBM 2780/3780, bisync	None	Bisync, other error correct. protocols	2780 bisync
SOFTWARE SUPPORT					
COBOL	No	Yes	Yes	No	No
RPG	Yes (RPG II)	Yes (RPG II)	Yes	No	No
FORTRAN	Yes (FORT. IV)	Yes (FORT. IV)	Yes	No	No
BASIC	No	Yes	No	Yes	No
Assembler	Yes	Yes	Yes	Yes	No
Other programming languages	None	None	None	PL/M	DIBOL (COBOL)
Multiprogramming	Yes; 9 partitions	Yes	Yes	—	Yes; 4 partitions
Language implemented in firmware	No	No	No	Partially	No
Operating system implemented in firmware	No	No	No	Fully	No
General accounting packages	Yes	Yes	Yes	Yes; custom	Yes
Industry application areas	Mfg. inventory; food processing	Mfg. inventory;food proc.; indust. cont.	Property management, accounting	Communications	Manufacturing, distribution
Data base management system	No	Yes (TOTAL)	No	No	Yes
File access methods supported	Random, sequential, index seq.	Random, sequential, index seq.	Direct, sequential, index seq.	Sequential, random	Direct, sequential
Software separately priced	No	No	Yes	Yes	Yes
Technical help separately priced	No	No	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$39,990	$49,990	$50,000-$100,000	$5,000	$55,000
Monthly rental of basic system, $	$920	$1,150	Purchase only	$250	Purchase only
Date of first U.S. delivery	NA	January 1975	January 1972	1974	September 1975
Number installed in U.S. to date	NA	4	10	NA	10
COMMENTS			Marketed in Chicago area only	Oriented toward local and satellite processing with communications support or custom applications	Software costs $7K-9.5K for plumbing, soft drinks, auto parts, or hardware distribution; full manufacturing system also available

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

All About Small Business Computers

MANUFACTURER & MODEL	J. Baker & Associates Distribution Sys. 2	Ball Computer Products DASL	Basic Four Corporation Model 350	Basic Four Corporation Model 400	Basic Four Corporation Model 600
DATA FORMATS					
Word length, bits	16	16	8-bit byte	8-bit byte	8-bit byte
Decimal digits per word	2	2	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	1	Variable	Variable	Variable
Instruction length, words	1-3	1,2	2 bytes	2 bytes	2 bytes
CPU					
Model	DEC Datasys. 356	DG Nova 2/10	Microdata	Microdata	Microdata
Add time, microseconds	5.0 (1 word)	1.0 (1 word)	7.0	7.0	7.0
No. of programmable registers	8	3	3	3	3
No. of I/O ports on basic system and maximum	3, 16	11, 22	1, 8	1, 8	1, 8
INTERNAL STORAGE					
Type	Core	Core	Core	Core	Core
Capacity of basic system, bytes	32K	65K	24K	24K	32K
Maximum capacity, bytes	64K	65K	65K	65K	65K
Increment size, bytes	32K	None	8K	8K	8K
Cycle time, microseconds	0.98	1.0	1.0	1.0	1.0
Access time, microseconds	0.49	0.5	0.5	0.5	0.5
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Std.; 512K bytes	No	No	No	No
Cartridge disk drive	Std.; 19.2M bytes	Std.; 46.4M bytes	Std.; 20M bytes	Std.; 20M bytes	Std.; 20M bytes
Pack disk drive	Opt.; 160M bytes	Opt.; 640M bytes	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	Opt.; 300 cps	Opt.; 300 cps	Opt.; 300 cps
Paper tape punch	No	No	Opt.; 75 cps	Opt.; 75 cps	Opt.; 75 cps
Punched card reader	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm
Punched card punch	No	No	Opt.;400,800 cpm	Opt.;400,800 cpm	Opt.;400,800 cpm
Punched card reader/punch	No	No	No	No	No
Serial printer	Opt.; 30 cps	Opt.; 120 cps	Std.; 165 cps	Std.; 165 cps	Std.; 165 cps
Line printer	Opt.; 230, 300 lpm	Opt.;200-400 lpm	Opt.;300, 600 lpm	Opt.;300,600 lpm	Opt.;300,600 lpm
Reel-to-reel tape drive	Opt.; 10-72 KBS	Opt.; to 120 KBS	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	Optional; 12 x 80, 24 x 80 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	8-16	16	8	8	8
Synchronous	Optional	No	No	No	Opt.; 2000 bps
Asynchronous	Optional	Std.; to 9600 bps	Standard	Standard	Standard
Protocols supported	IBM 2780 bisync	None	None	None	IBM 2780
SOFTWARE SUPPORT					
COBOL	No	No	No	No	No
RPG	No	No	No	No	No
FORTRAN	No	Yes	No	No	No
BASIC	No	Yes	Yes	Yes	Yes
Assembler	No	Yes	No	No	No
Other programming languages	DIBOL (COBOL)	DASL	None	None	No
Multiprogramming	Yes; 4 partitions	Yes; 16 partitions	Yes; 8 partitions	Yes; 8 partitions	Yes; 8 partitions
Language implemented in firmware	No	No	No	No	No
Operating system implemented in firmware	No	No	Partially	Partially	Partially
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Distribution, mfg.	Manufacturing	Agric.,const., trans.,dist.,mfg.,fi.	Agric., const., trans.,dist.,mfg.,fi.	Agric., const., trans.,dist.,mfg.,fi.
Data base management system	Yes	Yes	No	No	No
File access methods supported	Direct, sequential	Sequential, index	Sequential, random	Sequential, random	Sequential, random
Software seprately priced	Yes	Yes	Yes	Yes	Yes
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$70,000	$37,900	$34,400	$36,900	$51,000
Monthly rental of basic system, $	—	Various	$791 (lease/purch.)	$849(lease/purch.)	$1,180(lease/pur.)
Date of first U.S. delivery	Sept. 1975	June 1975	1971	1971	1975
Number installed in U.S. to date	See Dist. Sys. 1	3	3000 (all models)	3000 (all models)	3000 (all models)
COMMENTS	See Distribution System 1 comments; developed with major brewery	5.8 or 11.6 M-byte cartridge disks (3) optional; 40 or 80 M-byte pack disks (8) optional; price includes inventory control sytem	Service available in 160 U.S. cities, system designed for small to medium businesses	Service available in 160 U.S. cities, system designed for small to medium businesses	Service available in 160 U.S. cities, system designed for small to medium businesses

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

All About Small Business Computers

MANUFACTURER & MODEL	Basic Timesharing 4000/15	Basic Timesharing 4000/25	BDS Computer Corp. BDS-3	Binary Data Systems UCOM	Burroughs L 9000 Series
DATA FORMATS					
Word length, bits	16	16	16	16	64
Decimal digits per word	2	2	2	2, 4	16
Bytes (characters) per word	2	2	2	2	8
Operand length, words	1	1	1	1, 2	1
Instruction length, words	1	1	1, 2	1	Variable
CPU					
Model	BTI 4020	BTI 4020	DEC PDP-11/03	DG Nova 3	—
Add time, microseconds	20	20	4	10 (1 word)	1.8
No. of programmable registers	2	2	8	5	4 + accum.in mem.
No. of I/O ports on basic system and maximum	11	11	3, 6	3, 10	8
INTERNAL STORAGE					
Type	MOS	MOS	MOS	Core	MOS
Capacity of basic system, bytes	64K	64K	40K	64K	4K
Maximum capacity, bytes	64K	64K	64K	256K	48K
Increment size, bytes	None	None	8, 16K	32K, 64K	2K
Cycle time, microseconds	0.65	0.65	0.69	0.800	1.5
Access time, microseconds	0.3	0.3	—	0.400	1.2
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	No	Opt.	No
Cartridge disk drive	Std.; 30M bytes	Opt.; 30M bytes	Std.; 20M bytes	Std.; 40M bytes	No
Pack disk drive	Opt.; 389M bytes	Std.; 389M bytes	No	Opt.; 368M bytes	No
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	No	No	Standard	Standard	Standard
10-key numeric keyboard	No	No	Standard	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	No	No	Opt.	Opt.; 40 cps
Paper tape punch	No	No	No	No	Opt.; 40 cps
Punched card reader	No	No	No	Opt.	Opt.; 480 cpm
Punched card punch	No	No	No	No	Opt.; 96 cpm
Punched card reader/punch	No	No	No	No	Opt.; 300/60 cpm
Serial printer	No	No	No	Std.; 165 cps	Std.; 60, 90 cps
Line printer	Opt.; 300-900 lpm	Opt.; 300-900 lpm	Std.; 180-900 lpm	Opt.; 300-1500	Opt.; 90-250 lpm
Reel-to-reel tape drive	Opt.; to 72 KBS	Opt.; to 72 KBS	Opt.; 10-36 KBS	Opt.; 10-36 KBS	Opt.; 10 KBS
Cassette tape drive	No	No	No	No	Std.; 1 KBS
Cartridge tape drive	Std.; 40 KBS	Std.; 40 KBS	No	No	No
Magnetic ledger card device	No	No	No	No	Std. on 9500 & 9900
CRT	No	No	Standard; 24 x 80 char.	Standard; 25 x 80 char.	Optional; 8 x 32 char.
COMMUNICATIONS CAPABILITIES					
Maximum no. of lines	4	4	8	256	2
Synchronous	No	No	No	Optional	Opt.; to 9600 bps
Asynchronous	Opt.; 2500 bps	Opt.; 2500 bps	Std.; to 9600 bps	Optional	Opt.; to 9600 bps
Protocols supported	User-program-mable	User-program-mable	None	IBM 2780 and others	2780 bisync, SDLC, BDLC
SOFTWARE SUPPORT					
COBOL	No	No	No	Yes	Yes
RPG	No	No	No	Yes	No
FORTRAN	No	No	No	Yes	No
BASIC	Yes	Yes	Yes	Yes	No
Assembler	No	No	No	Yes	Yes
Other programming languages	No	No	No	No	No
Multiprogramming	No	No	Yes; 8 partitions	Yes; 64 partitions	No
Language implemented in firmware	Partially	Partially	No	No	Fully
Operating system implemented in firmware	Partially	Partially	No	No	—
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	School adminis-tration	School adminis-tration	General business accounting	Whlsl./dist., real estate, medical	All bus. acctg. ap-plications
Data base management system	Yes	Yes	No	Yes	No
File access methods supported	Random, sequen-tial, index seq.	Random, sequen-tial, index seq.	Random, sequen-tial, index seq.	Random, sequen-tial, index seq.	—
Software separately priced	Yes	Yes	Yes	No	Yes
Technical help separately priced	No	No	Yes	No	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$35,950	$56,300	$8,495	$75,000	$16,490
Monthly rental of basic system, $	No	—	Purchase only	$1,500	$561
Date of first U.S. delivery	January 1976	January 1976	NA	July 1973	2nd quarter 1976
Number installed in U.S. to date	NA	NA	NA	NA	Thousands
COMMENTS	Up to 32 user ter-minals concurrent-ly, or 24 + 4 lines; 7.5 M-byte cart. drive std.	Up to 32 user ter-minals concurrent-ly, or 24 + 4 comm. lines; 49 M-byte pack drive std.		Dual-processor systems available	Six models: L9300, L 9400, and L 9500 with 60-cps printer, L 9700, L 9800, and L 9900 with 90-cps printer; L 9500 and L 9900 have mag. ledger capability

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

All About Small Business Computers

MANUFACTURER & MODEL	Burroughs B 80	Burroughs B 730/B 720	Burroughs B 1700 Series	Burroughs B 1720 Series	Business Controls System 80
DATA FORMATS					
Word length, bits	8	64	8	64	12
Decimal digits per word	2	15	2	8	4
Bytes (characters) per word	1	8	1	8	2
Operand length, words	Variable	Variable	Variable	Variable	1
Instruction length, words	Variable	Variable	Variable	Variable	1
CPU					
Model	—	Burroughs B 731	Burroughs B 1714	Burroughs B 1720	DEC PDP-8/A
Add time, microseconds	—	430	—	—	3.0
No. of programmable registers	None	4	—	—	6 + 8 in mem.
No. of I/O ports on basic system and maximum	8, 11	6, 8	2, 10	2, 14	3, 7
INTERNAL STORAGE					
Type	MOS	MOS	MOS	MOS	Core
Capacity of basic system, bytes	32K	32K	24K	48K	64K (6-bit)
Maximum capacity, bytes	60K	80K	128K	378K	64K (6-bit)
Increment size, bytes	4K	8K	8K	16, 32K	—
Cycle time, microseconds	1.0	1.0	1.5	1.0	1.2
Access time, microseconds	0.5	0.5	1.0	0.67	0.6
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Opt.; 6M bytes	Opt.; 243K bytes	No	No	Opt.; 1.2M bytes
Cartridge disk drive	Opt.; 27.6M bytes	Opt.; 36.8M bytes	Opt.; 74M bytes	Opt.; 74M bytes	Std.; 22.4M bytes
Pack disk drive	No	No	Opt.; 697.6M bytes	Opt.;697.6M bytes	No
Fixed-head disk/drum	No	No	Opt.; 1.9M bytes	Opt.; 70M bytes	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Optional	Optional	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.; 40 cps	Opt.;500,1000 cps	Opt.;500,1000 cps	Opt.; 120 cps
Paper tape punch	No	Opt.; 40 cps	Opt.; 100 cps	Opt.; 100 cps	Opt.; 120 cps
Punched card reader	No	Opt.; 600 cpm	Opt.;300-1400 cpm	Opt.;300-1400 cpm	Opt.; 300 cpm
Punched card punch	No	Opt.; 60 cpm	Opt.; 150 cpm	Opt.; 150 cpm	No
Punched card reader/punch	No	Opt.; 600/60 cpm	Opt.; 300/60 cpm	Opt.; 300/60 cpm	No
Serial printer	Std.; 60, 180 cps	Std.; 60 cps	No	No	Std.; 180 cps
Line printer	Opt.; 160,250 lpm	Opt.; 85-400 lpm	Opt.;85-1040 lpm	Opt., 85-1040 lpm	Opt.; 300 lpm
Reel-to-reel tape drive	No	Opt.; 10 KBS	Opt.; 10-120 KBS	Opt.; 10-120 KBS	Opt.; 36 KBS
Cassette tape drive	Std.; 1 KBS	Opt.; 1 KBS	Opt.; 1 KBS	Opt.; 1 KBS	Opt.; 10 KBS
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card devices	No	No	No	No	No
CRT	Standard; 8 x 32 char.	Optional; 24 x 80 char.	Optional; 24 x 80 char.	Optional; 24 x 80 char.	Standard; 12 x 80, 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	4	1	2	32	128
Synchronous	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 50K bps
Asynchronous	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Protocols supported	2780 bisync, BDLC	2780/3780 BDLC	2780 bisync, BDLC	2780 bisync, BDLC	2780 bisync
SOFTWARE SUPPORT					
COBOL	Yes	Yes	Yes	Yes	No
RPG	Yes	Yes	Yes	Yes	No
FORTRAN	No	No	Yes	Yes	Yes
BASIC	No	No	Yes	Yes	Yes
Assembler	No	No	No	No	Yes
Other programming languages	Data Control Sys.	AEL	UPL (Algol)	UPL (Algol)	COM
Multiprogramming	Yes; 3 partitions	Yes, see comments	Yes	Yes	Yes
Language implemented in firmware	Fully	Fully	Fully	Fully	Fully
Operating system implemented in firmware	Fully	Fully	Fully	Fully	Fully
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Whlsl.,dist.,med., financial, mfg.	All business acct'g. applications	All business, emulation	All business, emulation	Retlg., whlslg., mfg., list maint.
Data base management system	No	No	Yes	Yes	Yes
File access methods supported	Random, sequential, index seq.	Sequential	Random, index seq., index random	Random, index seq., index random	Random, sequential, index seq.
Software separately priced	Yes	Yes	Yes	Yes	No
Technical help separately priced	Yes	Yes	Yes	Yes	No
PRICING & AVAILABILITY					
Purchase price of basic system, $	$22,010 w/MCP	$20,900	$22,225	$87,300	$29,990
Monthly rental of basic system, $	$720 with MCP	$598	$735	$1,959	$660
Date of first U.S. delivery	April 1976	May 1973	3rd qtr. 1972	2nd qtr. 1973	1971
Number installed in U.S. to date	NA	NA	Over 1300 total	Over 1300 total	50 to 100
COMMENTS		AEL programs can exec. concurrently w./RPG or COBOL programs; B 730 supports up to 4 Dir. Data Entry Stations	See Report 70C-112-04 for more details	See Report 70C-112-04 for more details	

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

OCTOBER 1976

All About Small Business Computers

MANUFACTURER & MODEL	Cado Systems Corporation Model 1000	Cascade Data Concept II	Century Computer Opus III	Century Computer Century 400	CII Mitra 15-35
DATA FORMATS					
Word length, bits	8-bit byte	16	8	16	16 + 2
Decimal digits per word	2 per byte	2	2	4	2
Bytes (characters) per word	1 per byte	2	1	2	2
Operand length, words	0-4	1 to 256 bytes	1	1	1
Instruction length, words	1 byte	2-5 bytes	1-3	½ to 1½	1
CPU					
Model	Intel 8080A	Cascade Concept II	Century Comp. 200	Century Comp. 400	CII 15-35
Add time, microseconds	200 (9 digits)	8.8 (word)	2.6 (5 digits)	2.6 (5 digits)	2.3 (1 word)
No. of programmable registers	6	16	16	16	32
No. of I/O ports on basic system and maximum	2	—	2,256	2,256	4
INTERNAL STORAGE					
Type	MOS	Core	MOS	MOS	Core
Capacity of basic system, bytes	2K	16K	32K	32K	16
Maximum capacity, bytes	14K	64K	60K	240K	64
Increment size, bytes	1K	16K	16K, 32K	32K	16K, 32K
Cycle time, microseconds	1.1	1.2 per byte	0.6	0.6	0.800
Access time, microseconds	—	0.35 per byte	0.2	0.2	0.300
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Std.; 3.6M bytes	No	Opt.; 376K bytes	Opt.; 384K bytes	Opt.; 4M bytes
Cartridge disk drive	No	Std.; 40M bytes	Std.; 20M bytes	Std.; 20M bytes	Std.; 40M bytes
Pack disk drive	No	No	Opt.; 100M bytes	Opt.; 100M bytes	Opt.; 600M bytes
Fixed-head disk/drum	No	No	No	No	Opt.; 1.6M bytes
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	Standard	Standard	No
Full accounting keyboard	No	No	Optional	Optional	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Optional	Opt.; 300 cps	Opt.; 300, 400 cps	Opt.; 300, 400 cps	Opt.; 300 cps
Paper tape punch	Optional	Opt.; 75 cps	No	No	Opt.; 60 cps
Punched card reader	Optional	Opt.; 300 cpm	Opt.; 300, 600 cpm	Opt.; 300/600cpm	Opt.;300,600 cpm
Punched card punch	No	No	No	No	Opt.; 40 col./sec.
Punched card reader/punch	No	No	No	No	No
Serial printer	Optional	Opt.; 55 cps	Std.; 165 cps	Opt.; 165 cps	Opt.; 180 cps
Line printer	Std.; 300 lpm	Opt.; 125-600 lpm	Opt.;300,600 lpm	Std.; 300, 600 lpm	Opt.; 200-400 lpm
Reel-to-reel tape drive	Optional	Opt.; 30, 60 KBS	Opt.; 120 KBS	Opt.; 120 KBS	Opt.; 40 KBS
Cassette tape drive	No	No	Opt.; 300 cps	Opt.; 300 cps	Opt. (on ASR 33)
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Standard; 24 x 80 char.	Standard; 16 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Optional; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	1	8	256	256	64
Synchronous	Std.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 19,200 bps
Asynchronous	Std.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 1200 bps
Protocols supported	IBM 2770, 2780, 3780	2780 bisync	CCS	CCS	2780 bisync, SDLC, HDLC
SOFTWARE SUPPORT					
COBOL	No	No	No	No	Yes
RPG	No	Yes	No	No	No
FORTRAN	No	No	No	No	Yes
BASIC	Yes	No	Yes	Yes	No
Assembler	Yes	Yes	Yes	Yes	Yes
Other programming languages	None	None	CPL	CPL	PROCOL
Multiprogramming	No	Yes; 2 partitions	Yes; 10 partitions	Yes; 10 partitions	Yes
Language implemented in firmware	Fully	No	No	No	Partially
Operating system implemented in firmware	Fully	No	No	Partially	Partially
General accounting packages	Yes	Yes	Yes	Yes	No
Industry application areas	Dist. proc., text editing, data entry	Dist., route acctg., med., banking	Bus. acct'g., dist.	Bus. acct'g., dist.	Telecomm. network, bus. acct'g.
Data base management system	Yes	No	Yes	Yes	Yes
File access methods supported	Random, indexed sequential	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index seq.
Software separately priced	Yes	Some	Yes	Yes	Some
Technical help separately priced	No	Yes	Yes	Yes	No
PRICING & AVAILABILITY					
Purchase price of basic system, $	$13,950	$24,900	$32,070	$38,920	$28,000
Monthly rental of basic system, $	Purchase only	$747	Purchase only	Purchase only	Purchase only
Date of first U.S. delivery	April 1976	January 1970	February 1971	March 1975	1972 (Europe)
Number in U.S. to date	NA	150	Over 600	117	425 (Europe)
COMMENTS	Add $700 for 132-column printer; 2 floppy disk drives std.; 6 max.		Turnkey system for business accounting; all software sold separately.	Turnkey business accounting system with communications capability	

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

All About Small Business Computers

MANUFACTURER & MODEL	CII Mitra 105	CII Mitra 125	Cincinnati Milacron 40	Cincinnati Milacron 60	Cincinnati Milacron 70
DATA FORMATS					
Word length, bits	16 + 1	16 + 2	16	16	16
Decimal digits per word	2	2	1 to 256	1 to 256	1 to 256
Bytes (characters) per word	2	2	2	2	2
Operand length, words	½, 1, 2, string	—	½ to 2	½ to 2	½ to 2
Instruction length, words	1	1	½ to 3	½ to 3	½ to 3
CPU					
Model	CCI MP 105	CII 125	CIP/2200B	CIP/2200B	CIP/2200B
Add time, microseconds	1.75 (1 word)	1.9 (1 word)	18.5 (9 digits)	18.5 (9 digits)	13.5 (9 digits)
No. of programmable registers	6	64	3	3	3
No. of I/O ports on basic system and maximum	4	4	7	7	7
INTERNAL STORAGE					
Type	MOS, core	Core	MOS	MOS	MOS
Capacity of basic system, bytes	4K	32K	32K	32K	32K
Maximum capacity, bytes	32K	1024K	64K	64K	64K
Increment size, bytes	4K, 8K, 16K	32K	16K	16K	16K
Cycle time, microseconds	0.850/0.600	0.900	1.1 per byte	1.1 per byte	1.1 per byte
Access time, microseconds	0.400/0.350	0.350	0.66 per byte	0.66 per byte	0.66 per byte
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Opt.; 1M bytes	Opt.; 512K bytes	Std.; 2.5M bytes	Opt.; 2.5M bytes	Opt.; 2.5M bytes
Cartridge disk drive	No	Std.; 40M bytes	No	Std.; 90M bytes	Std.; 160M bytes
Pack disk drive	No	Opt.; 600M bytes	No	No	No
Fixed-head disk/drum	No	Opt.; 1.6M bytes	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	No	No	Optional	Optional	Optional
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 10 cps	Opt.; 300 cps	No	No	No
Paper tape punch	Opt.; 10 cps	Opt.; 60 cps	No	No	No
Punched card reader	No	Opt.;300,600 cpm	Opt.; 600 cpm	Opt.; 600 cpm	Opt.; 600 cpm
Punched card punch	No	Opt.; 40 card/sec	No	No	No
Punched card reader/punch	No	No	No	Opt.; 300/45-90	Opt.; 300/45-90
Serial printer	Opt.; 180 cps	Std.; 180 cps	Opt.; 60-330 cps	Opt.; 165,330 cps	Opt.; 165,330 cps
Line printer	No	Opt.; 200-600 lpm	No	Opt.;300,600 lpm	Opt.;300,600 lpm
Reel-to-reel tape drive	No	Opt.; 120 KBS	No	Opt.; 20 KBS	Opt. 20 KBS
Cassette tape drive	Optional	Optional	No	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.	Standard; 12 x 80, 24 x 80 char.	Standard; 12 x 80, 24 x 80 char.	Standard; 12 x 80, 24 x 80 char.
COMMUNICATIONS CAPABILITIES					
Maximum no. of lines	48	64	2	10	10
Synchronous	Opt.; 1000 bps	Opt.; to 100K bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Asynchronous	Opt.; 1200 bps	Opt.; to 9600 bps	Std.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Protocols supported	CCITT V.24	2780 bisync, SDLC, HDLC	2780 bisync	2780 bisync	2780 bisync
SOFTWARE SUPPORT					
COBOL	No	Yes	No	No	No
RPG	No	No	Yes	Yes	Yes
FORTRAN	Yes	Yes	No	No	No
BASIC	No	No	No	No	No
Assembler	Yes	Yes	Yes	Yes	Yes
Other programming languages	LP15	PROCOL (real-tm)	None	None	None
Multiprogramming	No	Yes	No	Yes; 2 partitions	Yes; 2 partitions
Language implemented in firmware	Partially	Partially	Fully	Fully	Fully
Operating system implemented in firmware	Partially	Partially	No	No	No
General accounting packages	No	No	Yes	Yes	Yes
Industry application areas	Business accounting	Telecomm. network, bus acct'g.	Business accounting	Business accounting	Business accounting
Data base management system	No	Yes	No	No	No
File access methods supported	Indexed sequential	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index seq.
Software separately priced	Yes	Some	Some	Some	Some
Technical help separately priced	Yes	No	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$7,000	$35,000	$16,100	$26,100	$26,200
Monthly rental of basic system, $	Purchase only	Purchase only	$482	$781	$784
Date of first U.S. delivery	June 1976 (Eur.)	1Q 1976 (Europe)	January 1977	June 1973	June 1973
Number installed	75 (Europe)	185 (Europe)	NA	NA	NA
COMMENTS					

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

All About Small Business Computers

MANUFACTURER & MODEL	Cincinnati Milacron 80	Codon CS-12	Codon CS-20	Complete Computer Systems II-3	Complete Computer Systems III-3
DATA FORMATS					
Word length, bits	16	12	12	16	16
Decimal digits per word	1 to 256	2	2	4	4
Bytes (characters) per word	2	2	2	2	2
Operand length, words	½ to 2	1, 2	1, 2	1	1
Instruction length, words	½ to 3	1	1	1	1
CPU		DEC	DEC		
Model	CIP/4400	Datasystem 310	Datasystem 340	DG Nova 3/12	DG Nova 3/12
Add time, microseconds	18.5 (9 digits)	3.0 (1 word)	2.6 (1 word)	0.700 (1 word)	0.700 (1 word)
No. of programmable registers	3	8 + 8 in mem.	8 + 8 in mem.	16	16
No. of I/O ports on basic system and maximum	14	2, 5	—	1, 2	1, 2
INTERNAL STORAGE					
Type	MOS	Core	Core	MOS	MOS
Capacity of basic system, bytes	64K	16K (6-bit)	16K (6-bit)	64K	64K
Maximum capacity, bytes	96K	64K (6-bit)	64K (6-bit)	256K	256K
Increment size, bytes	32K	16K (6-bit)	16K (6-bit)	32K	32K
Cycle time, microseconds	0.9	1.4	1.2	0.7	0.7
Access time, microseconds	0.6	0.7	0.6	0.5	0.5
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Opt.; 2.5M bytes	Std.; 512K bytes	Opt.; 512K bytes	Opt.; 512K bytes	Opt.; 512K bytes
Cartridge disk drive	Std.; 160M bytes	Opt.; 26M bytes	Std.; 26M bytes	Std.; 46.4M bytes	Std.; 46.4M 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	Optional	Standard	Standard	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	No	Opt.; 300 cps	Opt.; 400 cps	Opt.; 400 cps
Paper tape punch	No	No	Opt.; 50 cps	Opt.; 60 cps	Opt.; 60 cps
Punched card reader	Opt.; 600 cpm	No	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm
Punched card punch	No	No	No	No	No
Punched card reader/punch	Opt.; 300/45-90	No	No	No	No
Serial printer	Opt.; 165, 330 cps	Opt.; 30, 180 cps	Opt.; 30, 180 cps	Std.; 165 cps	Std.; 660 cps
Line printer	Opt.; 300, 600 lpm	Opt.; 300 lpm	Opt.; 300 lpm	Opt.; 300 lpm	Opt.; 300 lpm
Reel-to-reel tape drive	Opt.; 20 KBS	No	Opt.; 36 KBS	Opt.; 36 KBS	Opt.; 36 KBS
Cassette tape drive	No	No	No	Opt.; 1.6 KBS	Opt.; 1.6 KBS
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Standard; 12 x 80, 24 x 80 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	26	1	8	5	9
Synchronous	Opt. to 9600 bps	Opt.; 1200, 2400	Opt.; 1200, 2400	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	2780 bisync	2780/3780 bisync	2780/3780 bisync	None	None
SOFTWARE SUPPORT					
COBOL	No	No	No	No	No
RPG	Yes	Yes	Yes	No	No
FORTRAN	No	No	No	Yes	Yes
BASIC	No	No	No	Yes	Yes
Assembler	Yes	Yes	Yes	Yes	Yes
Other programming languages	None	DEAL	DEAL	CREATE	CREATE
Multiprogramming	Yes; 2 partitions	Yes; 9F + 1B	Yes; 9F + 1B	Yes	Yes
Language implemented in firmware	Fully	No	No	Partially	Partially
Operating system implemented in firmware	No	No	No	Partially	Partially
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Business accounting	Distribution	Distribution	Mfg., const., dist.	Mfg., const., dist.
Data base management systems	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	Some	Yes	Yes	Yes	Yes
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$42,800	$32,000	$37,450	$36,000	$48,000
Monthly rental of basic system, $	$1,281	Purchase only	Purchase only	$1,028	$1,356
Date of first U.S. delivery	July 1976	1975	1972	October 1976	October 1976
Number installed in U.S. to date	NA	40	50	NA	NA
COMMENTS					Includes two work stations

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

All About Small Business Computers

MANUFACTURER & MODEL	Complete Computer Systems IV-3	Compucorp 402	Compucorp 450	Compucorp 450/D	Compucorp 450/DP
DATA FORMATS					
Word length, bits	16	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	16	—	—	—	—
No. of I/O ports on basic system and maximum	1, 2	—	—	—	—
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.; 512K bytes	Std.; 1.2M bytes	Std.; 1.2M bytes	Std.; 1.2M bytes	Std.; 1.2M bytes
Cartridge disk drive	Std.; 92.8M 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.; 60 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.; 165 cps	Std.; 30 cps	Opt.; 30 cps	Opt.; 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	Standard; 24 x 80 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	17	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	None	None	None	None	None
SOFTWARE SUPPORT					
COBOL	No	No	No	No	No
RPG	No	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 (dt. bs.)	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	Mfg., const., dist.	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	Random, sequential, 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, $	$64,000	$12,880	$11,490	$14,550	$15,320
Monthly rental of basic system, $	$1,786	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	Includes two work stations	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.

All About Small Business Computers

MANUFACTURER & MODEL	Compucorp 450/OPD	Computer Automation SyFA	Computer Covenant CPBS 1	Computer Covenant CPBS 2	Computer Covenant CPBS 3
DATA FORMATS					
Word length, bits	64	16	16	16	16
Decimal digits per word	13	2	2	2	2
Bytes (characters) per word	8	2	2	2	2
Operand length, words	1, 2	1 bit to 255 bytes	1, 2	1, 2	1, 2
Instruction length, words	1-7 bytes	1, 2	1	1	1
CPU					
Model	Compucorp 3000	CA LSI 2/60	DEC PDP-11/04	DEC PDP-11/34	DEC PDP-11/70
Add time, microseconds	80 (13 digits)	76 (5 digits)	3.2 (1 word)	3.2 (1 word)	0.40 (1 word)
No. of programmable registers	—	2	8	9	10
No. of I/O ports on basic system and maximum	—	2, 6	9	4	26
INTERNAL STORAGE					
Type	MOS	Core	Core	Core	Core
Capacity of basic system, bytes	16K	64K	56K	64K	256K
Maximum capacity, bytes	16K	304K	56K	248K	2048K
Increment size, bytes	None	16K	None	16K	64K, 256K
Cycle time, microseconds	—	1.2	0.98	0.98	0.98
Access time, microseconds	—	0.5	0.49	0.49	0.49
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Std.; 1.2M bytes	No	Std.; 512K bytes	Opt.; 512K bytes	No
Cartridge disk drive	No	Std.; 40M bytes	Opt.; 10M bytes	Std.; 10M bytes	Opt.; 10M bytes
Pack disk drive	No	Opt.; 640M bytes	No	Opt.; 1408M bytes	Std.; 1408M bytes
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Optional	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	No	No	No	No
Paper tape punch	No	No	No	No	No
Punched card reader	No	No	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.; 30 cps	Opt.; 100, 165, cps	Std.; 30, 180 cps	Std.; 30, 180 cps	Std.; 30, 180 cps
Line printer	No	Opt.; 300, 600 lpm	Opt.; 300 lpm	Opt.; 300-1200 lpm	Opt.; 300-1200 lpm
Reel-to-reel tape drive	No	No	Opt.; 10-120 KBS	Opt.; 10-120 KBS	Opt.; 10-120 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.	Optional; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. lines	7	25	16	40	80
Synchronous	No	Opt.; to 4800 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Asynchronous	Std.; to 4800 bps	Std.; to 2400 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Protocols supported	None	IBM 2780/3780, HASP	IBM 2780, bisync, SDLC, DDCMP	IBM 2780, bisync, SDLC, DDCMP	IBM 2780, bisync, BDLC, DDCMP
SOFTWARE SUPPORT					
COBOL	No	No	Yes	Yes	Yes
RPG	No	No	No	No	No
FORTRAN	No	Yes	Yes	Yes	Yes
BASIC	No	Yes	Yes	Yes	Yes
Assembler	Yes	No	Yes	Yes	Yes
Other programming languages	None	SYBOL	None	Yes	Yes
Multiprogramming	No	Yes; 43 partitions	Yes; 16 partitions	Yes; 40 partitions	Yes; 80 partitions
Language implemented in firmware	Partially	No	No	No	No
Operating system implemented in firmware	Fully	No	No	No	No
General accounting packages	No	No	Yes	Yes	Yes
Industry application areas	Agric. bus., gen'l. bus.	Distributed processing	Manufacturing, dist./wholesale	Manufacturing, dist./wholesale	Manufacturing, dist./wholesale
Data base management system	Yes	No	TOTAL, RMS-11	TOTAL, RMS-11	DBMS-11
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	No	Yes	Yes	Yes	Yes
Technical help separately priced	Yes	No	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$18,390	$45,000	$24,000	$42,000	$100,000
Monthly rental of basic system, $	Purchase only	NA	$530 (5-yr. lease)	$910 (5-yr. lease)	$2,150 (5-yr. lease)
Date of first U.S. delivery	April 1976	1976	June 1976	September 1976	December 1976
Number installed in U.S. to date	20	NA	NA	NA	NA
COMMENTS		Supports up to 24 terminals, at $2,750 each; supports 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 available

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

All About Small Business Computers

MANUFACTURER & MODEL	Computer Hardware Inc. 2120	Computer Hardware Inc. 2130	Computer Hardware Inc. 3230	Computer Horizons CHC Distribution System	Computer Interactions Inc. Compo-II
DATA FORMATS					
Word length, bits	16	16	16	16	12
Decimal digits per word	—	—	—	2	3
Bytes (characters) per word	2	2	2	2	2 (6-bit)
Operand length, words	1-2	1-2	1-2	½ or 1	1
Instruction length, words	1-4	1-4	1,4	1-3	1, 2
CPU					
Model	CHI	CHI	CHI	DEC PDP-11/34	DEC PDP-8/E or F
Add time, microseconds	3.6 (1 word)	1.6 (1 word)	1.6 (1 word)	2 (1 word)	15 (5 digits)
No. of programmable registers	8	8	8	8	8
No. of I/O ports on basic system and maximum	21, 100	21, 100	21, 100	3, 7	3, 32
INTERNAL STORAGE					
Type	MOS	Core	MOS	MOS, core	Core, MOS
Capacity of basic system, bytes	16K	16K	16K	16K	16K
Maximum capacity, bytes	32K	130K	512K	248K	64K
Increment size, bytes	16K	16K	16K	16K, 32K, 64K	8K
Cycle time, microseconds	1.8	0.8	0.8	0.49, 0.725, 0.98	1.2
Access time, microseconds	0.35	0.25	0.2	—	0.6
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	No	No	Opt.; 256K bytes
Cartridge disk drive	No	No	No	No	Std.; 26M bytes
Pack disk drive	Std.; 20M bytes	Std.; 320M bytes	Std.; 460M bytes	Std.; 88M bytes	Opt.; 90M bytes
Fixed-head disk/drum	No	No	Opt.; 2M bytes	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Optional	No	Yes
10-key numeric keyboard	No	No	Optional	No	Yes
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 300 cps	Opt.; 300 cps	Opt.; 300 cps	No	Opt.; 300 cps
Paper tape punch	Opt.; 110 cps	Opt.; 110 cps	Opt.; 110 cps	No	Opt.; 60 cps
Punched card reader	Opt.;300-1000	Opt.; 300-1000	Opt.; 300-1000	No	Opt.; 600-1200
Punched card punch	No	No	No	No	No
Punched card reader/punch	Opt.; 300/60 cpm	Opt.; 300/60 cpm	Opt.; 300/60 cpm	No	No
Serial printer	No	No	To be announced	Std.; 180 cps	Opt.; 165, 300 cps
Line printer	Opt.; 300, 600 lpm	Opt.;300, 600 lpm	Opt.;300, 600 lpm	Opt.; 1200 lpm	Std.; 300 lpm
Reel-to-reel tape drive	Optional	Optional	Optional	Std.; 75 ips	Opt.; 20, 40 KBS
Cassette tape drive	No	No	No	No	No
Cartridge tape drive	No	No	No	No	Opt.; 40 KBS
Magnetic ledger card device	No	No	No	No	No
CRT	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Optional; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	—	—	—	64	32
Synchronous	Opt.; to 4800 bps	Opt.; to 4800 bps	Opt.; to 4800 bps	Opt.; to 9600 bps	Opt.; to 2400 bps
Asynchronous	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt. tp 2400 bps
Protocols supported	—	—	—	DDCMP, SDLC, HDLC, ADDCP	None
SOFTWARE SUPPORT					
COBOL	Yes	Yes	Yes	Yes	No
RPG	Yes	Yes	Yes	No	No
FORTRAN	Yes	Yes	Yes	No	No
BASIC	No	No	No	Yes	Yes
Assembler	Yes	Yes	Yes	No	Yes
Other programming languages	None	None	None	None	None
Multiprogramming	No	Yes	Yes	Yes, 32	Yes, 4
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	—	—	—	Inv., order proc., business acct'g.	Wholesale dist., pharm., medical
Data base management system	Yes	Yes	Yes	No	No
File access methods supported	—	—	—	Sequential, indexed sequential	Random, sequential, index seq.
Software separately priced	Yes	Yes	Yes	No	No
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$29,000	$60,000	$77,000	$30,000	$50,000
Monthly rental of basic system, $	$860 (2-yr. lease)	$1,800 (2-yr. lease)	$1,956 (5-yr. lease)	No	$1,200 (5-yr. lease)
Date of first U.S. delivery	1975	1974	1976	NA	2nd quarter 1972
Number installed in U.S. to date	NA	NA	NA	0	50
COMMENTS				DEC PDP-11/70 CPU can also be used	System has paged memory

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

OCTOBER 1976

All About Small Business Computers

MANUFACTURER & MODEL	Computer Technology CTL 8010	Computer Technology CTL 8030	Computer Technology CTL 8050	Control Data Cyber 18-10	Control Data Cyber 18-20
DATA FORMATS					
Word length, bits	16	16	16	16	16
Decimal digits per word	5	5	5	—	—
Bytes (characters) per word	2	2	2	2	2
Operand length, words	1	1	1	—	—
Instruction length, words	1	1	1	1-3	1-3
CPU					
Model	CTL 8010	CTL 8030	CTL 8050	Cyber 18-10	Cyber 18-20
Add time, microseconds	2.0 (1 word)	1.3 (1 word)	1.2 (1 word)	1.76 (1 word)	1.76 (1 word)
No. of programmable registers	—	5	6	22	22
No. of I/O ports on basic system and maximum	8, 8	8, 25	8, 72	2 per memory mod.	2 per memory mod.
INTERNAL STORAGE					
Type	MOS	MOS	Core	Core, MOS	MOS
Capacity of basic system, bytes	16K	56K	96K	32K	32K
Maximum capacity, bytes	112K	112K	448K	64K	256K
Increment size, bytes	8K	8K	8K	16K	32K, 64K
Cycle time, microseconds	—	—	—	0.75	0.75
Access time, microseconds	—	—	—	0.3	0.3
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	No	Opt.; 560K bytes	Opt.; 560K bytes
Cartridge disk drive	No	Std.; 38.4M bytes	Std.; 38.4M bytes	No	No
Pack disk drive	No	Opt.; 384M bytes	Opt.; 384M bytes	No	Opt.; 400M 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	Optional	Optional	Optional	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 500 cps	Std.; 500 cps	Std.; 500 cps	No	No
Paper tape punch	Opt.; 75 cps	Opt.; 75 cps	Opt.; 75 cps	No	No
Punched card reader	Std.; 400 cpm	Opt.; 400 cpm	Opt.;400, 600 cpm	Std.;300, 600 cps	Std.;300, 600 cps
Punched card punch	No	No	No	No	No
Punched card reader/punch	No	No	No	No	No
Serial printer	Opt.; 165 cps	Opt.; 165 cps	Opt.; 165 cps	No	No
Line printer	Std.; 300, 600 lpm	Opt.;300, 600 lpm	Std.;300, 600 lpm	Opt.;300, 600 lpm	Opt.; 300, 600 lpm
Reel-to-reel tape drive	No	No	Opt.; 120 KBS	Opt.; 20 KBS	Opt.; 20 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	Optional; 25 x 80 char.	Optional; 25 x 80 char.	Optional; 25 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	2	36	108	—	—
Synchronous	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Asynchronous	No	Opt.;600,1200 bps	Opt.;600,1200 bps	Opt.; to 19.2K bps	Opt.; to 19.2K bps
Protocols supported	IBM 2780/3780, ICL 7020, HASP, CDC 200	IBM 2780/3780, ICL 7020, HASP	IBM 2780/3780, ICL 7020, HASP, CDC 200	IBM 2780/3780, HASP, CDC 200	—
SOFTWARE SUPPORT					
COBOL	No	Yes	Yes	No	No
RPG	No	No	No	No	No
FORTRAN	Yes	Yes	Yes	No	Yes
BASIC	Yes	Yes	Yes	No	Yes
Assembler	No	No	Yes	Yes	Macro assembler
Other programming languages	No	CORAL,Rpt.Gen.	CORAL, Rpt. Gen.	None	None
Multiprogramming	Yes; 13 partitions	Yes; 32 partitions	Yes; 64 partitions	No	Yes; 16 partitions
Language implemented in firmware	No	No	No	No	No
Operating system implemented in firmware	No	No	No	No	No
General accounting packages	No	Yes	Yes	No	No
Industry application areas	Scientific, engrg., education	Transaction proc., all bus. appl.	Time-sharing	Under development	Manufacturing, distribution
Data base management system	No	No	No	No	No
File access methods supported	—	Random, sequential, index seq.	Random, sequential, index seq.	—	—
Software separately priced	—	Some	Some	Yes	Yes
Technical help separately priced	—	No	No	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$23,140	$44,500	$80,100	$27,840	$29,940
Monthly rental of basic system, $	Purchase only	Purchase only	Purchase only	$933 (3-yr. lease)	$981 (3-yr. lease)
Date of first U.S. delivery	NA	NA	May 1976 (U.K.)	May 1976	August 1976
Number installed in U.S. to date	NA	NA	NA	NA	NA
COMMENTS				Lower prices for quantity purchasers; full-payout 5-yr. lease plans also available	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.

All About Small Business Computers

MANUFACTURER & MODEL	Corstar Business Computing Company Corstar 310	Corstar Business Computing Company Corstar 350	Corstar Business Computing Company Corstar 534	Corstar Business Computing Company Corstar 570	Data General Eclipse C/300
DATA FORMATS					
Word length, bits	12	16	16	16	16
Decimal digits per word	2	2	2	2	4
Bytes (characters) per word	2 (6-bit)	2	2	2	2
Operand length, words	1, 2	1, 2	1, 2	1, 2	Variable
Instruction length, words	1, 2	1, 2	1, 2	1, 2	1, 2
CPU					
Model	DEC Datasystem 310	DEC Datasystem 350	DEC Datasystem 534	DEC Datasystem 570	Data Gen. C/300
Add time, microseconds	2.8	7.0 (11/10); 1.0 (11/40)	6.0	2.7	0.6 (5 digits)
No. of programmable registers	8	8; 10	10	16	8
No. of I/O ports on basic system and maximum	—	—	—	—	64
INTERNAL STORAGE					
Type	Core, MOS	Core	Core, MOS	Core	Core, MOS
Capacity of basic system, bytes	16K (6-bit)	32K	64K	128K	96K
Maximum capacity, bytes	64K (6-bit)	64K	248K	1024K	256K
Increment size, bytes	16K (6-bit)	32K	16K	64K	16K
Cycle time, microseconds	1.4	0.98	0.98; 0.725	0.98	0.8; 0.7
Access time, microseconds	0.7	0.49	0.49; 0.500	0.49	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Std.; 1.2M bytes	No	No	No	Opt.; 2.2M bytes
Cartridge disk drive	Opt.; 12.8M bytes	Std.; 19.2M bytes	Std.; 19.2M bytes	Std.; 19.2M bytes	Std.; 40M bytes
Pack disk drive	No	Opt.; 160M bytes	Opt.; 704M bytes	Std.; 1408M bytes	Opt.; 360M bytes
Fixed-head disk/drum	No	No	No	No	Opt.; 4M bytes
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	Optional	Optional	Optional	Optional	Opt.; 400 cps
Paper tape punch	Optional	Optional	Optional	Optional	Opt.; 75 cps
Punched card reader	Optional	Optional	Optional	Optional	Opt.; to 1000 cpm
Punched card punch	No	No	No	No	Opt.; to 150 cpm
Punched card reader/punch	No	No	No	No	No
Serial printer	Std.; 180 cps	Std.; 180 cps	Opt.; 180 cps	Opt.; 180 cps	Opt.; 165 cps
Line printer	Opt.; 300 lpm	Opt.; 300 lpm	Std.; 300 lpm	Std.; 300 lpm	Opt.; to 1200 lpm
Reel-to-reel tape drive	No	Optional	Optional	Optional	Std.; 10-72 KBS
Cassette tape drive	No	No	No	No	Opt.; 1.6 KBS
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Standard; 12 x 80, 24 x 80 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	1	4	32	63	256
Synchronous	Opt.; to 2200 bps	Opt.; to 2200 bps	Opt.; to 2200 bps	Opt.; to 2200 bps	Opt.; to 48K bps
Asynchronous	No	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Protocols supported	IBM 2780	IBM 2780	IBM 2780	IBM 2780	Bi-sync 2780/3780, HASP II
SOFTWARE SUPPORT					
COBOL	No	No	Yes	Yes	Yes
RPG	No	No	RPG II	RPG II	Yes
FORTRAN	No	No	Yes	Yes	Yes
BASIC	No	No	BASIC Plus	BASIC Plus	Yes
Assembler	No	No	No	No	Yes
Other multiprogramming languages	DIBOL	DIBOL	None	None	None
Multiprogramming	No	Yes; 4 partitions	Yes; 32 partitions	Yes; 63 partitions	Yes; 2 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	Manufacturing, distribution	Manufacturing, distribution	Advert. agency, financial	Financial, publishing	....
Data base management system	No	No	No	No	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	COBOL only
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$13,000-$23,000	$36,000-$65,000	$75,000-$125,000	$135,000-$250,000	$80,000 (approx.)
Monthly rental of basic system, $	Purchase only	Purchase only	Purchase only	Purchase only	$1,760 (approx.)
Date of first U.S. delivery	1972	October 1975	November 1973	June 1975	July 1975
Number installed in U.S. to date	10	4	14	4	NA
COMMENTS					System includes a 200-nanosecond, 16-word, bipolar cache memory

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

All About Small Business Computers

MANUFACTURER & MODEL	Datapoint Cassette 1100	Datapoint Diskette 1100	Datapoint 2200	Datapoint 5500	Datasaab Systems, Inc. D15
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	1 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	1-255
Instruction length, words	1-3 bytes	1-3 bytes	1-3 bytes	1-3 bytes	1-8
CPU					Datasaab
Model	Datapoint 1100	Datapoint 1100	Datapoint 2200	Datapoint 5500	5051, 5052
Add time, microseconds	4.8	4.8	4.8	1.4	
No. of programmable registers	14	14	14	16	8
No. of I/O ports on basic system and maximum	14	14	22	30	63
INTERNAL STORAGE					
Type	MOS	MOS	MOS	MOS	Core
Capacity of basic system, bytes	4K	16K	4K	48K	16K
Maximum capacity, bytes	8K	16K	16K	48K	64K
Increment size, bytes	4K	None	4K	None	16K
Cycle time, microseconds	3.2	3.2	3.2	1.6	0.95-1.2
Access time, microseconds	1.6	1.6	1.6	0.8	0.3
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	Std.; 1M bytes	Opt.; 1M bytes	Opt.; 1M bytes	No
Cartridge disk drive	No	No	Opt.; 9.6M bytes	Opt.; 9.6M bytes	Std.; 40M bytes
Pack disk drive	No	No	Opt.; 50M bytes	Opt.; 200M bytes	No
Fixed,head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Optional
10-key numeric keyboard	Standard	Standard	Standard	Standard	Optional
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	No	No	No	Opt.; 500 cps
Paper tape punch	No	No	No	No	Opt. 75 cps
Punched card reader	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm	No
Punched card punch	No	No	No	No	No
Punched card reader/punch	No	No	No	No	No
Serial printer	Opt.; 120 cps	Opt.; 120 cps	Opt.; 120 cps	Opt.; 120 cps	Opt.; 15-330 cps
Line printer	Opt.;300,600 lpm	Opt.;300, 600 lpm	Opt.; 300, 600 lpm	Opt.;300, 600 lpm	Opt.; 200 lpm
Reel-to-reel tape drive	Opt.; 9.6-20 KBS	Opt.; 9.6-20 KBS	Opt.; 9.6-20 KBS	Opt.; 9.6-20 KBS	Optional
Cassette tape drive	Std.; 352 cps	No	Std.; 352 cps	Std.; 352 cps	Opt.; 756 cps
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.	Standard; 12 x 80 char.	Standard; 12 x 80 char.	Optional; 16 x 64, 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	1	1	8	16	3
Synchronous	Opt.; to 9600 bps	Opt.; to 9600 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 9600 bps	No
Protocols supported	IBM 2265, 2741, 2780/3780, HASP	IBM 2265, 2741, 2780/3780, HASP	IBM 2265, 2741, 2780/3780, HASP	IBM 2265, 2741, 2780/3780, HASP	None
SOFTWARE SUPPORT					
COBOL	No	No	No	No	No
RPG	Yes	Yes	Yes	Yes	No
FORTRAN	No	No	No	No	No
BASIC	Yes	Yes	Yes	Yes	No
Assembler	Yes	Yes	Yes	Yes	No
Other programming languages	DATABUS, SCR.	DATABUS, SCR.	DATABUS, SCR.	DATABUS, SCR.	Logic-3/Mall
Multiprogramming	No	No	No	Yes; 3 partitions	Yes; 16 partitions
Language implemented in firmware	No	No	No	No	No
Operating system implemented in firmware	No	No	No	No	No
General accounting packages	No	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.	Dist., manuf., travel agency
Data base management system	Yes	Yes	Yes	Yes	No
File access methods supported	Sequential	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index seq.	Direct, sequential, index seq.
Software separately priced	Yes	Yes	Yes	No	Some
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$7,200	$12,880	$8,571	$33,888	$35-$150,000
Monthly rental of basic system, $	$165 (2-yr. lease)	$214 (2-yr. lease)	$216 (2-yr. lease)	$855 (2-yr. lease)	NA
Date of first U.S. delivery	January 1974	February 1975	April 1972	1975	NA
Number installed in U.S. to date	3500	2500	9000	500	NA
COMMENTS	DATAFORM and DATASHARE program languages also supported	DATAFORM and DATASHARE program languages also supported	DATAFORM and DATASHARE program languages also supported	DATAFORM and DATASHARE program languages also supported	System has been available in Europe for some time; pricing has not been established for the U.S. at this time

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

All About Small Business Computers

MANUFACTURER & MODEL	Decision Data Computer Corp. System/4	Design Data N312	Design Data EC300	Digital Computer Controls 1500	Digital Computer Controls 2500
DATA FORMATS					
Word length, bits	8-bit byte	16	16	16	16
Decimal digits per word	2 per byte	2	2	4	4
Bytes (characters) per word	1 per byte	2	2	2	2
Operand length, words	1 byte	1	1	1, 2	1, 2
Instruction length, words	2-4 bytes	1	1	1	1
CPU					
Model	System/4	DG Nova 3/12	DG Eclipse C/300	DCC 416	DCC Mod Five
Add time, microseconds	—	0.95; 0.7	2.4	1.6 (1 word)	—
No. of programmable registers	6	8	12	12	12
No. of I/O ports on basic system and maximum	5; 8	64	64	3, 62	3, 62
INTERNAL STORAGE					
Type	MOS	Core; MOS	Core	Core	Core: MOS
Capacity of basic system, bytes	32K	64K	96K	48K	48K
Maximum capacity, bytes	64K	256K	256K	64K	256K
Increment size, bytes	16K	32K	16K	8K	8, 16, 32, 64K
Cycle time, microseconds	1	1.0; 0.7	0.8	1.6	0.900
Access time, microseconds	0.5	—	0.4	0.800	0.450
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Std.; 3M bytes	Std.; 1.2M bytes	No	Std.; 3M bytes	Opt.; 3M bytes
Cartridge disk drive	Opt.; 40M bytes	Opt.; 10M bytes	Opt.; 10M bytes	No	Std.; 40M bytes
Pack disk drive	No	Opt.; 92M bytes	Opt.; 92M bytes	No	Opt.; 320M 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	No	No	Standard	Standard
Full accounting keyboard	Standard	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	Std.; 400 cps	Opt.; 400 cps	Opt.; 300 cps	Opt.; 300 cps
Paper tape punch	No	Opt.; 62.2 cps	Opt.; 62.2 cps	Opt.; 75 cps	Opt.; 75 cps
Punched card reader	Opt.; 300-1200	Optional	Optional	Opt.;150-600 cpm	Opt.;150-600 cpm
Punched card punch	No	No	No	Opt.; 100 cpm	Opt.; 100 cpm
Punched card reader/punch	Opt.; 300/120 cpm	No	No	No	No
Serial printer	Std.; 120 cps	Std.; 165 cps	Std.; 165 cps	Std.; 30, 265 cps	Std.; 265 cps
Line printer	Opt.; 300 lpm	Opt.; to 1200 lpm	Opt.; to 1200 lpm	Opt.; 300 lpm	Opt.; 125-600 lpm
Reel-to-reel tape drive	No	Optional	Standard	No	No
Cassette tape drive	No	Optional	Optional	Opt.; 1.5 KBS	Opt.; 1.5 KBS
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card devices	No	No	No	No	No
CRT	Standard; 24 x 80 char.	Standard; 22 x 90 char.	Standard; 22 x 90 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	2	32	256	2	16
Synchronous	Std.; to 9600 bps	Optional	Optional	Opt.; to 9600 bps	Opt.; to 9600 bps
Asynchronous	Opt.; to 9600 bps	Standard	Standard	Opt.; to 9600 bps	Opt.; to 9600 bps
Protocols supported	IBM 2780/3780	IBM 2780/3780	IBM 2780/3780, HASP	None	None
SOFTWARE SUPPORT					
COBOL	No	No	Yes	No	Yes
RPG	Yes	No	Yes	No	No
FORTRAN	No	Yes	Yes	Yes	Yes
BASIC	No	Yes	Yes	Yes	Yes
Assembler	No	Yes	Yes	Yes	Yes
Other programming languages	Phrase	ALGOL	ALGOL	None	None
Multiprogramming	Yes; 2 partitions	Yes; 2 partitions	Yes; 2 partitions	Yes; 5 partitions	Yes; 16 partitions
Language implemented in firmware	No	No	No	Partially	Partially
Operating system implemented in firmware	Partially	No	No	Partially	Partially
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Distribution	Manufacturing, order entry	Manufacturing, order entry	Business accounting	Business accounting
Data base management system	No	No	Yes	No	Yes
File access methods supported	Direct, sequential, index seq.	Index sequential	Random, sequential, index seq.	Sequential, multi-key, index seq.	Sequential, multi-key, index seq.
Software separately priced	Some	Yes	Yes	No	No
Technical help separately priced	Some	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$20,000	$31,000	$60,000	NA	NA
Monthly rental of basic system, $	NA.	Purchase only	Purchase only	NA	NA
Date of first U.S. delivery	July 1975	January 1974	November 1975	NA	NA
Number installed in U.S. to date	15	15	5	NA	NA
COMMENTS	System/4 is currently being marketed only in the metropolitan Philadelphia by a network of dealers				

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

All About Small Business Computers

MANUFACTURER & MODEL	Digital Computer Controls 3700	Digital Equipment Corp. Datasystem 310	Digital Equipment Corp. Datasystem 352	Digital Equipment Corp. Datasystem 354	Digital Equipment Corp. Datasystem 356
DATA FORMATS					
Word length, bits	16	12	16	16	16
Decimal digits per word	4	2	2	2	2
Bytes (characters) per word	2	2 (6-bit)	2	2	2
Operand length, words	1, 2	1	½, 1, 2	½, 1, 2	½, 1, 2
Instruction length, words	1	1	1	1	1
CPU					
Model	DCC 616	DEC PDP-8/A	DEC PDP-11/10	DEC PDP-11/10 or /40	DEC PDP-11/10 or /40
Add time, microseconds	0.800, 0.66 (word)	1000 (15 digits)	7.0 (word)	7.0, 1.07 (word)	7.0, 1.07 (word)
No. of programmable registers	12	8 + 8 in mem.	8	8, 9	8, 9
No. of I/O ports on basic system and maximum	3, 62	2, 12	2, 13	2, 15	2, 18
INTERNAL STORAGE					
Type	Core, MOS	Core	Core	Core	Core
Capacity of basic system, bytes	64K	16K (6-bit)	32K	32K	32K
Maximum capacity, bytes	1024K	64K (6-bit)	56K	56K	56K
Increment size, bytes	16K	16K, 32K (6-bit)	16K	16K	16K
Cycle time, microseconds	0.800, 0.660	1.4	0.980	0.980	0.980
Access time, microseconds	0.400, 0.400	0.700	0.490	0.490	0.490
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Opt.; 3.0M bytes	Std.; 670K bytes	Std.; 512K bytes	Opt.; 512K bytes	Opt.; 512K bytes
Cartridge disk drive	Std.; 40M bytes	Opt.; 12.8M bytes	Opt.; 19.2M bytes	Std.; 19.2M bytes	Opt.; 19.2M bytes
Pack disk drive	Opt.; 320M bytes	No	Opt.; 160M bytes	Opt.; 160M bytes	Std.; 160M 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	Opt.; 300 cps	No	No	No	No
Paper tape punch	Opt.; 75 cps	No	No	No	No
Punched card reader	Opt.; 150-600 cpm	No	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm
Punched card punch	Opt.; 100 cpm	No	No	No	No
Punched card reader/punch	No	No	No	No	No
Serial printer	Std.; 265 cps	Opt.; 30,165 cps	Opt.; 30, 180 cps	Opt.; 30, 180 cps	Opt.; 30, 180 cps
Line printer	Opt.; 125-600 lpm	Opt.; 300 lpm	Opt.; 60-300 lpm	Opt.; 60-300 lpm	Opt.; 60-300 lpm
Reel-to-reel tape drive	—	No	Opt.; 10-72 KBS	Opt.; 10-72 KBS	Opt.; 10-72 KBS
Cassette tape drive	Opt.; 1.5 KBS	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.	Optional; 12 x 80 char.	Optional; 12 x 80, 24 x 80 char.	Optional; 12 x 80, 24 x 80 char.	Optional; 12 x 80, 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	32	1	5	5	5
Synchronous	Opt.	Opt.; to 4800 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Asynchronous	Opt.	No	Opt.; 300 bps	Opt.; 300 bps	Opt.; 300 bps
Protocols supported	None	IBM 2780	IBM 2780	IBM 2780	IBM 2780
SOFTWARE SUPPORT					
COBOL	Yes	No	No	No	No
RPG	No	No	No	No	No
FORTRAN	Yes	No	No	No	No
BASIC	Yes	No	No	No	No
Assembler	Yes	No	No	No	No
Other programming languages	None	DIBOL (COBOL)	DIBOL (COBOL)	DIBOL (COBOL)	DIBOL (COBOL)
Multiprogramming	Yes; 32 partitions	No	No	Yes; 4 partitions	Yes; 4 partitions
Language implemented in firmware	Partially	No	No	No	No
Operating system implemented in firmware	Partially	No	No	No	No
General accounting packages	Yes	No	No	No	No
Industry application areas	Business accounting	Business accounting	Business accounting	Business accounting	Business accounting
Data base management system	Yes	No	Yes	Yes	Yes
File access methods supported	Sequential, multi-key index seq.	Sequential, index sequential	Direct, sequential, index seq.	Direct, sequential, index seq.	Direct, sequential, index seq.
Software separately priced	No	No	No	No	No
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	NA	$12,500	$17,495	$28,850	$47,995
Monthly rental of basic system, $	NA*	Purchase only	Purchase only	Purchase only	Purchase only
Date of first U.S. delivery	NA	May 1975	July 1975	July 1975	July 1975
Number installed in U.S. to date	NA	NA	NA	NA	NA
COMMENTS				PDP-11/40-based system has higher performance level	PDP-11/40-based system has higher performance level

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

All About Small Business Computers

MANUFACTURER & MODEL	Digital Equipment Corp. Datasystem 530	Digital Equipment Corp. Datasystem 570	Digital Scientific Corporation Meta 4/1130	Digital Scientific Corporation Meta 4/VM2-TSO	Digital Scientific Corporation Meta 4/1800
DATA FORMATS					
Word length, bits	16	16	16 (+2 parity)	16 (+2 parity)	16 (+2 parity)
Decimal digits per word	2	2	5	5	5
Bytes (characters) per word	2	2	2	2	2
Operand length, words	½, 1, 2	½, 1, 2	1-2	1-2	1-2
Instruction length, words	1	1	1-2	1-2	1-2
CPU					
Model	DEC PDP-11/34	DEC PDP-11/70	DSC 4030	DSC 4031	DSC 4040
Add time, microseconds	7.3 (word)	2.7 (word)	2.9 (5 digits)	2.9 (5 digits)	2.9 (5 digits)
No. of programmable registers	7	10	5	5	5
No. of I/O ports on basic system and maximum	2, 10	—	4	4	4
INTERNAL STORAGE					
Type	Core	Core	Core	Core	Core
Capacity of basic system, bytes	64K	128K	16K	16K	16K
Maximum capacity, bytes	—	2048K	128K	128K	256K
Increment size, bytes	—	64K	16K	16K	16K
Cycle time, microseconds	0.980	0.980	0.9	0.9	0.9
Access time, microseconds	0.490	0.490	0.5	0.5	0.5
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	No	No	No
Cartridge disk drive	Std.; 19.2M bytes	Opt.; 19.2M bytes	Opt.; 5.12M bytes	Opt.; 5.12M bytes	Opt.; 5.12M bytes
Pack disk drive	Opt.; 704M bytes	Std.; 1200M bytes	Opt.; 160M bytes	Opt.; 160M bytes	Opt.; 160M bytes
Fixed-head disk/drum	No	Opt.; 8M bytes	No	Opt.; 1-2M bytes	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	No	No	No
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	No	Opt.; 400 cps	Opt.; 400 cps	Opt.; 400 cps
Paper tape punch	No	No	Opt.; 50 cps	Opt.; 50 cps	Opt.; 50 cps
Punched card reader	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 600, 1000	Opt.; 600, 1000	Opt.; 600, 1000
Punched card punch	No	No	Opt.; 35, 160 cpm	Opt.; 35, 160 cpm	Opt.; 35, 160 cpm
Punched card reader/punch	No	No	Opt.; 400/160 cpm	Opt.; 400/160 cpm	Opt.; 400/160 cpm
Serial printer	Std.; 30, 180 cps	Std.; 30, 180 cps	No	No	No
Line printer	Opt.; 60-1200 lpm	Opt.; 60-1200 lpm	Opt.;.300, 600 lpm	Opt.; 300,600 lpm	Opt.; 300, 600 lpm
Reel-to-reel tape drive	Opt.; 10-72 KBS	Opt.; 10-72 KBS	Opt.; 30, 60 KBS	Opt.; 30, 60 KBS	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	Optional; 12 x 80, 24 x 80 char.	Optional; 12 x 80, 24 x 80 char.	No	No	No
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	33	64	32	32	2
Synchronous	Opt.; to 50K 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.;50-19.2K bps	Opt.;50-19.2K bps	No
Protocols supported	IBM 2780, SDLC, DDCMP, etc.	IBM 2780, SDLC, DDCMP, etc.	IBM 2780/3780, BSC	IBM 2780/3780, BSC	IBM 2780/3780, BSC
SOFTWARE SUPPORT					
COBOL	Yes	Yes	Yes	Yes	No
RPG	Yes	Yes	Yes	Yes	No
FORTRAN	Yes	Yes	Yes	Yes	Yes
BASIC	Yes	Yes	No	Yes	No
Assembler	Yes	Yes	Yes, and macro	Yes, and macro	Yes, and macro
Other programming languages	DIBOL, DECform	DIBOL, DECform	None	APL, SI1	None
Multiprogramming	Yes; 32 partitions	Yes; 63 partitions	No	Yes; 32 partitions	Yes; 24 partitions
Language implemented in firmware	No	No	Partially	Partially	Partially
Operating system implemented in firmware	No	No	No	No	No
General accounting packages	No	No	Yes	Yes	No
Industry application areas	All business acctg. and data proc.	All business acctg. and data proc.	Mktg. research, civil eng., educ.	Mktg. research, civil eng., educ.	Med., process ctl., eng., research
Data base management system	No	DBMS-11	Yes	Yes	No
File access methods supported	Direct, sequential, index seq.	Direct, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index seq.
Software separately priced	Yes	Yes	Yes	Yes	No
Technical help separately priced	Yes	Yes	No	No	No
PRICING & AVAILABILITY					
Purchase price of basic system, $	$20,000	$105,000	$60,000	$100,000	$80,000
Monthly rental of basic system, $	NA	$4,200 (5-yr. lease)	$1,500	$2,300	$1,850
Date of first U.S. delivery	October 1976	NA	1970	1974	1971
Number installed in U.S. to date	NA	NA	Over 200	See Meta 4/1130	Over 30
COMMENTS	Replaces Datasystems based on PDP-11/40 and 11/45	High-speed controllers and dual-access disks avail.	Can run most IBM 1130/1800 programs; firmware arithmetic unit is optional	Can run most IBM 1130/1800 programs; firmware arithmetic unit is optional; timeshare, conversational operating system	Can run most IBM 1130/1800 programs; digital/analog I/O; real-time batch, timeshare OS

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

All About Small Business Computers

MANUFACTURER & MODEL	Digital Systems Galaxy/5 Model 120	Digital Systems Galaxy/5 Model 130	Digital Systems Galaxy/5 Model 140	Digital Systems Galaxy/5 Model 150	Dimis Inc. Total 100
DATA FORMATS					
Word length, bits	8	8	8	8	16
Decimal digits per word	1 per byte	1 per byte	1 per byte	1 per byte	4
Bytes (characters) per word	1 per byte	1 per byte	1 per byte	1 per byte	2
Operand length, words	1-256 bytes	1-256 bytes	1-256 bytes	1-256 bytes	4
Instruction length, words	2, 4, 6 bytes	2, 4, 6 bytes	2, 4, 6	2, 4, 6	1
CPU					
Model	Digital Systems	Digital Systems	Digital Systems	Digital Systems	Modcomp II
Add time, microseconds	20 (5 digits)	20 (5 digits)	20 (5 digits)	20 (5 digits)	0.8
No. of programmable registers	8	8	8	8	15
No. of I/O ports on basic system and maximum	3; 24	10; 40	20; 80	20; 80	2; 8
INTERNAL STORAGE					
Type	MOS	MOS	MOS	MOS	Core
Capacity of basic system, bytes	32K	64K	128K	256K	128K
Maximum capacity, bytes	32K	64K	128K	256K	128K
Increment size, bytes	None	None	None	None	None
Cycle time, microseconds	0.75	0.75	0.75	0.75	0.8
Access time, microseconds	0.50	0.50	0.50	0.50	0.5
MASS STORAGE CAPABILITIES*					
Floppy disk drive	See comments	See comments	See comments	See comments	Optional
Cartridge disk drive	See comments	See comments	See comments	See comments	Optional
Pack disk drive	Std.;32-240M byte	Std.;32-240M byte	Std.;32-240M byte	Std.;32-240M byte	Std.; 700M bytes
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	See comments	See comments	See comments	See comments	Standard
10-key numeric keyboard	See comments	See comments	See comments	See comments	Optional
Full accounting keyboard	No	No	No	No	Optional
INPUT/OUTPUT DEVICES*					
Paper tape reader	See comments	See comments	See comments	See comments	Optional
Paper tape punch	See comments	See comments	See comments	See comments	Optional
Punched card reader	See comments	See comments	See comments	See comments	Optional
Punched card punch	See comments	See comments	See comments	See comments	Optional
Punched card reader/punch	See comments	See comments	See comments	See comments	Optional
Serial printer	See comments	See comments	See comments	See comments	Optional
Line printer	Std.; 100-400 lpm	Std.; 100-400 lpm	Std.; 100-400 lpm	Std.; 100-400 lpm	Std.; 300 lpm
Reel-to-reel tape drive	No	No	No	No	Std.; 36 KBS
Cassette tape drive	See comments	See comments	See comments	See comments	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; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	24	40	80	120	32
Synchronous	Std.;to 15,000 bps	Std.;to 15,000 bps	Std.; to 15,000 bps	Std.;to 15,000 bps	Optional
Asynchronous	Std.; to 9600 bps	Std.; to 9600 bps	Std.; to 9600 bps	Std.; to 9600 bps	Std.; to 2400 bps
Protocols supported	Programmable	Programmable	Programmable	Programmable	None
SOFTWARE SUPPORT					
COBOL	No	No	No	No	No
RPG	Yes (late 1976)	Yes (late 1976)	Yes (late 1976)	Yes (late 1976)	No
FORTRAN	Yes (early 1977)	Yes (early 1977)	Yes (early 1977)	Yes (early 1977)	Yes
BASIC	No	No	No	No	No
Assembler	Yes	Yes	Yes	Yes	Yes
Other programming languages	None	None	None	None	None
Multiprogramming	Yes	Yes	Yes	Yes	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	—	—	—	—	Distribution
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.	Random, sequential, index seq.
Software separately priced	Yes	Yes	Yes	Yes	No
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$25,440 (CPU only)	$32,700 (CPU only)	$72,600 (CPU only)	$157,680 (CPU only)	$135,000
Monthly rental of basic system, $	$550 (CPU only)	$710 (CPU only)	$1,575 (CPU only)	$3,400 (CPU only)	NA
Date of first U.S. delivery	December 1975	December 1975	October 1976	October 1976	June 1974
Number installed in U.S. to date	2	4	NA	NA	3
COMMENTS	Nonstd. periph. are not sold by DSC but may be conn. thru comm. port; min. sys. costs $42,150; lease is 5-yr. full-payout with pur.	Nonstd. periph. are not sold by DSC but may be connected thru comm. port; lease is 5-yr. full-payout with purchase	Nonstd. periph. are not sold by DSC but may be conn. thru comm. port; lease is 5-yr. full-pay. w/purch.; typical system costs $137,750	Nonstd. periph. are not sold by DSC but may be connected thru comm. port; lease is 5-yr. full-payout with purchase	3 CRT's standard; package includes staff & mgmt. training & conversion support

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

All About Small Business Computers

MANUFACTURER & MODEL	Display Data Corporation In*sight	Educomp Corp. E-100	Educomp Corp. E-600	Financial Computer Fedder System III/10	Four-Phase Systems Inc. System IV/40
DATA FORMATS					
Word length, bits	8-bit byte	12	16	8-bit byte	24
Decimal digits per word	2	4	4	2 per byte	—
Bytes (characters) per word	1	2	2	1 per byte	3
Operand length, words	0-2	1	1, 2	1 byte	15 bits
Instruction length, words	1-4	1	1	1 byte	1
CPU					
Model	Microdata 1600/30	DEC PDP-8A	DEC PDP-11/34	Fedder S III	Four-Phase
Add time, microseconds	4.6	3.0	3.0	—	16 (word)
No. of programmable registers	6	6 + 8 in mem.	8	256	5
No. of I/O ports on basic system and maximum	2; 32	3; 7	4; 6	5; 64	34
INTERNAL STORAGE					
Type	Core	Core	Core	MOS	MOS
Capacity of basic system, bytes	32K	64K (6-bit)	32K	24K	24K
Maximum capacity, bytes	64K	64K (6-bit)	256K	256K	72K
Increment size, bytes	8K, 16K	None	32K	4, 8, 16, 32K	24K
Cycle time, microseconds	1.0	1.2, 1.5	0.9	—	2
Access time, microseconds	0.5	0.6, 0.75	0.45	—	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	Std.; 500K bytes	Optional	Opt.; 1M bytes	Opt.; 354K bytes
Cartridge disk drive	Std.; 40M bytes	Optional	Standard	Std.; 200M bytes	Std.; 10M bytes
Pack disk drive	No	Optional	Optional	No	No
Fixed-head disk/drum	No	Optional	Optional	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	No	Optional	Optional	Opt.; 300, 1000 cps	No
Paper tape punch	No	Optional	Optional	Opt.; 300, 1000 cps	No
Punched card reader	No	Optional	Optional	Opt.; 300, 600 cpm	Opt.; 300, 600 cpm
Punched card punch	No	Optional	Optional	Opt.; 300 cpm	No
Punched card reader/punch	No	Optional	Optional	No	No
Serial printer	Std.; 165 cps	Optional	Optional	Std.; 165 cps	Opt.; 30 cps
Line printer	Opt; 300, 600 lpm	Optional	Optional	Opt.; 300-1250 lpm	Opt.; 245-700 lpm
Reel-to-reel tape drive	Opt.; 36, 72 KBS	Optional	Optional	Opt.; 72 KBS	No
Cassette tape drive	No	Optional	Optional	Optional	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Standard; 24 x 80 char.	Optional; 24 x 80 char.	Optional; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	32	16	32	64	—
Synchronous	No	Optional	Optional	Opt.; to 9600 bps	Std.; to 9600 bps
Asynchronous	Std.; to 9600 bps	Standard	Standard	Std.; to 9600 bps	Opt.; to 2400 bps
Protocols supported	None	IBM 2780/3780, SDLC, etc.	IBM 2780/3780, SDLC, etc.	None	IBM 3270, 2780, 3780
SOFTWARE SUPPORT					
COBOL	No	Yes	Yes	No	No; comp. on IV/70
RPG	No	No	No	No	No; comp. on IV/70
FORTRAN	No	Yes	Yes	No	No
BASIC	No	Yes	Yes	Yes	No
Assembler	Yes	Yes	Yes	Yes	Yes
Other programming languages	None	FOCAL	FOCAL	CPL, PL/X	None
Multiprogramming	Yes; 6 partitions	Yes	Yes	Yes; 32 partitions	No
Language implemented in firmware	No	No	No	No	—
Operating system implemented in firmware	No	Partially	No	Partially	—
General accounting packages	Yes	No	Yes	Yes	No
Industry application areas	Auto dealers, CPA, whsl. dist.	Education, municipal government	Education, municipal government	Dist., manuf., construct., acctg.	Mfg., insurance, education
Data base management system	No	No	Yes	Yes	No
File access methods supported	Random, sequential	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index seq.	Contig., chained, seq., ran., ind.seq.
Software separately priced	Yes	Yes	Yes	Yes	No
Technical help separately priced	No	Yes	Yes	Yes	—
PRICING & AVAILABILITY					
Purchase price of basic system, $	$38,000	$6,000-$40,000	$45,000	$37,500	$30,315
Monthly rental of basic system, $	Purchase only	NA	NA	$750	$604
Date of first U.S. delivery	January 1974	1971	1972	January 1975	June 1973
Number installed	82	NA	NA	100+	2300+ (IV/40, 70)
COMMENTS		Complete administrative and instructional systems built to customer spec's.	Complete administrative and instructional systems built to customer spec's.	Can run interactive or batch in any partition; Fedder Data Systems is now a division of Financial Computer Corp.	4 CRT's & 2.5M-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.

All About Small Business Computers

MANUFACTURER & MODEL	Four-Phase Systems Inc. System IV/50	Four-Phase Systems Inc. System IV/70	General Automation DM-130/2	General Automation DM-130	General Automation DM-140
DATA FORMATS					
Word length, bits	24	24	16	16	16
Decimal digits per word	—	—	4	4	4
Bytes (characters) per word	3	3	2	2	2
Operand length, words	15 bits	15 bits	1, 2	1, 2	1, 2
Instruction length, words	1	1	1	1	1
CPU					
Model	Four-Phase	Four-Phase	GA SPC-16/40	GA SPC-16/45	GA SPC-16/65
Add time, microseconds	16 (word)	16 (word)	1.44	0.96	0.96
No. of programmable registers	5	5	16	16	16
No. of I/O ports on basic system and maximum	29	78	8	18	18
INTERNAL STORAGE					
Type	MOS	MOS	Core	Core	Core
Capacity of basic system, bytes	24K	24K	64K	64K	80K
Maximum capacity, bytes	96K	96K	64K	64K	128K
Increment size, bytes	12K, 24K	12K, 24K	—	—	4K
Cycle time, microseconds	2	2	1.44	0.96	0.96
Access time, microseconds	—	—	0.72	0.48	0.48
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Std.; 354K bytes	Opt.; 354K bytes	No	No	No
Cartridge disk drives	Std.; 10M bytes	Std.; 10M bytes	Std.; 10M bytes	Std.; 40M bytes	Std.; 40M bytes
Pack disk drive	Opt.; 270M bytes	Opt.; 270M bytes	No	Opt.; 200M bytes	Opt.; 200M bytes
Fixed-head disk/drum	No	No	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.; 300, 600 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	Opt.; 30 cps	Std.; 165 cps	Std.; 165 cps	Std.(2); 165 cps
Line printer	Opt.; 245-700 lpm	Opt.; 245-700 lpm	No	Std.; 200-600 lpm	Std.(2); to 600 lpm
Reel-to-reel tape drive	No	Std.; 10, 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; 24 x 80 char.	Standard; 6 x 48 char.	Standard (2); 24 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	—	—	5	5	25
Synchronous	Std.; to 9600 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 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Protocols supported	IBM 3270, 2780, 3780, bisync	IBM 3270, 2260, 2780, 3780	IBM HASP, 2780	IBM HASP, 2780	IBM HASP, 2780
SOFTWARE SUPPORT					
COBOL	Yes	Yes	No	No	No
RPG	No	Yes	No	No	No
FORTRAN	No	No	Yes	Yes	Yes
BASIC	No	No	No	No	No
Assembler	Yes	Yes	Yes	Yes	Yes
Other programming languages	None	None	None	None	None
Multiprogramming	No	No	Yes; 4 partitions	Yes; 4 partitions	Yes; 2 partitions
Language implemented in firmware	—	—	No	No	No
Operating system implemented in firmware	—	—	No	No	No
General accounting packages	No	No	Yes	Yes	Yes
Industry application areas	Mfg., insurance, education	Mfg., insurance, education	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. rand., ind. seq.	Contig., chained, seq., rand., ind. seq.	Index sequential	Index sequential	Index sequential
Software separately priced	No	No	No	No	No
Technical help separately priced	—	—	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	—	$68,055	$35,000	$35,000	$55,000
Monthly rental of basic system, $	$1,335 (42-mo. lease)	$1,432	Purchase only	Purchase only	Purchase only
Date of first U.S. delivery	4th quarter 1976	February 1971	January 1974	November 1974	June 1975
Number installed in U.S. to date	NA	2300+ (IV/40,70)	NA	NA	NA
COMMENTS	12 CRT's and 10M-byte cartridge disk are standard; applications in data entry and network transaction processing	12 CRT's and 2.5M-byte cartridge disk are standard; applications in data entry and network transaction processing	Sold as a turnkey system by OEM's		

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

All About Small Business Computers

MANUFACTURER & MODEL	General Information Systems GIS-350 ABLE	General Robotics GRC-11/03	General Robotics TSS/11	GRI Computer System 99	Harris 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, 2	1	1	—	1, 2
Instruction length, words	1	1-3	1-3	1-3	1
CPU					
Model	DEC PDP-11/34	DEC PDP-11/03	DEC PDP-11/34	GRI 99/50	Harris Slash 4
Add time, microseconds	3	3.17	1.14	—	0.75 (8 bits)
No. of programmable registers	8	8	8	13	5
No. of I/O ports on basic system and maximum	4; 6	2; 16	5; 64	4; 9	12; 12
INTERNAL STORAGE					
Type	Core, MOS	MOS	Core, MOS	Core	Core, bipolar
Capacity of basic system, bytes	32K	24K	120K	32K	96K
Maximum capacity, bytes	256K	1016K	248K	64K	768K
Increment size, bytes	32K	16K	16K	16K	24K, 48K
Cycle time, microseconds	1	0.72	0.98	1.76	0.750, 0.200
Access time, microseconds	0.51	0.5	0.75	—	0.300, —
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	Std.; 2.4M bytes	Opt.; 2.4M bytes	No	Opt.; 310K bytes
Cartridge disk drive	Std.; 38.4M bytes	Opt.; 10M bytes	Std.; 10M bytes	Std.; 42.4M bytes	Std.; 21.6 M bytes
Pack disk drive	Opt.; 160M bytes	Opt.; 200M bytes	Opt.; 200M bytes	No	No
Fixed-head disk/drum	No	No	No	No	Opt.; 10.5M bytes
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Optional	Optional	Standard	No
Full accounting keyboard	Standard	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 300 cps	Opt.; 300 cps	Opt.; 300 cps	No	Opt.; 300 cps
Paper tape punch	Opt.; 50 cps	Opt.; 50 cps	Opt.; 50 cps	No	Opt.; 75 cps
Punched card reader	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 1000 cpm
Punched card punch	No	Optional	Optional	No	No
Punched card reader/punch	No	Optional	Optional	Opt.; 300/120 cpm	Opt.;500/100 cpm
Serial printer	Std.; 180 cps	No	No	Std.; 88-330 cps	Opt.; 30 cps
Line printer	Opt.; 300 lpm	Std.; 65-340 lpm	Std.; 100-340 lpm	Opt.; 200-600 lpm	Opt.; 300-900 lpm
Reel-to-reel tape drive	Opt.; 72 KBS	Optional	Optional	Opt.; 60 KBS	Std.; 36 KBS
Cassette tape drive	No	Optional	Optional	No	Opt.; 30 cps
Cartridge tape drive	No	Optional	Optional	Optional	No
Magnetic ledger card devices	No	No	No	No	No
CRT	Standard; 24 x 76 char.	Standard; 24 x 80 char.	Standard (4); 24 x 80 char.	Standard; 8 x 80 or 16 x 80 char.	Standard; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	16	Unlimited	Unlimited	—	128
Synchronous	No	No	Std.; to 40M bps	Opt.; to 1200 bps	Opt.; to 98K bps
Asynchronous	Opt.; to 9600 bps	Standard	Std.; to 40M bps	Opt.; to 1200 bps	Opt.; to 19.2K bps
Protocols supported	IBM 2780	None	IBM 2780	None	2780/3780 bisync, HASP, CDC 200
SOFTWARE SUPPORT					
COBOL	Yes	No	Yes	Yes	Yes
RPG	No	No	Yes	RPG II	Yes
FORTRAN	Yes	Yes	Yes	No	Yes
BASIC	Yes	Yes	Yes	No	Yes
Assembler	Yes	Yes	Yes	Yes	Yes
Other programming languages	DIBOL	FOCAL	APL, FOCAL	None	SNOBOL 4, FORGO
Multiprogramming	Yes; 16 partitions	Yes; 8 partitions	Yes; 24 partitions	Yes	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's, mun. gov't., trucking, dist.	Engineering	Engineering	Manufacturing, distribution	No
Data base management system	Yes	Yes	Yes	No	Yes
File access methods supported	Random, indexed sequential	Random, sequential	Random, sequential	Random, sequential, index seq.	Yes
Software separately priced	Yes	No	No	Some	No
Technical help separately priced	Yes	No	No	Yes	No
PRICING & AVAILABILITY					
Purchase price of basic system, $	$45,000	$13,975	$59,750	$44,376	$85,000
Monthly rental of basic system, $	$925	Purchase only	Purchase only	Purchase only	Purchase only
Date of first U.S. delivery	January 1976	July 1976	December 1975	NA	3rd quarter 1975
Number installed in U.S. to date	4	10	7	NA	NA
COMMENTS	Turnkey system; software available separately for $12,500			Interactive, multi-user system	

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

All About Small Business Computers

MANUFACTURER & MODEL	Harris S120	Harris S210	Harris S220	Hewlett-Packard Calculator Products Division 9830A	Hewlett-Packard Calculator Products Division 9830B
DATA FORMATS					
Word length, bits	24	24	24	8-bit byte	8-bit byte
Decimal digits per word	6	6	6	1 per byte	1 per byte
Bytes (characters) per word	3	3	3	1 per byte	1 per byte
Operand length, words	1, 2	1, 2	1, 2	—	—
Instruction length, words	1	1	1	2 bytes	2 bytes
CPU					
Model	Harris Slash 4	Harris Slash 7	Harris Slash 7	HP 9830A	HP 9830B
Add time, microseconds	0.75 (8 bits)	0.40 (8 bits)	0.40 (8 bits)	1000 (approx.)	1000 (approx.)
No. of programmable registers	5	5	5	See comments	See comments
No. of I/O ports on basic system and maximum	12; 12	12; 12	12; 12	5; 13	5; 13
INTERNAL STORAGE					
Type	Core, bipolar	Core, bipolar	Core, bipolar	MOS	MOS
Capacity of basic system, bytes	144K	192K	288K	3520	15,808
Maximum capacity, bytes	768K	768K	768K	15,808	30,144
Increment size, bytes	24K, 48K	48K	48K	4, 8K	14, 336
Cycle time, microseconds	0.750, 0.200	0.425, 0.200	0.425, 0.200	13	13
Access time, microseconds	0.300, —	0.300, —	0.300, —	—	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Opt.; 310K bytes	Opt.; 310K bytes	Opt.; 310K bytes	No	No
Cartridge disk drive	Std.; 21.6M bytes	Opt.; 21.6M bytes	Opt.; 21.6M bytes	Opt.; 4.8M bytes	Opt.; 4.8M bytes
Pack disk drive	No	Std.; 80M bytes	Std.; 80M bytes	No	No
Fixed-head disk/drum	Opt.; 10.5M bytes	Opt.; 10.5M bytes	Opt.; 10.5M bytes	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	No	No	No	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 300 cps	Opt.; 300 cps	Opt.; 300 cps	Opt.; 20 cps	Opt.; 20 cps
Paper tape punch	Opt.; 75 cps	Opt.; 75 cps	Opt.; 75 cps	No	No
Punched card reader	Std.; 300 cpm	Std.; 300 cpm	Std.; 600 cpm	Opt.; 300 cpm	Opt.; 300 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	No	No
Serial printer	Opt.; 30 cps	Opt.; 30 cps	Opt.; 30 cps	No	No
Line printer	Std.; 300 lpm	Std.; 300 lpm	Std.; 600 lpm	Std.; 250, 300 lpm	Opt.; 250, 300 lpm
Reel-to-reel tape drive	Std.; 36 KBS	Std.; 36 KBS	Std.; 36 KBS	No	No
Cassette tape drive	Opt.; 30 cps	Opt.; 30 cps	Opt.; 30 cps	Std.; 375 bps	Std.; 375 bps
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.	Optional; 24 x 80 char.	Optional; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	128	128	128	1	1
Synchronous	Opt.; to 98K bps	Opt.; to 98K bps	Opt.; to 96K bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Asynchronous	Opt.; to 19.2K bps	Opt.; to 19.2K bps	Opt.; to 19.2K bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Protocols supported	2780/3780 bisync, HASP, CDC 200, etc.	2780/3780 bisync, HASP, CDC 200, etc.	2780/3780 bisync, HASP, CDC 200, etc.	None	None
SOFTWARE SUPPORTED					
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	Yes	Yes	Yes	No	No
Other programming languages	SNOBOL, FORGO	SNOBOL, FORGO	SNOBOL, FORGO	None	None
Multiprogramming	Yes; 256 partitions	Yes; 256 partitions	Yes; 256 partitions	No	No
Language implemented in firmware	No	No	No	Fully	Fully
Operating system implemented in firmware	No	No	No	Fully	Fully
General accounting packages	No	No	No	Yes	Yes
Industry application areas	No	No	No	Real estate, medical, engineering	Real estate, medical, engineering
Data base management system	Yes	Yes	Yes	No	No
File access methods supported	Yes	Yes	Yes	None	None
Software separately priced	No	No	No	Yes	Yes
Technical help separately priced	No	No	No	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$119,000	$149,000	$189,000	$4,900	$8,350
Monthly rental of basic system, $	Purchase only	Purchase only	Purchase only	NA	NA
Date of first U.S. delivery	3rd quarter 1975	4th quarter 1975	4th quarter 1975	November 1972	May 1976
Number installed in U.S. to date	NA	3	1	NA	NA
COMMENTS				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.

All About Small Business Computers

MANUFACTURER & MODEL	Hewlett-Packard Data Systems Div. 2105A	Hewlett-Packard Data Systems Div. 2112A	Hewlett-Packard Data Systems Div. 9640A	Hewlett-Packard Data Systems Div. 9700A	Hewlett-Packard General Sys. Div. 2000 Model 30
DATA FORMATS					
Word length, bits	16	16	16	16	16
Decimal digits per word	4	4	2	2	4
Bytes (characters) per word	2	2	2	2	2
Operand length, words	1-3	1-3	½, 1, 2	½, 1, 2	1, 2
Instruction length, words	1-3	1-3	1, 2	1,2	1
CPU					
Model	HP 2105A	HP 2112A	HP 21MX	HP 21MX	HP 2108A (M/20)
Add time, microseconds	1.94 (5 digits)	1.94 (5 digits)	1.94 (word)	1.94 (word)	1.94 (5 digits)
No. of programmable registers	5	5	7	7	20
No. of I/O ports on basic system and maximum	4; 36	14; 46	9; 46	9; 46	25
INTERNAL STORAGE					
Type	MOS	MOS	MOS	MOS	MOS
Capacity of basic system, bytes	4K	4K	32K	64K	96K
Maximum capacity, bytes	—	512K	608K	608K	128K
Increment size, bytes	8, 16, 32K	8, 16, 32K	16K, 32K	16K, 32K	16K
Cycle time, microseconds	0.65	0.65	0.650	0.650	0.650
Access time, microseconds	0.40	0.40	—	—	0.400
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	No	No	No
Cartridge disk drive	Opt.; 120M bytes	Opt.; 120M bytes	Opt.; 118M bytes	Std.; 118M bytes	Opt.; 120M bytes
Pack disk drive	No	No	No	No	No
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Optional	Optional	Standard	Standard	Standard
10-key numeric keyboard	Optional	Optional	Optional	Optional	No
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 500 cps	Opt.; 500 cps	Std.; 500 cps	Std.; 500 cps	Std.; 500 cps
Paper tape punch	Opt.; 75 cps	Opt.; 75 cps	Opt.; 75 cps	Opt.; 75 cps	Opt.; 75 cps
Punched card reader	Opt.;300, 600 cpm	Opt.;300,600 cpm	Opt.; 600 cpm	Opt.; 600 cpm	Opt.; 600 cpm
Punched card punch	Opt.; 75 cpm	Opt.; 75 cpm	No	No	No
Punched card reader/punch	Opt.; 200/75 cpm	Opt.; 200/75 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	Opt.;200-1250 lpm	Opt.;200-1250 lpm	Opt.;200-1250 lpm	Opt.;200-1250 lpm	Opt.;200-1250cpm
Reel-to-reel tape drive	Opt.; 36 KBS	Opt.; 36 KBS	Opt.; 20-72 KBS	Opt.; 20-72 KBS	Std.; 72 KBS
Cassette tape drive	No	No	Opt.; 1 KBS	Opt.; 1 KBS	Opt.; 240 cps
Cartridge tape drive	Opt.; 1000 cps	Opt.; 1000 cps	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.	Optional; 24 x 80 char.	Optional; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	32	32	16	16	32
Synchronous	No	Opt.; to 9600 bps	Opt.; to 125 KBS	Opt.; to 125 KBS	Opt.; to 4800 bps
Asynchronous	Opt.; to 2400 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 2400 bps
Protocols supported	HPIB (IEEE-488)	IBM 2780/3780, HASP, ASP	IBM 2780, bisync	IBM 2780, bisync	IBM HASP, bisync, CDC U200
SOFTWARE SUPPORT					
COBOL	No	No	No	No	No
RPG	No	No	No	No	No
FORTRAN	Yes	Yes	Yes	Yes	No
BASIC	Yes	Yes	Yes	Yes	Yes
Assembler	Yes	Yes	Yes	Yes	No
Other programming languages	ALGOL, Micro	ALGOL, Micro	ALGOL	ALGOL	None
Multigramming	No	Yes; 64 partitions	Yes; 16 partitions	Yes; 16 partitions	Yes
Language implemented in firmware	Partially	Partially	Partially	Partially	No
Operating system implemented in firmware	Partially	Partially	No	No	Partially
General accounting packages	No	No	No	No	No
Industry application areas	Manufacturing, scientific	Manufacturing, scientific	Mat'l. req. plan, inv.ctl., order ent.	Mat'l. req. plan, inv. ctl., order ent.	Manufacturing, education
Data base management system	No	Yes	IMAGE 1000	IMAGE 1000	No
File access methods supported	—	Random, sequential, limited, keyed	Random, sequential, keyed	Random, sequential, keyed	Sequential
Software separately priced	Yes	Yes	Some	Some	Some
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$5,750	$7,700	$30,000	$39,850	$67,000
Monthly rental of basic system, $	NA	NA	$780 (5-yr. lease)	$1,036 (5-yr. lease)	$1,424
Date of first U.S. delivery	May 1974	September 1975	1972	March 1973	1969
Number installed in U.S. to date	3,550 (2100 Series)	3,550 (2100 Series)	800	100	7,640 (2000 Series)
COMMENTS	Processor is sold alone or packaged for inventory management, distributed processing or order processing	Processor is sold alone or packaged for inventory management, distributed processing, or order processing		Includes hardware and software to permit communication with up to 16 satellite systems	Powerful security system for time-sharing environment

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

All About Small Business Computers

MANUFACTURER & MODEL	Hewlett-Packard General Sys. Div. 2000 Model 40	Hewlett-Packard General Sys. Div. 3000/II Model 5	Hewlett-Packard General Sys. Div. 3000/II Model 7	Hewlett-Packard General Sys. Div. 3000/II Model 9	Honeywell 6/06
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	1, 2	1, 2, 4	1, 2, 4	1, 2, 4	½, 1, 2
Instruction length, words	1	½, 1	½, 1	½, 1	1, 2
CPU					
Model	HP 2108A (M/20)	HP 3000	HP 3000	HP 3000	Honeywell 6/06
Add time, microseconds	1.94 (5 digits)	1.225 (10 digits)	1.225 (10 digits)	1.225 (10 digits)	2 (words)
No. of programmable registers	20	20	20	20	7
No. of I/O ports on basic system and maximum	25	15	13	14	64
INTERNAL STORAGE					
Type	MOS	MOS	MOS	MOS	MOS
Capacity of basic system, bytes	128K	128K	192K	320K	16K
Maximum capacity, bytes	128K	256K	256K	512K	128K
Increment size, bytes	None	64K	64K	64K	16K
Cycle time, microseconds	0.650	0.70	0.70	0.70	0.650
Access time, microseconds	0.400	0.35	0.35	0.35	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	No	No	No
Cartridge disk drive	Opt.; 120M bytes	Std.; 60M bytes	Opt.; 60M bytes	Opt.; 60M bytes	Opt.; 40M bytes
Pack disk drive	No	Opt.; 376M bytes	Opt.; 376M bytes	Std.; 376M bytes	Opt.; 60M bytes
Fixed-head disk/drum	No	No	No	No	Opt.; 1M bytes
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Optional
10-key numeric keyboard	No	Standard	Standard	Standard	Optional
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Std.; 500 cps	Opt.; 500 cps	Opt.; 500 cps	Opt.; 500 cps	Opt.; 300 cps
Paper tape punch	Opt.; 75 cps	Opt.; 75 cps	Opt.; 75 cps	Opt.; 75 cps	Opt.; 110 cps
Punched card reader	Opt.; 600 cpm	Opt.; 600 cpm	Opt.; 600 cpm	Opt.; 600 cpm	Opt.;300-1000 cpm
Punched card punch	No	No	No	No	Opt.; 100-400 cpm
Punched card reader/punch	No	Opt.; 200/75 cpm	Opt.; 200/75 cpm	Opt.; 200/75 cpm	Opt.; 400/100 cpm
Serial printer	Opt.; 10-120 cps	Opt.; 30-120 cps	Opt.; 30-120 cps	Opt.; 30-120 cps	Opt.; 165 cps
Line printer	Opt.;200-1250 cpm	Opt.;200-1250 lpm	Opt.;200-1250 lpm	Opt.;200-1250 lpm	Opt.;240-1100 lpm
Reel-to-reel tape drive	Std.; 72 KBS	Std.; 72 KBS	Std.; 72 KBS	Std.; 72 KBS	Opt.; 5.2-20 KBS
Cassette tape drive	Opt.; 240 cps	Opt.; 240 cps	Opt.; 240 cps	Opt.; 240 cps	Opt.; 700 cps
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.	Optional; 24 x 80 char.	Optional; 12 x 80, 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	32	31	31	63	128
Synchronous	Opt.; to 4800 bps	Opt.; to 4800 bps	Opt.; to 4800 bps	Opt.; to 4800 bps	Opt.; to 100K bps
Asynchronous	Opt.; to 2400 bps	Opt.; to 2400 bps	Opt.; to 2400 bps	Opt.; to 2400 bps	Opt.; to 9600 bps
Protocols supported	IBM HASP, bisync, CDC U200	IBM 2780/3780	IBM 2780/3780	IBM 2780/3780	None
SOFTWARE SUPPORT					
COBOL	No	Yes	Yes	Yes	No
RPG	No	Yes	Yes	Yes	No
FORTRAN	No	Yes	Yes	Yes	Yes
BASIC	Yes	Yes	Yes	Yes	Yes
Assembler	No	Yes	Yes	Yes	Macro assembler
Other programming languages	None	None	None	None	None
Multiprogramming	Yes	Yes	Yes	Yes	Yes
Language implemented in firmware	No	Partially	Partially	Partially	No
Operating system implemented in firmware	Partially	Partially	Partially	Partially	No
General accounting packages	No	No	No	No	No
Industry application areas	Manufacturing, education	Manufacturing, education	Manufacturing, education	Manufacturing, education	Hospital, manuf., inventory, medical
Data base management system	No	Yes	Yes	Yes	No
File access methods supported	Sequential	Direct, sequential, chained	Direct, sequential, chained	Direct, sequential, chained	Random, sequential, index seq.
Software separately priced	Some	Some	Some	No	Yes
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$75,200	$110,000	$150,000	$190,000	$7,900
Monthly rental of basic system, $	$1,598	$2,338 (5-yr. lease)	$3,188 (5-yr. lease)	$4,038 (5-yr. lease)	NA
Date of first U.S. delivery	1969	June 1976	June 1976	June 1976	January 1976
Number installed in U.S. to date	7,640 (2000 Series)	225 (3000 Series)	225 (3000 Series)	225 (3000 Series)	10
COMMENTS	Powerful security system for time-sharing environment	3000 Series II is upgrade from previous 3000CX Series	3000 Series II is upgrade from previous 3000CX Series	3000 Series II is upgrade from previous 3000CX Series	Microprogrammed to emulate the Honeywell 716 CPU

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

All About Small Business Computers

MANUFACTURER & MODEL	Honeywell 61/58	Honeywell 61/60	Honeywell 62/40	Honeywell 62/60	Hotel Computers, Inc.
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	2 per byte	2 per byte	2 per byte	4
Bytes (characters) per word	1 per byte	1 per byte	1 per byte	1 per byte	2
Operand length, words	2 bytes	2 bytes	2 bytes	2 bytes	1, 2
Instruction length, words	1-8 bytes	1-8 bytes	2-8 bytes	2-8 bytes	1, 2
CPU					
Model	Honeywell 61/58	Honeywell 61/60	Honeywell 62/40	Honeywell 62/60	Varian V72
Add time, microseconds	115 (9 digits)	115 (9 digits)	—	—	7.0 (1 word)
No. of programmable registers	100	100	29	29	3
No. of I/O ports on basic system and maximum	4	4	6	6	10, 32
INTERNAL STORAGE					
Type	Core	MOS	MOS	MOS	Core
Capacity of basic system, bytes	5K	10K	64K	64K	64K
Maximum capacity, bytes	10K	10K	128K	256K	512K
Increment size, bytes	5K	None	8, 16K	16K	64K
Cycle time, microseconds	1.2	1.2	1 (2 bytes)	1 (2 bytes)	0.660
Access time, microseconds	—	—	—	—	0.330
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	No	No	No
Cartridge disk drive	Opt.; 23M bytes	Opt.; 23M bytes	Opt.; 46.4M bytes	Opt.; 46.4M bytes	Std.; 5M bytes
Pack disk drive	Opt.; 92M bytes	Opt.; 92M bytes	Opt.; 160M bytes	Opt.; 480M bytes	No
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Optional	Optional	Standard	Standard	Standard
10-key numeric keyboard	Optional	Optional	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.; 100-300 cpm	Opt.; 100-300 cpm	Opt.; 300-1050 cpm	Opt.;300-1050 cpm	No
Punched card punch	Opt.; 30-300 cpm	Opt.; 30-300 cpm	Opt.; 100-400 cpm	Opt.; 100-400 cpm	No
Punched card reader/punch	No	No	Opt.; 500-1000 cpm	Opt.; 500-1000 cpm	No
Serial printer	No	No	Std.; 30 cps	Std.; 30 cps	Std.; 165 cps
Line printer	Opt.; 100-650 lpm	Opt.; 100-650 lpm	Opt.;400-1600 lpm	Opt.;400-1600 lpm	Opt.; 300 lpm
Reel-to-reel tape drive	No	No	Opt.; 10.4-60 KBS	Opt.; 10.4-60 KBS	No
Cassette tape drive	No	No	Std.; 700 bps	Std.; 700 bps	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	See comments	See comments	See comments	See comments	Standard; 27 x 74 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	4	17	9	9	1
Synchronous	Opt.; to 9600 bps	Opt.; to 4800 bps	Std.; to 9600 bps	Std.; to 9600 bps	Opt.
Asynchronous	Opt.; to 2400 bps	Opt.; to 2400 bps	Std.; to 9600 bps	Std.; to 9600 bps	Opt.
Protocols supported	None	None	None	None	None
SOFTWARE					
COBOL	Yes	Yes	Yes	Yes	No
RPG	No	No	Yes	Yes	RPG II
FORTRAN	No	No	Yes	Yes	FORTRAN IV
BASIC	No	Yes	No	No	No
Assembler	No	No	No	No	Yes
Other programming languages	None	None	None	None	None
Multiprogramming	Yes; 17 partitions	Yes; 17 partitions	Yes	Yes	Yes; multi. F; 1B
Language implemented in firmware	No	No	No	No	No
Operating sytem implemented in firmware	No	No	No	No	No
General accounting packges	Yes	Yes	Yes	Yes	Yes
Industry application areas	Educ., hospital, manuf., inventory	Educ., hospital, manuf., inventory	Distribution, manufacturing	Distribution, manufacturing	Hotels
Data base management system	No	No	No	No	No
File access methods supported	Indexed random	Indexed random	Direct, sequential, index seq.	Direct, sequential, index seq.	Random, sequential, index seq.
Software separately priced	Yes	Yes	Yes	Yes	No
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$20,600	$25,380	$51,950	$75,410	$125,000
Monthly rental of basic sytem, $	$418	$611	$1,107	$1,697	Purchase only
Date of first U.S. delivery	November 1974	2nd quarter 1975	June 1975	June 1974	2nd quarter 1973
Number installed in U.S. to date	90 (Level 61)	90 (Level 61)	600+ (Level 62)	600+ (Level 62)	10
COMMENTS	Ext. mem. (312K bps) or 8-64K is avail.; Hazeltine, GE, & other terminals can be interfaced; see Report 70C-480-14 for details	Ext. mem. (312K bps) of 8-64K is avail.; Hazeltine, GE, & other terminals can be interfaced; see Report 70C-480-14 for details	Hazeltine, GE, & other terminals can be interfaced; see Report 70C-480-13 for more details	Hazeltine, GE, & other terminals can be interfaced; see Report 70C-480-13 for more details	Complete turnkey system for hotel usage; interfaces for hotel switchboard and in-room vending devices available

*"Std." means the price of the "basic system" as listed here.

All About Small Business Computers

MANUFACTURER & MODEL	IBM 5100	IBM System/32	IBM System/3	IBM 1130	IBM System/360 Model 20
DATA FORMATS					
Word length, bits	8-bit byte	8-bit byte	8-bit byte	16	8-bit byte
Decimal digits per word	1 per byte	1 per byte	1 per byte	2	2 per byte
Bytes (characters) per word	1 per byte	1 per byte	1 per byte	2	1 per byte
Operand length, words	—	1-16 digits	1-16 digits	1, 2	1-16 digits
Instruction length, words	2 bytes	3-6 bytes	4-6 bytes	1, 2	2, 4, 6 bytes
CPU					
Model	IBM 5100	IBM System/32	IBM System/3	IBM 1130	IBM 360/20
Add time, microseconds	1000 (approx.)	150 (5 digits)	24 (5 digits)	4.9; 8.0	209 (5 digits)
No. of programmable registers	Software-assigned	4	—	3	8
No. of I/O ports on basic system and maximum	2; variable	—	—	—	—
INTERNAL STORAGE					
Type	MOS	MOS	Core, MOS	Core	Core
Capacity of basic system, bytes	16K	16K	8K	8K	4K
Maximum capacity, bytes	64K	32K	256K	64K	32K
Increment size, bytes	16K	8K	4, 8, 16, 32K	8K	4K
Cycle time, microseconds	0.530 (2 bytes)	0.6	1.52	2.2; 3.6	See comments
Access time, microseconds	0.330	0.250	—	—	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	Std.; 303K bytes	Opt.; via 3741	No	No
Cartridge disk drive	No	See comments	Opt.; 9.8M bytes	Std.; 5.12M bytes	No
Pack disk drive	No	No	Opt.; 506M bytes	Opt.; 5.12M bytes	Opt.; 21.6M bytes
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Optional	Standard	Optional
10-key numeric keyboard	Standard	Standard	Optional	No	No
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	No	No	Opt.; 60 cps	No
Paper tape punch	No	No	No	Opt.; 14.8 cps	No
Punched card reader	No	No	Opt.;600,1000 cpm	Opt.; 100, 600 cpm	Opt.;600,1000 cpm
Punched card punch	No	No	No	Opt.; 120 cpm	Opt.; 300, 500 cpm
Punched card reader/punch	No	Opt.;50/12-50 cpm	Opt.; 250/60 cpm	Opt.; 300/60 cpm	Opt.; 310/90 cpm
Serial printer	Opt.; 80 cps	Std.; 40, 80 cps	Opt.; 85 cps	Std.; 15 cps	Opt.; 15.5 cps
Line printer	No	Std.; 50-155 lpm	Opt.; 100-1100 lpm	Opt.; 40-1100 lpm	Opt.; 260-1100 lpm
Reel-to-reel tape drive	No	No	Opt.; 20-80 KBS	Opt.; 15 KBS	Opt.; 150-60 KBS
Cassette tape drive	No	No	No	No	No
Cartridge tape drive	Std.; 2850 cps	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Standard; 16 x 64 char.	Standard; 6 x 40 char.	Opt.; 12 x 40, 12 x 80, 24 x 80 char.	Optional; 52 x 74 char.	No
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	1	1	8	16	1
Synchronous	No	Opt.; to 7200 bps	Opt.; to 50K bps	Opt.; to 4800 bps	Opt.; to 50K bps
Asynchronous	Opt.; to 300 bps	No	No	No	No
Protocols supported	IBM 2741	IBM SDLC	IBM SDLC	Bisync	Bisync
SOFTWARE					
COBOL	No	No	Yes	No	No
RPG	No	RPG II	RPG II	Yes	Yes
FORTRAN	No	No	Yes	Yes	No
BASIC	Yes	No	Yes	No	No
Assembler	No	Macro assembler	No	Yes and macro	Yes and macro
Other programming languages	APL	None	None	None	PL/I
Multiprogramming	No	No	Yes; 3 partitions	No	No
Language implemented in firmware	Fully	No	No	No	No
Operating system implemented in firmware	Fully	Partially	No	No	No
General accounting packages	No	Yes	Yes	Yes	Yes
Industry application areas	Financial analysis, statistics	Dist., medical, manuf., word proc.	Dist., medical, manuf., educ.	Engin., manuf., dist., medical	Manuf., dist., educ., gov't.
Data base management system	No	No	No	No	No
File access methods supported	Sequential	Random, sequential, index seq.	—	Random, sequential, index seq.	Random, sequential, index seq.
Software separately priced	Some	Yes	Yes	Yes	Yes
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$8,975	$33,560	$22,430	$18,910	$13,040
Monthly rental of basic system, $	$450 (3-mo. lease)	$680 (3-yr. lease)	$674	$826	$529
Date of first U.S. delivery	September 1975	February 1975	December 1970	1965	November 1964
Number installed in U.S. to date	NA	5,500+	30,000+	4,000	15,000
COMMENTS	Portable computer weighing 50 lbs.; RS-232C interface available for non-IBM peripherals	System also incl. 3.2M-13.75M bytes of nonremovable disk storage; approx. 10,000 more System/32's are on order; see Report 70C-491-25	Six different models currently in line; see Report 70C-491-21 for more details	Also available without std. disk for as little as $14,150; cycle times vary with processor model; see Report 70C-491-11 for more details	Low end of IBM's 360 Series; cycle times vary with processor model; see Report 70C-491-02 for more details

*"Std." means the price of the "basic system" as listed here.

All About Small Business Computers

MANUFACTURER & MODEL	Information Associates Inc. TIS	Interdata IBIS 500	Interdata IBIS 600	Interdata IBIS 700	Interdata IBIS 800
DATA FORMATS					
Word length, bits	16	16	16	32	32
Decimal digits per word	4	2	2	4	4
Bytes (characters) per word	2, 3	2	2	4	4
Operand length, words	½	1	1	1	1
Instruction length, words	1	1, 2	1, 2	½, 1, 1½	½, 1, 1½
CPU					
Model	DG Nova 830	Interdata 5/16	Interdata 6/16	Interdata 7/32	Interdata 8/32
Add time, microseconds	1	1.2 (1 word)	3.0 (1 word)	3.25 (1 word)	1.25 (1 word)
No. of programmable registers	4	16	16	2 sets of 16	2-8 sets of 16
No. of I/O ports on basic sytem and maximum	60	4, 255	4, 255	4, 1023	4, 1023
INTERNAL STORAGE					
Type	Core	MOS	Core, MOS	Core	Core
Capacity of basic system, bytes	32K	8K	8K	128K	128K
Maximum capacity, bytes	256K	64K	64K	1024K	1024K
Increment size, bytes	32K	8K, 16K, 32K	8K, 16K, 32K	8K, 16K, 32K	128K
Cycle time, microseconds	1.0	0.600	1.0, 0.600	1.0, 0.750	0.750
Access time, microseconds	0.5	0.300	0.500, 0.300	0.500, 0.375	0.375
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Optional	Std.;2 x 300K bytes	Opt.;2 x 300K bytes	Opt.;2 x 300K bytes	Opt.;2 x 300K bytes
Cartridge disk drive	Std.; 40M bytes	No	Std.; 40M bytes	Std.; 40M bytes	Std.; 40M bytes
Pack disk drive	Opt.; 1200M bytes	No	Opt.; 1200M bytes	Opt.; 1200M bytes	Opt.; 1200M 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	Optional	Opt.; 300 cps	Opt.; 300 cps	Opt.; 300 cps	Opt.; 300 cps
Paper tape punch	Optional	Opt.; 75 cps	Opt.; 75 cps	Opt.; 75 cps	Opt.; 75 cps
Punched card reader	Optional	Opt.; 400,1000 cpm	Opt.;400,1000 cpm	Opt.;400,1000 cpm	Opt.;400,1000 cpm
Punched card punch	Optional	No	No	No	No
Punched card reader/punch	Optional	No	No	No	No
Serial printer	Opt.; 165 cps	Opt.; 30 cps	Std.; 30 cps	Opt.; 30 cps	Opt.; 30 cps
Line printer	Std.; 300-600 lpm	Opt.;200,600 lpm	Opt.;200,600 lpm	Std.; 60 lpm	Std.; 200 lpm
Reel-to-reel tape drive	Opt.; 60 KBS	Opt.; 72 KBS	Opt.; 72 KBS	Opt.; 72 KBS	Opt.; 72 KBS
Cassette tape drive	No	Opt.; 1 KBS	Opt.; 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	Standard; 27 x 74 char.	Standard; 22 x 90 char.	Standard; 22 x 90 char.	Standard; 22 x 90 char.	Standard; 22 x 90 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	—	92	92	451	451
Synchronous	Opt.;to 9600 bps	Std.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 240K bytes	Opt.; to 240K bps
Asynchronous	Opt.; to 1200 bps	Opt.; to 1800 bps	Opt.; to 1800 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Protocols supported	None	IBM 2780/3780	IBM 2780/3780	IBM 2780/3780, SDLC, HASP	IBM 2780/3780, SDLC, HASP
SOFTWARE					
COBOL	No	Yes	Yes	Yes	Yes
RPG	No	No	No	No	No
FORTRAN	No	Yes	Yes	Yes	Yes
BASIC	Yes	Yes	Yes	Yes	Yes
Assembler	Macro assembler	Yes	Yes	Yes	Yes
Other programming languages	None	None	None	None	None
Multiprogramming	Yes; 6 partitions	Yes	Yes	Yes	Yes
Language implemented in firmware	No	No	No	No	No
Operating system implemented in firmware	No	No	No	No	No
General accounting packages	Yes	No	No	No	No
Industry application areas	Order entry, dist., metal service inv.	No	No	No	No
Data base management system	Yes	No	Yes	Yes	Yes
File access methods supported	Random, seq., direct, index seq.	None	None	None	None
Software separately priced	Yes	No	No	No	No
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$47,000	NA	$32,099	$77,159	$131,239
Monthly rental of basic system, $	Purchase only	NA	Purchase only	Purchase only	Purchase only
Date of first U.S. delivery	September 1974	January 1977	NA	NA	July 1976
Number installed in U.S. to date	5	NA	NA	NA	NA
COMMENTS	All applications software is fully integrated on-line				

*"Std." means the price of the "basic system" as listed here.

All About Small Business Computers

MANUFACTURER & MODEL	International Computers 2903	International Computers 2904	International Computing Co. System 95/99	IST Datasystems TPS	IST Datasystems BPS
DATA FORMATS					
Word length, bits	24	24	16	16	16
Decimal digits per word	7	7	4	4	4
Bytes (characters) per word	4	4	2	2	2
Operand length, words	12 bits	12 bits	Variable	1	1, 2
Instruction length, words	1	1	Variable	1	1, 2
CPU					
Model	ICL 2903	ICL 2904	DG Nova 2/10	DG Nova 3/12	DG S/200, C/300
Add time, microseconds	17.7 (12 bits)	11.8 (12 bits)	1.35	0.800 (1 word)	0.600 (1 word)
No. of programmable registers	8	8	4	4	16
No. of I/O ports on basic system and maximum	6	8	4, 7	4, 24	5, 59
INTERNAL STORAGE					
Type	MOS	MOS	Core	Core	Core
Capacity of basic system, bytes	64K (6-bit)	128K (6-bit)	32K	96K	32K, 64K
Maximum capacity, bytes	256K (6-bit)	384K (6-bit)	64K	256K	256K
Increment size, bytes	32K (6-bit)	32K (6-bit)	8K	32K	16K
Cycle time, microseconds	1.14	1.14	1.00	0.800	0.800
Access time, microseconds	0.57	0.57	0.50	0.400	0.400
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	Opt.; 4 x 315K bytes	Opt.; 500K bytes	Opt.; 500K bytes
Cartridge disk drive	Opt.; 30M bytes	Opt.; 30M bytes	Opt.; 40M bytes	Std.; 10M bytes	Std.; 10M bytes
Pack disk drive	Opt.; 240M bytes	Opt.; 240M bytes	Opt.; 368M bytes	Opt.; 92M bytes	Opt.; 92M bytes
Fixed-head disk/drum	No	No	No	Opt.; 2M bytes	Opt.; 2M bytes
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	Standard
10-key numeric keyboard	Standard	Standard	Standard	Optional	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 1000 cps	Opt.; 1000 cps	Opt.	Opt.; 400 cps	Opt.; 400 cps
Paper tape punch	Opt.; 110 cps	Opt.; 110 cps	Opt.	Opt.; 70 cps	Opt.; 70 cps
Punched card reader	Std.; 300 cpm	Std.; 300 cpm	Opt.	Opt.; 150-1000 cpm	Opt.;150-1000 cpm
Punched card punch	Opt.; 100 cpm	Opt.; 100 cpm	Opt.	No	No
Punched card reader/punch	No	No	Opt.	No	No
Serial printer	No	No	Std.; 165 cps	Std.; 165 cps	Std.; 165 cps
Line printer	Std.;300-1500 lpm	Std.;300-1500 lpm	Opt.; 600 lpm	Opt.;300-1200 lpm	Opt.;200-1200 lpm
Reel-to-reel tape drive	Opt.; 80 KBS	Opt.; 80 KBS	Std.; Link-tape	Opt.; 60 KBS	Opt.; 60 KBS
Cassette tape drive	No	No	Opt.	Optional	Optional
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Standard; 8 x 32, 20 x 50 char.	Standard; 8 x 32, 20 x 50 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	4	6	16	256	256
Synchronous	Std.;to 4800 bps	Std.; to 4800 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 50K bps
Asynchronous	Opt.; 600 bps	Opt.;600-1200 bps	Std.; 1200 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Protocols supported	ICL 7181, IBM 2780	ICL 7181, IBM 2780	2780 bisync	None	None
SOFTWARE					
COBOL	Yes	Yes	No	Yes	Yes
RPG	Yes	Yes	Yes	No	RPG II
FORTRAN	Yes	Yes	Yes	FORTRAN IV, V	FORTRAN IV, V
BASIC	Yes	No	Yes	Yes	Yes
Assembler	No	Yes	Yes	Yes	Yes
Other programming languages	None	None	LOGOS	ALGOL	ALGOL
Multiprogramming	Yes; 4 partitions	Yes; 4 partitions	Yes; 17 partitions	No	Yes; 1F, 1B
Language implemented in firmware	No	No	No	No	Fully
Operating system implemented in firmware	Partially	Partially	No	No	No
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Mfg., retail, dist.	Mfg., retail, dist.	Whse. dist., accts. payable, inv. cont.	—	—
Data base management system	Yes	Yes	No	No	INFOS
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	Some	Some
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$85,000	$135,000	$24,000	$25,000	$40,000
Monthly rental of basic system, $	$2,200	$3,500	Purchase only	Purchase only	Purchase only
Date of first U.S. delivery	July 1974	NA	October 1972	NA	September 1976
Number installed in U.S. to date	16	NA	9	NA	NA
COMMENTS	Multijobbing capability with full simultaneity; direct data entry through CRT displays (8 max.); jobs include RJE, batch, spooling	Firmware-enhanced version of 2903			

*"Std." means the price of the "basic system" as listed here.

All About Small Business Computers

MANUFACTURER & MODEL	Jacquard Systems J100 Video Computer	Litton/Sweda International Litton 1300 Cassette System	Litton/Sweda International Litton 1300 Disk System	Lockheed System III Model 1	Lockheed System III Model 2
DATA FORMATS					
Word length, bits	16	16	16	16	16
Decimal digits per word	2	4	4	3+ sign	3+ sign
Bytes (characters) per word	2	2	2	2	2
Operand length, words	1	½, 1	½, 1	2	2
Instruction length, words	1	1-7 bytes	1-7 bytes	1, 2	1, 2
CPU					
Model	Jacquard J100	Sweda In'tl. 1300	Sweda In'tl. 1300	Lockheed Sue	Lockheed Sue
Add time, microseconds	7 (1 word)	225 (5 digits)	225 (5 digits)	2.79 (1 word)	2.79 (1 word)
No. of programmable registers	4	16	16	8 (7 index)	8 (7 index)
No. of I/O ports on basic system and maximum	62	13	13	9; 33	5; 29
INTERNAL STORAGE					
Type	Core	Core	Core	Core	Core
Capacity of basic system, bytes	32K	12K	16K	16K	32K
Maximum capacity, bytes	128K	40K	40K	64K	64K
Increment size, bytes	32K	4K	4K	8K, 16K	8K, 16K
Cycle time, microseconds	1.5	1.2	1.2	0.8	0.8
Access time, microseconds	—	0.5	0.5	0.4	0.4
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Std.; 500K bytes	Opt.; 3M bytes	Std.; 3M bytes	No	No
Cartridge disk drive	Opt.; 24M bytes	No	No	Std.; 20M bytes	Std.; 20M bytes
Pack disk drive	Opt.; 320M bytes	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	No	No	Opt.; 285, 300 cpm	Opt.; 285, 300 cpm
Punched card punch	No	No	No	No	No
Punched card reader/punch	No	No	No	Opt.; 300/60 cpm	Opt.; 300/60 cpm
Serial printer	Opt.; 30-166 cps	Std.; 140 cps	Std.; 140 cps	Std.; 88,100 cps	Std.; 88,100 cps
Line printer	Opt.; 300 lpm	No	No	Opt.; 300, 600 lpm	Opt.; 300,600 lpm
Reel-to-reel tape drive	Optional	No	No	Opt.; 36 KBS	Opt.; 36 KBS
Cassette tape drive	No	Std.; 1250 cps	Opt.; 1250 cps	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.	Optional; 22 x 48 char.	Optional; 22 x 48 char.	Standard; 12 x 80 char.	Standard; 12 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	62	None	None	1	1
Synchronous	Opt.; to 9600 bps	No	No	No	No
Asynchronous	Opt.; to 9600 bps	No	No	Std.; 1200 bps	Std.; 1200 bps
Protocols supported	IBM 2780/3780, bisync	None	None	None	None
SOFTWARE					
COBOL	No	No	No	No	No
RPG	No	No	No	Yes (RPG II)	Yes (RPG II)
FORTRAN	No	No	No	Yes	Yes
BASIC	Yes	Yes	Yes	No	No
Assembler	Yes	Yes	Yes	Yes	Yes
Other programming languages	None	None	None	None	None
Multiprogramming	Yes; 256 partitions	No	No	Yes	Yes
Language implemented in firmware	No	Fully	Fully	No	No
Operating system implemented in firmware	No	Fully	Fully	No	No
General accounting packages	In development	Yes	Yes	Yes	Yes
Industry application areas	Distributed processing	Distribution, accounting	Distribution, accounting	Insurance; others thru distributors	Insurance; others thru distributors
Data base management system	No	Yes	Yes	No	No
File access methods supported	Random, sequential, index seq.	Random, sequential	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index seq.
Software separately priced	Some	Yes	Yes	Yes, FORTRAN	Yes, FORTRAN
Technical help separately priced	No	Yes	Yes	—	—
PRICING & AVAILABILITY					
Purchase price of basic system, $	$14,900	$15,465	$19,305	$32,950	$45,145
Monthly rental of basic system, $	$525	Purchase only	Purchase only	NA	NA
Date of first U.S. delivery	August 1975	September 1974	August 1975	Late 1973	March 1975
Number installed in U.S. to date	NA	800	250	300+ all models	300+ all models
COMMENTS	Turnkey system that can function as part of distributed processing network, stand-alone computer, or intelligent terminal			This system with insurance software is called Servus 100; 5M-byte disk std.	This system with insurance software is called Servus 100; 5M-byte disk std.; 3 CRT's std.

*"Std." means the price of the "basic system" as listed here.

OCTOBER 1976

All About Small Business Computers

MANUFACTURER & MODEL	Lockheed System III Model 3	Lockheed System II Models 1/2	Logical Machine Corp. ADAM	Lucero Systems Model 310	Lucero Systems Model 350
DATA FORMATS					
Word length, bits	16	16	16	12	16
Decimal digits per word	3+ sign	3+ sign	4	2	2
Bytes (characters) per word	2	2	2	2 (6-bit)	2
Operand length, words	2	2	Variable	1, 2	1, 2
Instruction length, words	1, 2	1, 2	Variable	1, 2	1, 2
CPU				DEC	DEC
Model	Lockheed Sue	Lockheed Sue	LOMAC ALP	Datasystem 310	Datasystem 350
Add time, microseconds	2.79 (1 word)	2.79 (1 word)	0.15 (5 digits)	2.8	7.0 (11/10); 1.0 (11/40)
No. of programmable registers	8 (7 index)	8 (7 index)	26	8	8; 10
No. of I/O ports on basic system and maximum	1; 25	—	8	—	—
INTERNAL STORAGE					
Type	Core	Core	MOS	Core	Core
Capacity of basic system, bytes	48K	24K/32K	32K	16K (6-bit)	32K
Maximum capacity, bytes	64K	64K	64K	64K (6-bit)	128K
Increment size, bytes	8K, 16K	8K, 16K	32K	16K (6-bit)	16K
Cycle time, microseconds	0.8	0.8	0.55	1.4	0.98
Access time, microseconds	0.4	0.4	0.25	0.7	0.49
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	No	Std.; 1.3M bytes	Std.; 256K bytes
Cartridge disk drive	Std.; 20M bytes	Std.; 20M bytes	Std.; 10.6M bytes	Opt.; 28.8M bytes	Opt.; 19.2M bytes
Pack disk drive	No	No	No	No	Opt.; 1200M 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;285,300 cpm	Opt.; 285,300 cpm	No	No	No
Punched card punch	No	No	No	No	No
Punched card reader/punch	Opt.; 300/60 cpm	Opt.; 300/60 cpm	No	No	Optional
Serial printer	Std.; 88,100 cps	Std.; 88 cps	Std.; 165 cps	Std.; 180 cps	Std.; 180 cps
Line printer	Opt.; 300, 600 lpm	Opt.; 300, 600 lpm	No	Opt.; 125-300 lpm	Opt.;125-1200 lpm
Reel-to-reel tape drive	Opt.; 36 KBS	Opt.; 36 KBS	No	No	Opt.; 72 KBS
Cassette tape drive	No	—	No	No	Opt.; 562 bps
Cartridge tape drive	No	—	No	No	Opt.; 8 KBS
Magnetic ledger card device	No	—	No	No	No
CRT	Standard; 12 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 12 x 80 char.	Standard; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	1	None	None	1	4
Synchronous	No	No	No	No	No
Asynchronous	Std.; 1200 bps	No	No	Opt.; to 4800 bps	Opt.; to 4800 bps
Protocols supported	None	None	None	IBM 2780	IBM 2780
SOFTWARE					
COBOL	No	No	No	No	No
RPG	Yes (RPG II)	No/Yes	No	No	No
FORTRAN	Yes	No/Yes	No	No	No
BASIC	No	No	No	Yes	Yes
Assembler	Yes	Yes	No	Yes	Yes
Other programming languages	None	None	ADAM English	DIBOL	DIBOL
Multiprogramming	Yes	—	No	No	Yes; 4 partitions
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	Insurance; others thru distributors	Insurance; others by contract	Business accounting, filing	Dist.; CPA's, word proc., wholesalers	Dist., manuf., auto dealers, CPA's
Data base management system	No	No	Yes	No	Yes
File access methods supported	Random, sequential, index seq.	Random, sequential, index seq.	Indexed sequential	Random, sequential	Random, sequential, index seq.
Software separately priced	Yes, FORTRAN	Yes	No	No	Yes
Technical help separately priced	—	Yes	176 hrs. free	No	No
PRICING & AVAILABILITY					
Purchase price of basic system, $	$68,520	$21,950/26,075	$39,995	$22,695	$29,023
Monthly rental of basic system, $	N.A.	N A	Purchase only	$500	$638
Date of first U.S. delivery	July 1975	N A	March 1974	June 1976	June 1976
Number installed in U.S. to date	300+ all models	N A	75	N A	N A
COMMENTS	This system with insurance software is called Servus 100; 5M-byte disk std.; 6 CRT's std.	Announced 2Q 1976; this system with insurance software is called Servus 80; 5M-byte disk std.	Self-organizing (a "logical machine"); no software aids other than English vocabulary req'd.	Turnkey system; 30-day instal. on gen. acctg. and CPA packages	

*"Std." means the price of the "basic system" as listed here.

All About Small Business Computers

MANUFACTURER & MODEL	Lucero Systems Model 500	Martin, Wolfe Inc. MESA TWO 7000 Series	Martin, Wolfe Inc. MESA TWO 4000 Series	Med Scientific International	Medical Computer Sciences System 2000
DATA FORMATS					
Word length, bits	16	16	16	16	16
Decimal digits per word	2	4, 9	4, 9	2, 4	4
Bytes (characters) per word	2	2	2	2	2
Operand length, words	1, 2	1	1	1	1-3
Instruction length, words	1, 2	1	1	1	1-3
CPU	DEC				
Model	Datasystem 500	DCC 116	DCC 116	DG Nova 3	HP 2108
Add time, microseconds	6.0 (11/34); 2.7 (11/70)	1	1	0.7-0.95	1.94 (5 digits)
No. of programmable registers	10; 16	4	4	20	5
No. of I/O ports on basic system and maximum	—	3; 11	3; 19	2	9; 41
INTERNAL STORAGE					
Type	Core, MOS	Core	Core	Core, MOS	MOS
Capacity of basic sytem, bytes	64K	32K	32K	32K	4K
Maximum capacity, bytes	2048K	64K	128K	256K (w.mem.map)	384K
Increment size, bytes	16K	32K	32K	2, 4, 8, 16K	8, 16, 32K
Cycle time, microseconds	0.98; 0.725	0.96 (2 bytes)	0.96 (2 bytes)	0.7, 0.8, 1.0	0.65
Access time, microseconds	0.49; 0.500	0.48	0.48	—	0.40
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Std.; 256K bytes	No	No	No	Std.; 300K bytes
Cartridge disk drive	Opt.; 19.2M bytes	No	No	Std.; 80M bytes	Optional
Pack disk drive	Opt.; 2400M bytes	Std.; 29.4M bytes	Std.; 268.4M bytes	No	Opt.; 160M 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	Opt.; 10 cps	No
Paper tape punch	No	No	No	Opt.; 10 cps	No
Punched card reader	No	Opt.; 300 cpm	Opt.; 300 cpm	Optional	No
Punched card punch	No	No	No	No	No
Punched card reader/punch	Optional	No	No	No	No
Serial printer	Std.; 180 cps	No	No	Opt.; 120-165 cps	No
Line printer	Opt.; 125-1200 lpm	Std.; 80-600 lpm	Std.; 80-600 lpm	Std.; 300 lpm	Std.; to 1200 lpm
Reel-to-reel tape drive	Opt.; 72 KBS	Opt.; 36 KBS	Opt.; 36 KBS	Std.; 60 KBS	Std.; 72 KBS
Cassette tape drive	Opt.; 562 bps	No	No	No	Standard
Cartridge tape drive	Opt.; 8 KBS	No	No	No	Standard
Magnetic ledger card device	No	No	No	No	No
CRT	Standard; 24 x 80 char.	Standard; 27 x 74 char.	Standard; 27 x 74 char.	Standard; 20 x 50, 24 x 80 char.	Standard; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	63	16	16	64	64
Synchronous	Opt.; to 9600 bps	Opt.; to 4800 bps	Opt.; to 4800 bps	Opt.; to 9600 bps	Opt.; to 9600 bps
Asynchronous	Opt.; to 9600 bps	Opt.; to 1200 bps	Opt.; to 1200 bps	Std.; to 9600 bps	Std.; to 9600 bps
Protocols supported	IBM 2780	IBM 3780, HASP	IBM 3780, HASP	None	None
SOFTWARE					
COBOL	Yes	No	No	No	No
RPG	Yes	Yes	Yes	No	No
FORTRAN	Yes	No	No	No	Yes
BASIC	Yes	No	No	No	Yes
Assembler	Yes	No	No	Yes	Yes
Other programming languages	DIBOL	MESA RPG II, FPG	MESA RPG II, FPG	None	ALGOL
Multiprogramming	Yes	Yes; 2 partitions	Yes; 2 partitions	No	No
Language implemented in firmware	No	No	No	No	Partially
Operating system implemented in firmware	No	No	No	Fully	No
General accounting packages	Yes	Yes	Yes	No	Yes
Industry application areas	Dist., manuf., auto dealers, time-share	Dist., broadcasting, auto parts, medicine	Dist., broadcasting, auto parts, medicine	Medical	Hospital
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.	Index sequential	Sequential, index sequential
Software separately priced	Yes	No	No	No	Yes
Technical help separately priced	No	Yes	Yes	Yes	No
PRICING & AVAILABILITY					
Purchase price of basic system, $	$39,875	$54,100	$62,100	$110,000	$150,000-550,000
Monthly rental of basic system, $	$877	Purchase only	Purchase only	NA	$2,500-$7,500
Date of first U.S. delivery	July 1976	December 1971	February 1976	NA	October 1973
Number installed in U.S. to date	NA	140+	3	NA	15
COMMENTS		System designed for data base management with remote job entry	System designed for data base management with remote job entry	System is designed for pharmacy; a similar system for the laboratory is available at $140,000	Separate systems for on-line admissions and charge collection also available

*"Std." means the price of the "basic system" as listed here.

All About Small Business Computers

MANUFACTURER & MODEL	Microdata Express I	Microdata Express II	Microdata Reality	Midas Systems Corporation	Mini-Computer Systems MICOS
DATA FORMATS					
Word length, bits	16	16	16	8-bit byte	16
Decimal digits per word	4	4	2	1 per byte	4
Bytes (characters) per word	2	2	2	1 per byte	2
Operand length, words	Variable	Variable	½, 1, 2, 3	1 byte	Variable
Instruction length, words	½—1½	½—1½	½, 1, 2, 3	1-4 bytes	1, 2, 3
CPU					
Model	Microdata 32/S	Microdata 32/S	Microdata 1600	Datapoint 1100	DG Nova 2/10
Add time, microseconds	2	2	5	4.8	1.2
No. of programmable registers	7	—	34	14	4
No. of I/O ports on basic system and maximum	1024	1024	—	1	62 max.
INTERNAL STORAGE					
Type	MOS	MOS	Core	MOS	Core
Capacity of basic system, bytes	64K	64K	16K	16K	65K
Maximum capacity, bytes	128K	1024K	128K	16K	65K + 65K SWAP
Increment size, bytes	64K	64K	8, 16K	—	—
Cycle time, microseconds	0.4	0.4	1	1.6	1 or 0.8
Access time, microseconds	0.3	0.3	—	—	0.5 or 0.4
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	No	Std.; 1M bytes	No
Cartridge disk drive	Opt.; 40M bytes	Opt.; 40M bytes	Std.; 40M bytes	Optional	Std.; 9.8M bytes
Pack disk drive	Std.; 50M bytes	Std.; 900M bytes	Opt.; 900M bytes	Optional	Opt.; 40-80M bytes
Fixed-head disk/drum	No	Std.; 2M bytes	Opt.; 2M bytes	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	No	No	No
Paper tape punch	No	No	No	No	No
Punched card reader	Opt.; 200-1000 cpm	Opt.;200-1000 lpm	Opt.;150-600 cpm	Opt.; 300 cpm	Opt.;300-1000 cpm
Punched card punch	No	No	No	No	No
Punched card reader/punch	No	No	Opt.; 200/75 cpm	No	No
Serial printer	Opt.; 165 cps	Opt.; 165 cps	Opt.; 165 cps	Opt.; 30-240 cps	Std.; 165, 330 cps
Line printer	Opt.; 125-600 lpm	Opt.;125-600 lpm	Opt.; 300-600 lpm	Opt.; 300-600 lpm	Opt.; 300, 600 lpm
Reel-to-reel tape drive	No	No	Std.; 20, 40 KBS	Opt.; 7-20 KBS	Opt.; 30-120 KBS
Cassette tape drive	No	No	No	Opt.; 352 cps	No
Cartridge tape drive	Std.; 24 KBS	Std.; 24 KBS	Opt.; 12.8 KBS	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 25 x 80 char.	Standard; 12 x 80 char.	Standard; 12 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	8	32	32	—	1
Synchronous	Opt.; to 50K bps	Opt.; to 50K bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; 50,000 bps
Asynchronous	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	No
Protocols supported	IBM 3780, bisync	IBM 3780, bisync	IBM 2780	IBM 2780/3780	IBM 2780, HASP, CDC 200 UT
SOFTWARE					
COBOL	Yes	Yes	No	No	No
RPG	No	No	Yes	No	No
FORTRAN	Yes	Yes	No	No	No
BASIC	Yes	Yes	Yes	No	Yes (Extensive)
Assembler	No	No	Yes	No	No
Other programming languages	EPL	EPL	English	None	None
Multiprogramming	Yes	Yes	Yes	No	Yes
Language implemented in firmware	Partially	Partially	Partially	No	No
Operating system implemented in firmware	Partially	Partially	Partially	No	No
General accounting packages	No	No	Yes	Yes	Yes
Industry application areas	Distributed proc., order entry	Distributed proc., order entry	Engin., educ., time-share,acctg.	Acctg., medical, bowling establish.	Munic. govt.,educ., fuel,apparel,etc.
Data base management system	No	No	Yes	No	No
File access methods supported	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential	—	Random, sequential
Software separately priced	No	No	No	—	Yes
Technical help separately priced	Yes	Yes	No	—	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$19,950	$27,650	$33,900	$22,000	$49,900
Monthly rental of basic system, $	Purchase only	Purchase only	Purchase only	Purchase only	NA
Date of first U.S. delivery	December 1976	December 1976	November 1973	March 1976	March 1973
Number installed in U.S. to date	NA	NA	500+	6	Over 250
COMMENTS	Designed for OEM and large-volume users who can provide their own application software; discounts of up to 25% are available	Designed for OEM and large-volume users who can provide their own application software; discounts of up to 25% are available	A popular multi-user, real-time system; marketed through a nationwide dealer network		3 CRT's std.

*"Std." means the price of the "basic system" as listed here.

All About Small Business Computers

MANUFACTURER & MODEL	Minuteman Computer Corp. 1774	Minuteman Computer Corp. 1775	Minuteman Computer Corp. 1776	MIS International 4501-0502	Mylee Digital Sciences 3056
DATA FORMATS					
Word length, bits	16	16	16	8-bit byte	16
Decimal digits per word	2	2	2	1 per byte	2
Bytes (characters) per word	2	2	2	1 per byte	2
Operand length, words	1	1	1	—	½—8
Instruction length, words	1, 2	1, 2	1, 2	4, 8 bytes	1-3
CPU					
Model	DG Nova 2/4	DG Nova 2/10	DG Nova 2/10	NCR 8200, etc.	Mylee 3G
Add time, microseconds	2.7	2.7	2.7	—	125 (5 digits)
No. of programmable registers	5	5	5	27	4
No. of I/O ports on basic system and maximum	2	14	14	4; 8	11; 19
INTERNAL STORAGE					
Type	Core	Core	Core	Core	MOS
Capacity of basic system, bytes	16K	16K	32K	32K	56K
Maximum capacity, bytes	32K	64K	64K	128K	152K
Increment size, bytes	8, 16K	8, 16, 32K	8, 16, 32K	8K	32K
Cycle time, microseconds	0.8; 1.0	0.8; 1.0	0.8; 1.0	1.2 (2 bytes)	0.8
Access time, microseconds	—	—	—	—	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	No	No	No
Cartridge disk drive	Std.; 40M bytes	Std.; 40M bytes	Std.; 40M bytes	Opt.; 10M bytes	Std.; 96M bytes
Pack disk drive	Optional	Optional	Optional	Opt.; 39.2M 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	Optional	Standard
Full accounting keyboard	No	No	No	Optional	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Optional	Optional	Optional	Opt.; 30 cps	No
Paper tape punch	Optional	Optional	Optional	Opt.; 15 cps	No
Punched card reader	Optional	Optional	Optional	Opt.; 300 cpm	Opt.; 300 cpm
Punched card punch	Optional	Optional	Optional	Opt.; 150 cpm	No
Punched card reader/punch	Optional	Optional	Optional	No	No
Serial printer	Std.; 165 cps	Std.; 165 cps	Std.; 165 cps	Opt.; 150-300 cps	Std.; 165 cps
Line printer	Opt.; 300-900 lpm	Opt.; 300-900 lpm	Opt.; 300-900 lpm	Opt.; 100-1200 lpm	Opt.; 300 lpm
Reel-to-reel tape drive	Optional	Optional	Optional	No	No
Cassette tape drive	Optional	Optional	Optional	Std.; 750 bps	No
Cartridge tape drive	Optional	Optional	Optional	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 (2); 11 x 32 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	1	1	1	7	16
Synchronous	Optional	Optional	Optional	No	No
Asynchronus	Optional	Optional	Optional	Std.; to 9600 bps	Opt.; to 1200 bps
Protocols supported	None	None	None	IBM SDLC	None
SOFTWARE					
COBOL	Yes	Yes	Yes	Yes	No
RPG	No	No	No	No	No
FORTRAN	Yes	Yes	Yes	No	No
BASIC	Yes	Yes	Yes	No	No
Assembler	Yes	Yes	Yes	No	No
Other programming languages	None	None	None	Text Editor	ACE
Multiprogramming	No	No	No	Yes; 7 partitions	Yes; 12 partitions
Language implemented in firmware	No	No	No	Partially	Partially
Operating system implemented in firmware	No	No	No	Partially	Partially
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Dist., mfg., liquor wholesalers	Dist., mfg., liquor wholesalers	Dist., mfg., liquor wholesalers	Warehousing, distribution	Dist., inventory, accounting
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.	Yes	Indexed 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, $	$34,995	$36,995	$39,995	$40,000	$37,500
Monthly rental of basic system, $	Purchase only	Purchase only	Purchase only	$1,200-$3,000	Purchase only
Date of first U.S. delivery	1973	1973	1973	May 1976	May 1976
Number installed in U.S. to date	10	30	40	NA	12
COMMENTS	Turnkey system	Turnkey system	Turnkey system	Pricing will vary depending on CPU selected: NCR 8200, Interdata 8/32, or Data General Eclipse	Turnkey system; user has choice of 1 of 8 inventory management packages included with system

*"Std." means the price of the "basic system" as listed here.

OCTOBER 1976

All About Small Business Computers

MANUFACTURER & MODEL	Mylee Digital Sciences 3088	NCR 299-100	NCR 299-200	NCR 399	NCR 499
DATA FORMATS					
Word length, bits	16	64	64	16	16
Decimal digits per word	2	16	16	4	4
Bytes (characters) per word	2	8	8	2	2
Operand length, words	½-8	1	1	12 bits	12 bits
Instruction length, words	1-3	1	1	Variable	Variable
CPU					
Model	Mylee 3G	NCR 299	NCR 299	NCR 605	NCR 605
Add time, microseconds	125 (5 digits)	220 milliseconds	220 milliseconds	1700 (5 digits)	1700 (5 digits)
No. of programmable registers	4	10-50 (in mem.)	30-100 (in mem.)	0	0
No. of I/O ports on basic system and maximum	11; 19	3, 5 devices	3, 10 devices	4, 15	4, 15
INTERNAL STORAGE					
Type	MOS	Core	Core	Core	Core
Capacity of basic system, bytes	88K	4K bits	8K bits	8K	12K
Maximum capacity, bytes	152K	8K bits	16K bits	32K	32K
Increment size, bytes	32K	4K bits	8K bits	2K, 4K	2K, 4K
Cycle time, microseconds	0.8	7 (per bit)	7 (per bit)	1.2	1.2
Access time, microseconds	—	—	—	0.650	0.650
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	No	No	No
Cartridge disk drive	Std.; 96M bytes	No	No	Opt.; 9.8M bytes	Opt.; 9.8M bytes
Pack disk drive	No	No	No	No	No
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Yes	Yes	Yes	Yes
10-key numeric keyboard	Standard	Yes	Yes	Yes	Yes
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	No	No	Opt.; 125 cps	Opt.; 125 cps
Paper tape punch	No	Opt.; 50 cps	Opt.; 50 cps	Opt.; 75 cps	Opt.; 75 cps
Punched card reader	Opt.; 300 cpm	No	No	Opt.; 300 cpm	Opt.; 300 cpm
Punched card punch	No	No	No	Opt.; 13-26 col./sec	Opt.; 13-26 col./sec.
Punched card reader/punch	No	No	No	No	No
Serial printer	Std.; 165 cps	Std.; 15 cps	Std.; 15 cps	Std.; 24 cps	Std.; 75, 130 cps
Line printer	Opt.; 300 lpm	No	No	Opt.; 55-300 lpm	Opt.; 55-300 lpm
Reel-to-reel tape drive	No	No	No	No	No
Cassette tape drive	No	Opt.; 750 cps	Opt.; 750 cps	Std.; 750 cps	Std.; 750 cps
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	Optional	Optional	Opt.; 47 cpm	Opt.; 47 cpm
CRT	Standard (2); 11 x 32 char.	No	No	Standard; 24 x 80 char.	Standard; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	16	None	1	1	2
Synchronous	No	None	None	Opt.; to 9600 bps	Opt.; to 9600 bps
Asynchronous	Opt.; to 1200 bps	None	Opt.; 1200 bps	Opt.; to 1800 bps	Opt.; to 1800 bps
Protocols supported	None	None	None	Bisync	Bisync
SOFTWARE					
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	No	No
Other programming languages	ACE	None	None	NEAT/AM	NEAT/AM
Multiprogramming	Yes; 12 partitions	No	No	No	No
Language implemented in firmware	Partially	Yes	Yes	No	No
Operating system implemented in firmware	Partially	Yes	Yes	No	No
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Dist., inventory, accounting	Retail, financial, mfg., wholesale	Retail, financial, mfg., wholesale	All business accounting	All business accounting
Data base management system	Yes	No	No	No	No
File access methods supported	Indexed sequential	None	None	Random, sequential	Random, sequential
Software separately priced	Some	Yes	Yes	Yes	Yes
Technical help separately priced	No	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$40,750	$7,250	$9,300	No longer sold (See comments)	$17,900
Monthly rental of basic system, $	Purchase only	Purchase only	$310	$420	Purchase only
Date of first U.S. delivery	May 1976	January 1974	January 1974	November 1972	February 1976
Number installed in U.S. to date	6	15,000 (both mdls.)	15,000 (both mdls.)	6,000	300
COMMENTS	Turnkey system; user has choice of 1 of 8 inventory management packages included with system	User-programmed through unique optically read coding sheets	User-programmed through unique optically read coding sheets	Replaced by NCR 499	

*"Std." means the price of the "basic system" as listed here.

All About Small Business Computers

MANUFACTURER & MODEL	NCR 8200	NCR Century 50 and 50 Mod 1	NCR Century 75	NCR Century 100	NCR Century 101
DATA FORMATS					
Word length, bits	16	8	8	8	8
Decimal digits per word	4	2	2	2	2
Bytes (characters) per word	2	1	1, 2	1	1
Operand length, words	1	1-256	1-256	1-256	1-256
Instruction length, words	1, 2, 3	4-8	4-8	4-8	4-8
CPU					
Model	NCR 605	NCR 615-910	NCR 615-950	NCR 615-910	NCR 615-952
Add time, microseconds	2.4 (8 digits)	59 (5 digits)	28.8 (5 digits)	59 (5 digits)	25.2 (5 digits)
No. of programmable registers	0	63	—	63	63
No. of I/O ports on basic system and maximum	5, 8	6, 7	2, 2	6, 7	5, 32
INTERNAL STORAGE					
Type	Core	Thin film	Core	Thin film	Core
Capacity of basic system, bytes	32K	16K	16K	16K	16K
Maximum capacity, bytes	128K	32K	64K	32K	128K
Increment size, bytes	8K	16K	8K, 16K	16K	8, 16, 32K
Cycle time, microseconds	1.2	0.800	1.2	0.800	1.2
Access time, microseconds	0.650	—	0.600	—	0.600
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	No	No	No
Cartridge disk drive	Std.; 39.2M bytes	No	No	No	Std.; 19.6M bytes
Pack disk drive	No	Std.; 16M bytes	Std.; 9.98M bytes	Std.; 16M bytes	Opt.; 380M 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	No	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	No	Opt.;1000,1500 cps	No	Opt.;1000,1500 cps	Opt.;1000,1500 cps
Paper tape punch	No	Opt.; 200 cps	No	Opt.; 200 cps	Opt.; 200 cps
Punched card reader	Opt.; 300 cpm	Std.; 300 cpm	No	Std.; 300 cpm	Std., 300 cpm
Punched card punch	No	Opt.;60-294 cpm	No	Opt.; 60-294 cpm	Opt.; 60-294 cpm
Punched card reader/punch	No	No	Std.; 300 cpm	No	No
Serial printer	Opt.; 175 cps	Opt.; 6 cps	No	Opt.; 6 cps	Opt.; 6 cps
Line printer	Opt.; 100-300 lpm	Std.; 125-900 lpm	Std.; 200-450 lpm	Std.; 450-1500 lpm	Std.; 300-3500 lpm
Reel-to-reel tape drive	No	Opt.; 10-80 KBS	No	Opt.; 10-40 KBS	Opt.; 40-320 KBS
Cassette tape drive	Std.; 750 cps	Opt.; 750 cps	Opt.; 750 cps	Opt.; 750 cps	Opt.; 750 cps
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Standard; 24 x 80 char.	Optional; 24 x 80 char.	Optional; 24 x 80 char.	Optional; 24 x 80 char.	Optional; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	7	16	10	16	255
Synchronous	Opt.; to 9600 bps	Opt.; to 9600 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, bisync	IBM 2780, bisync	IBM 2780, bisync	IBM 2780, bisync	IBM 2780 bisync
SOFTWARE					
COBOL	Yes	Yes	Yes	Yes	Yes
RPG	No	RPG II	Yes	RPG II	RPG II
FORTRAN	No	No	Yes	No	FORTRAN IV
BASIC	No	Yes	Yes	Yes	Yes
Assembler	Yes	No	Yes	No	Yes
Other programming languages	NEAT/3	NEAT/3	NEAT/3	NEAT/3	NEAT/3
Multiprogramming	Yes; 7 partitions	No	No	No	Yes; 9 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	Yes
Industry application areas	Hosp. acctg., govt., dist./whlsl.	All business applications	All business applications	All business applications	All business applications
Data base management system	No	No	Yes	No	TOTAL
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	Some	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$33,420	$32,000	$56,850	$40,000	$69,520
Monthly rental of basic system, $	$945	$1,075	$1,650	$1,600	$2,005
Date of first U.S. delivery	September 1974	December 1970	May 1976	March 1963	August 1972
Number installed in U.S. to date	300-400	1,100 Century 50's and 100's	50	1,100 Century 50's and 100's	1,200
COMMENTS		Century 50 and 50 Mod. I are no longer manufact- ured; see Report 70C-656-01 for more details	See Report 70C-656-01 for more details	Century 100 is no longer manufact- ured; see Report 70C-656-01 for more details	See Report 70C-656-01 for more details

*"Std." means the price of the "basic system" as listed here.

All About Small Business Computers

MANUFACTURER & MODEL	Nixdorf 8870	Nixdorf 840	Norfield Datasystems (Nova-based system)	Norfield Datasystems (Eclipse-based system)	Northrop Data Systems BDS 100
DATA FORMATS					
Word length, bits	16	12	16	16	Variable, 8-32
Decimal digits per word	4	1, 2, 3	2	4	1-7
Bytes (characters) per word	2	1, 2	2	2	1-4
Operand length, words	1	1	1, 2	½, 1, 2	Variable
Instruction length, words	1	1-4	1	1, 2	Variable
CPU					
Model	DCC 116-H	Nixdorf 154	DG Nova	DG Eclipse C/300	Microdata 1600
Add time, microseconds	1.0 (1 word)	8.0 (1 word)	0.800 (1 word)	0.600 (1 word)	9.68 (7 digits)
No. of programmable registers	4	2	5	12	16
No. of I/O ports on basic system and maximum	13, 18	3, 5	3, 62	3, 59	4, 16
INTERNAL STORAGE					
Type	Core	Core	Core	Core	Core
Capacity of basic system, bytes	64K	6K	32K	32K	16K
Maximum capacity, bytes	64K	24K	256K	128K	64K
Increment size, bytes	None	6K	16K	16K	8, 16K
Cycle time, microseconds	0.96	2.0	0.800	0.800	1
Access time, microseconds	0.48	1.0	0.400	0.400	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	No	No	No
Cartridge disk drive	Std.; 40M bytes	No	Std.; 40M bytes	Std.; 40M bytes	Std.; 10M bytes
Pack disk drive	No	Opt.; 2.8M bytes	Opt.; 200M bytes	Opt.; 200M 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	No	No	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 300 cps	Opt.; 200 cps	Opt.; 400 cps	Opt.; 400 cps	No
Paper tape punch	Opt.; 75 cps	Opt.; 25 cps	Opt.; 63 cps	Opt.; 63 cps	No
Punched card reader	Opt.; 300 cpm	Opt.; 60 cpm	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm
Punched card punch	No	Opt.; 1-10 cpm	No	No	No
Punched card reader/punch	No	No	No	No	No
Serial printer	Std.; 165 cps	Std.; 100,165 cps	Opt.; 100-420 cps	Opt.; 100-420 cps	Opt.; 30-120 cps
Line printer	Opt.; 300,600 lpm	No	Opt.; 300,600 lpm	Opt.; 300,600 lpm	Std.; 200 lpm
Reel-to-reel tape drive	Opt.; 10, 20 KBS	Opt.; 10, 20 KBS	Opt.; 20-72 KBS	Opt.; 20-72 KBS	Opt.; 20 KBS
Cassette tape drive	No	Opt.; 435 cps	Opt.; 750 cps	Opt.; 750 cps	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	Opt.; 2000 cards/hr.	No	No	No
CRT	Standard; 27 x 74 char.	No	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	9	1	32 (typical)	128 (typical)	4
Synchronous	Opt.;	Opt.; to 2400 bps	Opt.; 50K bps	Opt.; 50K bps	No
Asynchronous	Std.; to 9600 bps	Opt.; to 1800 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Std.; to 1200 bps
Protocols supported	None	IBM 2260, 2740; Univac DCT 2000	IBM 2780, bisync, SDLC, HASP	IBM 2780, bisync, SDLC, HASP	None
SOFTWARE					
COBOL	No	No	No	Yes	No
RPG	No	No	No	Yes	No
FORTRAN	No	No	No	Yes	No
BASIC	Yes	No	Yes	Yes	Yes
Assembler	Yes	Yes	Yes	Yes	Yes
Other programming languages	None	BOSS	83B3, 85A1, 8A1	83B3, 85A1, 8A1	None
Multiprogramming	Yes	No	Yes; 2 partitions	Yes	Yes; 3 partitions
Language implemented in firmware	No	Fully	No	Fully	Partially
Operating sytem implemented in firmware	No	Fully	No	No	Partially
General accounting packages	No	Yes	No	No	Yes
Industry application areas	Distribution, medical, garment	Mortgage, automobile, gen'l. acct'g.	Automated reporting order entry	Automated reporting, order entry	Hospital, medical, furniture manuf.
Data base management system	No	No	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	No	No	Yes
Technical help separately priced	Yes	Yes	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$39,990	$22,490	$35,000	$75,000	$49,276
Monthly rental of basic system, $	$851	$485	$1,250	$3,000	Purchase only
Date of first U.S. delivery	1975	November 1973	June 1973	NA	June 1972
Number installed in U.S. to date	NA	3,000	Over 20	NA	20
COMMENTS	Turnkey system that includes NIDAS distribution accounting system		Automated reporting system for organizations with multiple dispersed operations		

*"Std." means the price of the "basic system" as listed here.

All About Small Business Computers

MANUFACTURER & MODEL	Northrop Data Systems BDS 2000	Olivetti A4	Olivetti A5 Model 10	Olivetti A5 Model 20	Olivetti A5 Model 30
DATA FORMATS					
Word length, bits	Variable, 8-32	8-bit byte	64	64	64
Decimal digits per word	1-7	2 per byte	15	15	15
Bytes (characters) per word	1-4	1 per byte	8	8	8
Operand length, words	Variable	—	8 bits	8 bits	8 bits
Instruction length, words	Variable	1, 2 bytes	4 inst. per word	4 inst. per word	4 inst. per word
CPU					
Model	Microdata 1600	Olivetti 4000	Olivetti 5010	Olivetti 5020	Olivetti 5030
Add time, microseconds	9.68 (7 digits)	150 milliseconds	10 (word)	10 (word)	10 (word)
No. or programmable registers	16	10	47	111, 229, 485	111, 229, 485
No. of I/O ports on basic system and maximum	4; 16	1	2	2	2
INTERNAL STORAGE					
Type	Core	MOS	MOS	MOS	MOS
Capacity of basic system, bytes	24K	224	0.5K	1K	1K
Maximum capacity, bytes	64K	224	4K	4K	4K
Increment size, bytes	8, 16K	—	1, 2K	1, 2K	1, 2K
Cycle time, microseconds	1	5 milliseconds	1.5	1.5	1.5
Access time, microseconds	—	—	—	—	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	No	No	No
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	No	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	Opt.; 20 cps
Paper tape punch	No	Opt.; 24 cps	Opt.; 24 cps	Opt.; 24 cps	Opt.; 24 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.; 30-120 cps	Std.; 16 cps	Std.; 16 cps	Std.; 16 cps	Std.; 16 cps
Line printer	Std.; 300-600 lpm	No	No	No	Opt.; 60 lpm
Reel-to-reel tape drive	Opt.; 20 KBS	No	No	No	No
Cassette tape drive	No	Opt.; 1000 cps	Opt.; 1000 cps	Opt.; 1000 cps	Opt.; 1000 cps
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	No	No	No	No
CRT	Standard; 24 x 80 char.	No	No	No	No
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	8	None	1	1	1
Synchronous	No	No	Opt.; to 4800 bps	Opt.; to 4800 bps	Opt.; to 4800 bps
Asynchronous	Std.; to 1200 bps	No	Opt.; to 1200 bps	Opt.; to 1200 bps	Opt.; to 1200 bps
Protocols supported	None	None	IBM 2848, 2260, 2780	IBM 2848, 2260, 2780	IBM 2848, 2260, 2780
SOFTWARE					
COBOL	No	No	No	No	No
RPG	No	No	No	No	No
FORTRAN	No	No	No	No	No
BASIC	Yes	No	No	No	No
Assembler	Yes	No	Yes	Yes	Yes
Other programming languages	None	BAL	APCO	APCO	APCO
Multiprogramming	Yes; 7 partitions	No	No	No	No
Language implemented in firmware	Partially	Fully	Fully	Fully	Fully
Operating system implemented in firmware	Partially	Fully	No	No	No
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Hospital, medical, furniture manuf.	Credit union, finan., fuel oil	Credit union, educ., dist.	Credit union, educ., dist.	Credit union, educ., dist.
Data base management system	Yes	No	No	No	No
File access methods supported	Random sequential, index seq.	None	None	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, $	$62,592	$2,395	$4,900	$6,250	$6,900
Monthly rental of basic system, $	Purchase only	$86.45 (3-yr. lease)	$177 (3-yr. lease)	$220 (3-yr. lease)	$243 (3-yr. lease)
Date of first U.S. delivery	October 1973	November 1975	February 1975	February 1975	February 1975
Number installed in U.S. to date	30	1000	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 I/O

*"Std." means the price of the "b sic system" as listed here.

All About Small Business Computers

MANUFACTURER & MODEL	Olivetti A6 Model 40	Olivetti A7 Model 71	Olivetti A7 Model 72	Olivetti A7 Model 74	Pako Corp. Pricing System
DATA FORMATS					
Word length, bits	64	8-bit byte	8-bit byte	8-bit byte	16
Decimal digits per word	15	2 per byte	2 per byte	2 per byte	4
Bytes (characters) per word	8	1 per byte	1 per byte	1 per byte	2
Operand length, words	8 bits	1-3 bytes	1-3 bytes	1-3 bytes	1
Instruction length, words	4 inst. per word	1, 2 bytes	1, 2 bytes	1, 2 bytes	1, 2
CPU					
Model	Olivetti 5040	Olivetti 7071	Olivetti 7072	Olivetti 7074	CAI LSI 2/20
Add time, microseconds	10 (word)	6.1	6.1	6.1	25 (8 digits)
No. of programmable registers	229, 485	—	—	—	2
No. of I/O ports on basic system and maximum	4	16	16	16	—
INTERNAL STORAGE					
Type	MOS	MOS	MOS	MOS	Core
Capacity of basic system, bytes	2K	16K	16K	16K	32K
Maximum capacity, bytes	4K	32K	48K	48K	64K
Increment size, bytes	2K	8K	8K	8K	16K
Cycle time, microseconds	1.5	0.9	0.9	0.9	1.2
Access time, microseconds	—	—	—	—	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Opt.; 1.2M bytes	No	No	Std.; 512K bytes	Opt.; 500K bytes
Cartridge disk drive	No	Opt.; 40M bytes	Opt.; 40M bytes	Opt.; 40M bytes	No
Pack disk drive	No	No	No	No	No
Fixed-head disk/drum	No	Opt.; 160K bytes	Opt.; 160K bytes	Opt.; 160K bytes	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	Standard	No
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.; 20 cps	Opt.; 20 cps	Opt.; 150 cps
Paper tape punch	Opt.; 24 cps	Opt.; 24 cps	Opt.; 24 cps	Opt.; 24 cps	Opt.; 75 cps
Punched card reader	No	Opt.; 400 cpm	Opt.; 400 cpm	Opt.; 400 cpm	Opt.; 300 cpm
Punched card punch	No	Opt.; 320 cpm	Opt.; 320 cpm	Opt.; 320 cpm	Opt.; 23 cpm
Punched card reader/punch	No	No	No	No	No
Serial printer	Std.; 16 cps	Std.; 40-175 cps	Std.; 40-175 cps	Std.; 40-175 cps	No
Line printer	Opt.; 60-300 lpm	Opt.; 300-600 lpm	Opt.; 300-600 lpm	Opt.; 300-600 lpm	No
Reel-to-reel tape drive	No	No	No	No	Optional
Cassette tape drive	Opt.; 1000 cps	Opt.; 1000 cps	Std.; 1000 cps	Opt.; 1000 cps	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	Optional	Optional	Optional	Optional	No
CRT	No	No; system incl. 16-char. a/n disp.	No; system incl. 16-char. a/n disp.	No; system incl. 16-char. a/n disp.	No
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	1	1	1	1	1
Synchronous	Opt.; to 4800 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 2400 bps
Asynchronous	Opt.; to 1200 bps	Opt.; to 1200 bps	Opt.; to 1200 bps	Opt.; to 1200 bps	No
Protocols supported	IBM 2848, 2260, 2780	Bisync	Bisync	Bisync	IBM 2780
SOFTWARE					
COBOL	No	No	No	No	No
RPG	No	Yes	Yes	Yes	No
FORTRAN	No	No	No	No	No
BASIC	No	No	No	No	No
Assembler	Yes	Yes	Yes	Yes	No
Other programming languages	APCO	PL/1	PL/1	PL/1	None
Multiprogramming	No	Yes; 2 partitions	Yes; 2 partitions	Yes; 2 partitions	Yes; 10 partitions
Language implemented in firmware	Fully	Fully	Fully	Fully	No
Operating system implemented in firmware	Partially	Partially	Partially	Partially	No
General accounting packages	Yes	Yes	Yes	Yes	No
Industry application areas	Credit union, educ., dist.	Credit union, educ., dist.	Credit union, educ., dist.	Credit union, educ., dist.	Photofinishing
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.	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, $	$8,820	$15,500	$16,500	$18,450	$32,370
Monthly rental of basic system, $	$310 (3-yr. lease)	$542.50 (3-yr. lease)	$577.50 (3-yr. lease)	$645.75 (3-yr. lease)	Purchase only
Date of first U.S. delivery	January 1976	March 1975	March 1975	March 1975	June 1975
Number installed in U.S. to date	NA	NA	NA	NA	NA
COMMENTS	Integral mag card unit allows mag cards to be used for program storage and data I/O				Incl. 1 pricing term. (8 opt.) w. bar code reader & kybd.; bar code is read & pricing info. printed on customer envelope

*"Std." means the price of the "basic system" as listed here.

All About Small Business Computers

MANUFACTURER & MODEL	Pako Corp. Pricing/Invoicing System	Philips P310	Philips P320	Philips P350	Programmed Control Corp. Prophet 21 Model 1
DATA FORMATS					
Word length, bits	16	8-bit byte	8-bit byte	64	16
Decimal digits per word	4	1 per byte	1 per byte	15	4
Bytes (characters) per word	2	1 per byte	1 per byte	8	2
Operand length, words	1	Variable	Variable	1	1
Instruction length, words	1, 2	Variable	Variable	1	2
CPU					
Model	CAI LSI 2/20	Philips P310	Philips P320	Philips P350	TI 960B
Add time, microseconds	25 (8 digits)	—	—	—	3.6 (word)
No. of programmable registers	2	8	8	Software-assigned	16
No. of I/O ports on basic system and maximum	—	10	10	16	1, 22
INTERNAL STORAGE					
Type	Core	Core	Core	Core	MOS
Capacity of basic system, bytes	32K	8K	8K	600 words	32K
Maximum capacity, bytes	64K	16K	16K	1200 words	128K
Increment size, bytes	16K	8K	8K	200 words	8K
Cycle time, microseconds	1.2	1.5	1.5	1.5	0.7
Access time, microseconds	—	0.6	0.6	0.6	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	No	No	No
Cartridge disk drive	Std.; 10M bytes	No	No	Opt.; 9.2M bytes	Std.; 35M 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.; 50 cps	No
Paper tape punch	Opt.; 75 cps	Opt.; 50 cps	Opt.; 50 cps	Opt.; 50 cps	No
Punched card reader	Opt.; 300 cpm	No	No	Opt.; 280 cpm	No
Punched card punch	Opt.; 23 cpm	Opt.; 50 cpm	Opt.; 50 cpm	Opt.; 50 cpm	No
Punched card reader/punch	No	No	No	No	No
Serial printer	No	Std.; 50 cps	Std.; 50 cps	Std.; 40 cps	Std.; 10 cps
Line printer	Std.; 125-300 lpm	No	No	Opt.; 120-600 lpm	Opt.; 250 lpm
Reel-to-reel tape drive	Optional	No	No	No	No
Cassette tape drive	No	Opt.; 1000 cps	Opt.; 1000 cps	Opt.; 1000 cps	No
Cartridge tape drive	No	No	No	No	No
Magnetic ledger card device	No	Optional	Standard	Standard	No
CRT	Optional; 24 x 80 char.	No	No	No	Standard; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	1	1	1	1	—
Synchronous	Opt.; to 2400 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	No
Asynchronous	No	Opt.; to 2400 bps	Opt.; to 2400 bps	Opt.; to 2400 bps	Opt.; to 1200 bps
Protocols supported	IBM 2780	IBM 2780	IBM 2780	IBM 2780	None
SOFTWARE					
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	No
Other programming languages	None	None	None	None	Prophet 21
Multiprogramming	Yes; 15 partitions	No	No	No	Yes; 22 partitions
Language implemented in firmware	No	Partially	Partially	No	No
Operating system implemented in firmware	No	Partially	Partially	No	No
General accounting packages	No	Yes	Yes	Yes	Yes
Industry application areas	Photofinishing	Banking, insurance, medical, utilities	Banking, insurance, medical, utilities	Banking, insurance, medical, utilities	Dist., beverage mfg. & wholesaler
Data base management system	Yes	No	No	No	Yes
File access methods supported	Random, sequential, index seq.	None	None	Random, sequential, index seq.	Random, sequential, index seq.
Software separately priced	Yes	Yes	Yes	Yes	No
Technical help separately priced	Yes	Yes	Yes	Yes	No
PRICING & AVAILABILITY					
Purchase price of basic system, $	$69,645	$7,000-$10,500	$13,500-$15,200	$15,500-$26,500	$42,500
Monthly rental of basic system, $	Purchase only	$160-$240	$305-$345	$350-$600	Purchase only
Date of first U.S. delivery	June 1975	June 1975	June 1975	June 1970	1972
Number installed in U.S. to date	NA	300 (P300 Series)	300 (P300 Series)	2,000	15
COMMENTS	Same as pricing system with added capability for statements, invoices, & other management reports	Another 700 P300's installed worldwide	Another 700 P300's installed worldwide	Another 18,000 P350's installed worldwide	Marketing area is primarily in northeastern U.S.; turnkey system

*"Std." means the price of the "basic system" as listed here.

OCTOBER 1976

All About Small Business Computers

MANUFACTURER & MODEL	Programmed Control Corp. Prophet 21 Model 2	Qantel 800,900,950,1200	Qantel 1300	Q1 Corporation Q1/LMC	Randal Data Systems Link-100
DATA FORMATS					
Word length, bits	16	8	8	8-bit byte	16
Decimal digits per word	4	2	2	2 per byte	4
Bytes (characters) per word	2	1	1	1 per byte	2
Operand length, words	1	Variable	Variable	1, 2 bytes	Variable
Instruction length, words	1-3	3-10	3-10	1-3 bytes	1, 2, 3
CPU					
Model	TI 990/10	Qantel Q7	Qantel Q7.5	8080	Randal-100
Add time, microseconds	2.8 (word)	—	—	2	2.4
No. of programmable registers	16	17 in memory	6 + 17 in memory	7	4
No. of I/O ports on basic system and maximum	1, 128	6, 16	3, 16	11, 32	63 max.
INTERNAL STORAGE					
Type	MOS	MOS	MOS	MOS	MOS
Capacity of basic system, bytes	32K	32K	40K	8K	32K
Maximum capacity, bytes	2048K	32K-64K	128K	64K	64K
Increment size, bytes	8K	8K	8K	8, 16K	16K
Cycle time, microseconds	0.7	1.5	1.5	0.5	0.6
Access time, microseconds	—	—	—	0.3	0.3
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	No	Std.; 1.2M bytes	Std.; 2.5M bytes
Cartridge disk drive	Std.; 35M bytes	Std.; 24M bytes	Std.; 24M bytes	Opt.; 24M bytes	No
Pack disk drive	Opt.; 320M bytes	Opt.; 122.8M bytes	Opt.; 122.8M 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	No	Optional	Optional	No	Opt.; 300 cps
Paper tape punch	No	No	No	No	Opt.; 120 cps
Punched card reader	No	Opt.; 500 cpm	Opt.; 500 cpm	No	Opt.; 450 cpm
Punched card punch	No	No	No	No	No
Punched card reader/punch	No	No	No	No	No
Serial printer	Std.; 10 cps	Std.; 165 cps	Std.; 165 cps	Std.; 45-200 cps	Opt.; 30, 180 cps
Line printer	Opt.; 250 lpm	Opt.; 300-1200 lpm	Opt.;300-1200 lpm	Opt.; 300 lpm	Opt.; 300, 600 lpm
Reel-to-reel tape drive	No	Opt.; 20, 36 KBS	Opt.; 20, 36 KBS	No	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.	Optional; 24 x 72 char.	Optional; 24 x 72 char.	Standard; 6 x 40 char.	Standard; 12 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	—	6	32	8	8
Synchronous	No	Opt.; to 50K bps	Opt.; to 50K bps	Opt.; to 2400 bps	Opt.; 9600 bps
Asynchronous	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; 9600 bps
Protocols supported	None	IBM 2780	IBM 2780	IBM 3741	IBM 2780, Univac DCT 1000
SOFTWARE					
COBOL	No	No	No	No	No
RPG	No	No	No	No	No
FORTRAN	No	No	No	No	No
BASIC	No	No	No	No	Yes
Assembler	No	Yes	Yes	Yes	No
Other programming languages	Prophet 21	QIC (BASIC)	QIC (BASIC)	PL/1	—
Multiprogramming	Yes; 128 partitions	Yes; 5 partitions	Yes; 30 partitions	Yes	Yes; 2 partitions
Language implemented in firmware	No	Partially	Partially	Partially	No
Opersting system implemented in firmware	No	Partially	Partially	Fully	No; Timeshare OS
General accounting packages	Yes	Yes	Yes	Yes	Yes
Industry application areas	Dist., beverage mfg. & wholesaler	Whlsl./dist., medical clinics	Whlsl./dist., medical clinics	Acctg., credit union, word proc.	Lumber industry; med., dental mgmt.
Data base management system	Yes	No	No	Yes	No
File access methods supported	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential, index seq.	Random, sequential	Formatted, text, index seq., seq.
Software separately priced	No	Some	Some	No	Yes
Technical help separately priced	No	Yes	Yes	No	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$42,500	$32,000	$42,500	$17,950	$12,000
Monthly rental of basic system, $	Purchase only	Purchase only	Purchase only	Purchase only	$273
Date of first U.S. delivery	January 1977	1st quarter 1974	January 1976	1975	October 1975
Number installed in U.S. to date	NA	450	20	200	100
COMMENTS	Marketing area is primarily in northeastern U.S.; turnkey system	System capacities: 800 and 900, 32K only; 950, 40K-48K; 1200, 40K-64K		A 24 x 80 char. CRT is optionally available; up to 4 CRT/workstations per system	2 24 x 80 CRT's opt.; 630K-byte floppy std.; applications also in RJE, data entry, invent. ctl., text editing, comm'ns.

*"Std." means the price of the "basic system" as listed here.

All About Small Business Computers

MANUFACTURER & MODEL	Randal Data Systems Link-200	Randal Data Systems Link-310	Randal Data Systems Link-410	Raytheon PTS/1200	STC Systems Ultimacc 2000
DATA FORMATS					
Word length, bits	16	16	16	16	16
Decimal digits per word	4	4	4	2	4
Bytes (characters) per word	2	2	2	2	2, 3
Operand length, words	Variable	Variable	Variable	½, 1, 1½	½
Instruction length, words	1, 2, 3	1, 2, 3	1, 2, 3	1, 2	1
CPU					
Model	Randal-200	DG Nova 2/10	DG Nova 2/10	Raytheon PTS/1200	DG Nova 1200
Add time, microseconds	1.2	1.2	1.2	2.8 (1 word)	1.35
No. of programmable registers	4	4	4	4	4
No. of I/O ports on basic system and maximum	63 max.	63 max.	63 max.	42	20
INTERNAL STORAGE					
Type	MOS	Core	Core	MOS	Core
Capacity of basic system, bytes	32K	32K	32K	48K	32K
Maximum capacity, bytes	64K	64K	64K	128K	64K
Increment size, bytes	16K	16K	16K	16K	8K
Cycle time, microseconds	0.3	1.0	1.0	1.28	1.35
Access time, microseconds	0.3	0.5	0.5	0.80	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	No	No	No	No	Optional
Cartridge disk drive	Std.; 40M bytes	Std.; 23.2M bytes	Std.; 46.4M bytes	Std.; 20M bytes	Std.; 40M bytes
Pack disk drive	No	No	No	No	Opt.; 1200M 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	Optional	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	Opt.; 300 cps	Opt.; 300 cps	Opt.; 300 cps	No	Optional
Paper tape punch	Opt.; 120 cps	Opt.; 120 cps	Opt.; 120 cps	No	Optional
Punched card reader	Opt.; 450 cpm	Opt.; 450 cpm	Opt.; 450 cpm	Opt.; 300 cpm	Optional
Punched card punch	No	No	No	No	Optional
Punched card reader/punch	No	No	No	No	Optional
Serial printer	Opt.; 30, 180 cps	Opt.; 30, 180 cps	Opt.; 30, 180 cps	Opt.; 15-165 cps	Std.; 165 cps
Line printer	Opt.; 300, 600 lpm	Opt.; 300, 600 lpm	Opt.; 300, 600 lpm	Opt.; 300 lpm	Opt.; 300-600 lpm
Reel-to-reel tape drive	Opt.; 10-72 KBS	Opt.; 10-72 KBS	Opt.; 10-72 KBS	No	Opt.; 60 KBS
Cassette tape drive	No	No	No	Std.; 600 bytes/sec.	No
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.	Standard; 12 x 80 char.	Optional; 480 to 1920 char.	Standard; 27 x 74 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	8	8	8	1	—
Synchronous	Opt.; 9600 bps	Opt.; 9600 bps	Opt.; 9600 bps	Std.; to 9600 bps	Opt.; to 9600 bps
Asynchronous	Opt.; 9600 bps	Opt.; 9600 bps	Opt.; 9600 bps	Std.; to 9600 bps	Opt.; to 1200 bps
Protocols supported	IBM 2780, Univac DCT 1000	IBM 2780, Univac DCT 1000	IBM 2780, Univac DCT 1000	IBM 2780	None
SOFTWARE					
COBOL	No	No	No	No	Yes
RPG	No	No	No	No	No
FORTRAN	No	No	No	No	Yes
BASIC	Yes	Yes	Yes	No	Yes
Assembler	No	No	No	No	Yes
Other programming languages	None	None	None	MACROL	None
Multiprogramming	Yes; 16 partitions	Yes; 9 partitions	Yes; 9 partitions	Yes; 20 partitions	Yes; 8 partitions
Language implemented in firmware	No	No	No	No	No
Operating system implemented in firmware	No; Timeshare OS	No; Timeshare OS	No; Timeshare OS	No	No
General accounting packages	Yes	Yes	Yes	No	Yes
Industry application areas	Lumber industry; med, dental mgmt.	Lumber industry; med., dental mgmt.	Lumber industry; med., dental mgmt.	Transport., insurance, finance	Manuf., banking, gov't., dist. proc.
Data base management system	No	No	No	Yes	Yes
File access methods supported	Formatted, text, index seq.; seq.	Formatted, text, index seq., seq.	Formatted, text, index seq.; seq.	Random, sequential, index seq.	Direct, random, seq., index seq.
Software separately priced	Yes	Yes	Yes	No	No
Technical help separately priced	Yes	Yes	Yes	No	No
PRICING & AVAILABILITY					
Purchase price of basic system, $	$20,000	$33,500	$35,500	$30,580	$41,000
Monthly rental of basic system, $	$450	$762	$808	$830 (3-yr. lease)	Purchase only
Date of first U.S. delivery	August 1976	June 1974	June 1974	November 1974	NA
Number installed in U.S. to date	NA	50	50	50	NA
COMMENTS	16 24 x 80 CRT's opt.; 10M bytes disk std.; applications also in RJE, data entry, invent. ctl., text editing, comm'ns.	8 12/24 x 80 CRT's opt.; 5.8M bytes disk std.; applications also in inventory control	8 12/24 x 80 CRT's opt.; 11.6M bytes disk std.; applications also in inventory control	Display-oriented distributed system	Company formerly called Ultimacc Systems, Inc.; turnkey system

*"Std." means the price of the "basic system" as listed here.

All About Small Business Computers

MANUFACTURER & MODEL	STC Systems Ultimacc 3000	STC Systems Ultimacc 3370	Tal-Star TDMS System	Tri-Star Inc. TTK-10	Tri-Star Inc. TEK-80
DATA FORMATS					
Word length, bits	16	16	16	16	16
Decimal digits per word	4	4	4	4	4
Bytes (characters) per word	2, 3	2, 3	2	2	2
Operand length, words	½	½	1	1	1
Instruction length, words	1	1	1, 2	1	1
CPU					
Model	DG Nova 830	DG Nova 830	GA 18/30	Nova 3/12	Eclipse S/200
Add time, microseconds	1	1	2.4	6.8	6.6
No. of programmable registers	4	4	16	4	4
No. of I/O ports on basic system and maximum	60	60	—	4; 8	16; 64
INTERNAL STORAGE					
Type	Core	Core	Core	Core	Core
Capacity of basic system, bytes	32K	32K	32K	64K	128K
Maximum capacity, bytes	256K	256K	64K	64K	256K
Increment size, bytes	32K	32K	8, 16K	None	32K
Cycle time, microseconds	1	1	1.2	1	2
Access time, microseconds	—	—	—	0.5	1
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Optional	Optional	Opt.; 300K bytes	Optional	No
Cartridge disk drive	Std.; 40M bytes	No	No	Std.; 40M bytes	Opt.; 40M bytes
Pack disk drive	Opt.; 1200M bytes	Std.; 1200M bytes	Std.; 20M bytes	Opt.; 1200M bytes	Opt.; 1200M bytes
Fixed-head disk/drum	No	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Standard	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.; 400 cps	Optional	Optional
Paper tape punch	Optional	Optional	Opt.; 75 cps	Optional	Optional
Punched card reader	Optional	Optional	Std.; 400 cpm	Optional	Optional
Punched card punch	Optional	Optional	Opt.; 100 cpm	Optional	Optional
Punched card reader/punch	Optional	Optional	No	Optional	Optional
Serial printer	Opt.; 165 cps	Opt.; 165 cps	Std.; 10 cps	Optional	Optional
Line printer	Std.; 300-600 lpm	Std.; 600 lpm	Std.; 240 lpm	Std.; 200 lpm	Std.; 300-900 lpm
Reel-to-reel tape drive	Opt.; 60 KBS	Opt.; 60 KBS	Opt.; 20-60 KBS	Opt.; 40, 80 KBS	Std.; 40, 80 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; 27 x 74 char.	Standard; 27 x 74 char.	Optional; 27 x 74 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	—	—	15	64	64
Synchronous	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; to 9600 bps	Opt.; 9600 bps	Opt.; 9600 bps
Asynchronous	Opt.; to 1200 bps	Opt.; to 1200 bps	Std.; to 1200 bps	Opt.; 9600 bps	Opt.; 9600 bps
Protocols supported	None	None	None	IBM 2780	IBM 2780
SOFTWARE					
COBOL	Yes	Yes	Yes	Yes	Yes
RPG	No	No	Yes	No	No
FORTRAN	Yes	Yes	Yes	Yes	Yes
BASIC	Yes	Yes	No	Yes	Yes
Assembler	Yes	Yes	Yes	Yes	Yes
Other programming languages	None	None	None	None	None
Multiprogramming	Yes; 50 partitions	Yes; 50 partitions	Yes; 2 partitions	No	Yes; 2 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	Yes
Industry application areas	Manuf., banking, gov't., dist. proc.	Manuf., banking, gov't., dist. proc.	Graphic arts; newspapers	—	—
Data base management system	Yes	Yes	Yes	No	Yes
File access methods supported	Direct, random, seq., index seq.	Direct, random, seq., index seq.	Random, sequential, index seq.	Index sequential	Index sequential
Software separately priced	No	No	Yes	No	No
Technical help separately priced	No	No	Yes	Yes	Yes
PRICING & AVAILABILITY					
Purchase price of basic system, $	$62,000	$87,000	$73,600	$66,000	$167,930
Monthly rental of basic system, $	Purchase only	Purchase only	Purchase only	$1,518	$3,863
Date of first U.S. delivery	NA	NA	1972	May 1976	April 1975
Number installed in U.S. to date	NA	NA	NA	1	5
COMMENTS	Company formerly called Ultimacc Systems, Inc.; turnkey system	Company formerly called Ultimacc Systems, Inc.; turnkey system		Turnkey system with business, accounting, and inventory applications	Key-to-disk large data base management system

*"Std." means the price of the "basic system" as listed here.

All About Small Business Computers

MANUFACTURER & MODEL	Vanguard Computer Systems V500	Vanguard Computer Systems V400	Wang 2200S/2200T	Wang PCS	Wang WCS-10
DATA FORMATS					
Word length, bits	16	16	8-bit byte	8-bit byte	8-bit byte
Decimal digits per word	4	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 RDS 500	Raytheon RDS 500	Wang 2200S/T	Wang 2200	Wang 2200S
Add time, microseconds	1.4 (1 word)	1.8 (1 word)	800 (13 digits)	800 (13 digits)	800 (13 digits)
No. of programmable registers	8	8	None	None	None
No. of I/O ports on basic system and maximum	24; 40	24	3, 9	4	3, 9
INTERNAL STORAGE					
Type	Core	Core	MOS	MOS	MOS
Capacity of basic system, byte	65K	65K	4K	8K	8K
Maximum capacity, bytes	131K	65K	32K	32K	32K
Increment size, bytes	32K	—	4, 8K	8K	8K
Cycle time, microseconds	0.7	0.9	1.6	1.6	1.6
Access time, microseconds	0.35	0.45	—	—	—
MASS STORAGE CAPABILITIES*					
Floppy disk drive	Optional	No	Opt.; 786K bytes	No	No
Cartridge disk drive	Opt.; 40M bytes	Std.; 40M bytes	Opt.; 20M bytes	No	No
Pack disk drive	Std.;320-3200M by.	No	No	No	No
Fixed-head disk/drum	Optional	No	No	No	No
KEYBOARD INPUT*					
Alphanumeric (typewriter) keyboard	Standard	Standard	Optional	Standard	Standard
10-key numeric keyboard	Optional	Optional	Optional	Standard	Standard
Full accounting keyboard	No	No	No	No	No
INPUT/OUTPUT DEVICES*					
Paper tape reader	0	No	Opt.; 300 cps	No	Opt.; 300 cps
Paper tape punch	0	No	Opt.; 50 cps	No	Opt.; 50 cps
Punched card reader	Opt.;300,1000 cpm	No	Opt.; 300 cpm	No	Opt.; 300 cpm
Punched card punch	0	No	Opt.; 45 cpm	No	Opt.; 45 cpm
Punched card reader/punch	No	No	No	No	No
Serial printer	Std.; 30, 330 cps	Std.; 330 cps	Opt.; 200 cps	Opt.; 200 cps	Opt.; 120 cps
Line printer	Std.; 300,1250 lpm	No	Opt.; 250 lpm	Opt.; 250 lpm	Opt.; 250 lpm
Reel-to-reel tape drive	Opt.; 30-200 KBS	No	Opt.; 10 KBS	No	Opt.; 10 KBS
Cassette tape drive	No	No	Opt.; 326 bps	Std.; 326 bps	Std.; 326 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; 16 x 64 char.
COMMUNICATIONS CAPABILITIES*					
Maximum no. of lines	64	None	1	1	1
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	None	None	IBM 2780/3780, 2741, 3741	IBM 2780/3780, 2741, 3741	IBM 2780/3780, 2741, 3741
SOFTWARE					
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	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	Avail. Jan. 1977	Avail. Jan 1977	Manuf., dist., insur., banking	Educ., laboratory, engineering, mfg.	Manuf., dist., insur., banking
Data base management system	Yes	No	No	No	No
File access methods supported	Direct, sequential linked, index seq.	Direct, sequential, linked, index seq.	Random, sequential, index seq.	Sequential	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	$45,000	$2,400/$4,000	$5,400	$6,100
Monthly rental of basic system, $	NA-	NA	Purchase only	Purchase only	$207.40 (5-yr. lease)
Date of first U.S. delivery	March 1976	NA	January 1975	April 1975	April 1975
Number installed in U.S. to date	2	NA	NA	NA	NA
COMMENTS	Terminal-oriented system; 10M bytes cartridge disk, two 30-cps printers, & 6 CRT's std.; 32 CRT's optional	10M bytes cartridge disk std.; up to 6 terminal devices allowed; up to 3 serial printers opt.	2200S requires options for high-speed I/O and disk capabilities; can be upgraded to 2200T status	Portable computer weighing 57 lbs.	Packaged system includes 8K 2200S, CRT/keyboard, & cassette drive

*"Std." means the price of the "basic system" as listed here.

All About Small Business Computers

MANUFACTURER AND MODEL	Wang WCS-20	Wang WCS-30	Warrex Computer Centurion I-A	Warrex Computer Centurion II
DATA FORMATS				
Word length, bits	8-bit byte	8-bit byte	16	16
Decimal digits per word	1 per byte	1 per byte	2	2
Bytes (characters) per word	1 per byte	1 per byte	2	2
Operand length, words	1 byte	1 byte	½, 1	½, 1
Instruction length, words	1 byte	1 byte	½, 1, 1½	½, 1, 1½
CPU				
Model	Wang 2200T	Wang 2200T	Centurion CC-204	Centurion CC-202
Add time, microseconds	800 (13 digits)	800 (13 digits)	—	—
No. of programmable registers	None	None	8	8
No. of I/O ports on basic system and maximum	3, 9	3, 9	4, 25	3, 4
INTERNAL STORAGE				
Type	MOS	MOS	MOS	MOS
Capacity of basic system, bytes	8K	16K	24K	16K
Maximum capacity, bytes	32K	32K	60K	16K
Increment size, bytes	8K	8K	8K, 16K	None
Cycle time, microseconds	1.6	1.6	0.800	0.800
Access time, microseconds	—	—	—	—
MASS STORAGE CAPABILITIES*				
Floppy disk drive	Std.; 786K bytes	Std.; 786K bytes	Std.; 1.2M bytes	No
Cartridge disk drive	Opt.; 20M bytes	Std.; 20M bytes	Opt.; 41.6M bytes	Std.; 41.6M bytes
Pack disk drive	No	No	No	No
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.; 300 cps	Opt.; 300 cps	Opt.; 50 cps	Opt.; 50 cps
Paper tape punch	Opt.; 50 cps	Opt.; 50 cps	No	No
Punched card reader	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm	Opt.; 300 cpm
Punched card punch	Opt.; 45 cpm	Opt.; 45 cpm	No	No
Punched card reader/punch	No	No	No	No
Serial printer	Opt.; 200 cps	Std.; 200 cps	Std.; 175 cps	Std.; 175 cps
Line printer	Opt.; 250 lpm	Opt.; 250 lpm	Opt.; 125-600 lpm	Opt.; 125-600 lpm
Reel-to-reel tape drive	Opt.; 10 kbs	Opt.; 10 kbs	Optional	No
Cassette tape drive	Opt.; 326 cps	Opt.; 326 cps	Opt.; 200 cps	Opt.; 200 cps
Cartridge tape drive	No	No	No	No
Magnetic ledger card device	No	No	No	No
CRT	Standard; 16 x 64 char.	Standard; 16 x 64 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.
COMMUNICATIONS CAPABILITIES*				
Maximum no. of lines	1	1	8	1
Synchronous	Opt.; to 4800 bps	Opt.; to 4800 bps	No	No
Asynchronous	Opt.; to 9600 bps	Opt.; to 9600 bps	Standard	Optional
Protocols supported	IBM 2780/3780, 2741, 3741	IBM 2780/3780, 2741, 3741	None	None
SOFTWARE SUPPORT				
COBOL	No	No	No	No
RPG	No	No	No	No
FORTRAN	No	No	Yes	Yes
BASIC	Yes	Yes	Yes	Yes
Assembler	No	No	Yes	Yes
Other programming languages	None	None	CPL 1	CPL 1
Multiprogramming	No	No	Yes	No
Language implemented in firmware	Fully	Fully	No	No
Operating system implemented in	Partially	Partially	No	No
General accounting packages	Yes	Yes	Yes	Yes
Industry application areas	Manuf., dist., insur., banking	Manuf., dist., insur., banking	Oil/gas, medical acctg., dist., banking	Accounting, distribution
Data base management system	Yes	Yes	Yes	No
File access methods supported	Random, sequential, index seq.	Random, sequential, index seq.	Random	Sequential
Software separately priced	Yes	Yes	Some	Some
Technical help separately priced	No	No	Yes	Yes
PRICING AND AVAILABILITY				
Purchase price of basic system, $	$11,200	$30,400	Under $20,000	$26,950
Monthly rental of basic system, $	$380.80 (5-yr. lease)	$1,033.60 (5-yr. lease)	Purchase only	Purchase only
Date of first U.S. delivery	April 1975	April 1975	2nd quarter 1977	1975
Number installed in U.S. to date	NA	NA	NA	5
COMMENTS	Packaged system includes 8K 2200T, CRT/keyboard, and 262K-byte floppy disk drive	Packaged system includes 16K 2200T, CRT/keyboard, 262K-byte floppy disk drive, and 200-cps printer	Each floppy disk drive holds 616K bytes; each cartridge disk drive holds 10.4M bytes	

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

All About Small Business Computers

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	16	16	16	8
Decimal digits per word	2	2	2	1 or 2
Bytes (characters) per word	2	2	2	1
Operand length, words	½, 1	½, 1	½, 1	1, 2, or variable
Instruction length, words	½, 1, 1½	½, 1, 1½	½, 1, 1½	1-6
CPU				
Model	Centurion CC-203	Centurion CC-204	Centurion CC-206	Wintex µproc
Add time, microseconds	—	—	—	1.5 millisec.
No. of programmable registers	8	8	8	Unlimited in memory
No. of I/O ports on basic system and maximum	4, 12	4, 25	4, 100	256
INTERNAL STORAGE				
Type	MOS	MOS	MOS	MOS
Capacity of basic system, bytes	32K	32K	32K	8K
Maximum capacity, bytes	60K	60K	252K	64K
Increment size, bytes	16K, 32K	16K, 32K	16K, 32K	4K
Cycle time, microseconds	0.800	0.800	0.800	0.65
Access time, microseconds	—	—	—	—
MASS STORAGE CAPABILITIES*				
Floppy disk drive	No	No	No	Std.; 1.2M bytes
Cartridge disk drive	Std.; 41.6M bytes	Std.; 41.6M bytes	Std.; 77.6M bytes	Opt.; 10-40M bytes
Pack disk drive	No	No	No	Opt.
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.; 50 cps	Opt.; 50 cps	Opt.; 50 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	Std.; 175 cps	Std.; 175 cps	Std.; 175 cps	No
Line printer	Opt.; 125-600 lpm	Opt.; 125-600 lpm	Opt.; 125-600 lpm	Std.; 66 lpm
Reel-to-reel tape drive	Optional	Optional	Optional	No
Cassette tape drive	Opt.; 200 cps	Opt.; 200 cps	Opt.; 200 cps	No
Cartridge tape drive	No	No	No	No
Magnetic ledger card device	No	No	No	No
CRT	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 24 x 80 char.	Standard; 27 x 40 char.
COMMUNICATIONS CAPABILITIES*				
Maximum no. of lines	8	8	8	1
Synchronous	No	No	No	Under development
Asynchronous	Standard	Standard	Standard	Opt.; to 9600 bps
Protocols supported	None	None	None	None
SOFTWARE SUPPORT				
COBOL	No	No	No	No
RPG	No	No	No	No
FORTRAN	Yes	Yes	Yes	No
BASIC	Yes	Yes	Yes	Under development
Assembler	Yes	Yes	Yes	Yes
Other programming languages	CPL 1	CPL 1	CPL 1, CPL 2	None
Multiprogramming	Yes	Yes	Yes	Under development
Language implemented in firmware	No	No	Yes	Fully; assembler
Operating system implemented in firmware	No	No	Yes	Partially
General accounting packages	Yes	Yes	Yes	Yes
Industry application areas	Oil/gas, medical, acctg., dist., banking	Oil/gas, medical, acctg., dist., banking	Oil/gas, medical, acctg., dist., banking	Distribution, professional serv.
Data base management system	Yes	Yes	Yes	No
File access methods supported	Random, sequential	Random	Random	Key seq., sequential, index seq.
Software separately priced	Some	Some	Some	Yes
Technical help separately priced	Yes	Yes	Yes	Some
PRICING & AVAILABILITY				
Purchase price of basic system, $	$31,950	$34,150	NA	$11,880
Monthly rental of basic system, $	Purchase only	Purchase only	Purchase only	$280 (5-yr. lease)
Date of first U.S. delivery	1974	1975	4th quarter 1976	January 1975
Number installed in U.S. to date	90	10	NA	NA
COMMENTS				Two 600K-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.