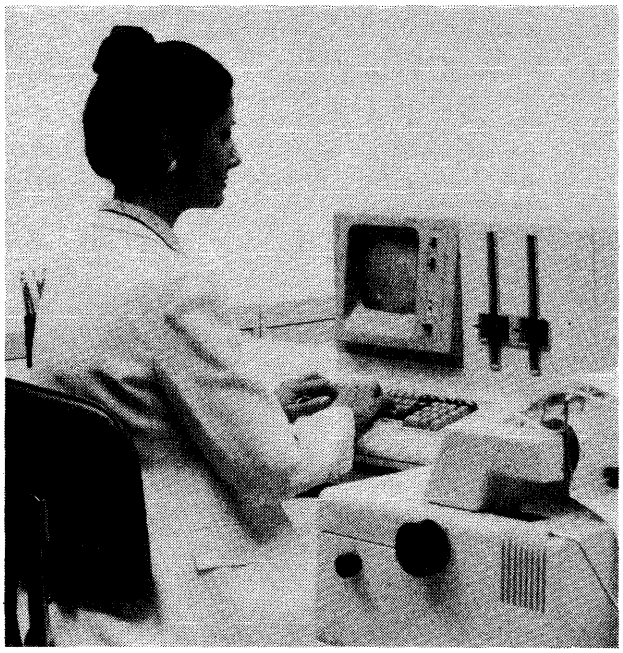
IBM 5120 Computing System



A typical IBM 5120 system, as shown above, features an integrated CRT display, two integrated floppy disk drives, and an attached typewriter-style keyboard. The 5103 Printer, seen in the foreground, is available as an option. System purchase prices range from $5,680 (with Basic interpreter) to $9,115 (with Basic/APL interpreters).

MANAGEMENT SUMMARY

With the introduction of the System/23 Datamaster, it was speculated that IBM was phasing out the 5120 Computing System. Compared to the 5120, the Datamaster offers twice the main memory capacity (128K bytes), a larger diskette storage capacity (6.6M bytes), and can accommodate *two* serial printers ranging in speeds from 40 cps to 160 cps. However, the 5120 offers two language interpreters, Basic and/or APL. Because of the system's dual-interpreter capability, IBM is continuing its marketing efforts for the 5120. IBM may one day add to Datamaster's Basic interpreter version to include APL or other languages, but until that day comes, the IBM 5120 Computing System is still a viable product in the vendor's line of small systems.

The 5120, like its predecessor the 5110, is suitable for a wide range of commercial and problem-solving applications in both small and large organizations. For small businesses, the system can be programmed in Basic to handle the typical commercial applications such as payroll, accounts receivable, and general ledger. In larger companies, the 5120 can serve both as a local data processing or problem-solving system and as a communications terminal linked to a larger host computer. In organizations of all sizes, the 5120's ease of use and interactive APL language implementation make it an effective "personal" computer for the problem-solving ➢

Despite the announcement of IBM's System/23 Datamaster, the 5120 has been spared in the vendor's marketing scheme. The 5120 includes from 16K to 64K bytes of memory, dual diskette drives, and integrated CRT display, and Basic and/or APL interpreters. Either one of two serial printers and a free-standing, dual-diskette drive are optionally available.

MAIN MEMORY: 16K to 64K bytes
DISKETTE CAPACITY: 4.8M bytes (with the free-standing diskette drives)
WORKSTATIONS: A single-station system
PRINTERS: 80 cps to 120 cps
OTHER I/O: RS-232-C-compatible devices

CHARACTERISTICS

MANUFACTURER: IBM Corporation, National Marketing Division, 4111 Northside Parkway N.W., P.O. Box 2150, Atlanta, Georgia 30327.

MODEL: IBM 5120 Computing System.

DATE ANNOUNCED: February 5, 1980.

DATE OF FIRST DELIVERY: February 1980 for the 32K Basic model; March 1980 for all other models.

DATA FORMATS

All access to the 5110 is through the Basic or APL programming language, implemented in read-only memory. In general, these languages provide specific facilities for numeric integers, floating-point numeric values, numeric arrays, and alphanumeric strings. Internal data representation is binary floating point. Instruction formats are, in effect, the Basic or APL statements themselves.

MAIN STORAGE

TYPE: MOSFET (Metal-Oxide Semiconductor Field Effect Transistor).

CYCLE TIME: 530 nanoseconds per two-byte access.

CAPACITY: 16,384, 32,768, 49,152, or 65,536 bytes.

CHECKING: A parity bit is associated with each byte.

RESERVED STORAGE: A total of 4,624 bytes of main memory is reserved for the Basic interpreter in addition to the read-only memory; for APL, a total of 6,915 bytes is reserved.

CENTRAL PROCESSOR

The IBM 5120 is program-compatible with, and equal in performance to, similarly configured versions of the older IBM 5110 Computing System (Report M11-491-251).

The central component of the 5120 Computing System is the desktop 5110 Model 3 Computer, which contains an integrated 9-inch, 1024-character CRT display, a typewriter- ➢

IBM 5120 Computing System

requirements of engineers, scientists, actuaries, financial analysts, and other professionals.

The central component of the 5120 Computing System is the 5110 Model 3 Computer; a compact, desktop unit that contains a typewriter-style keyboard, a 9-inch CRT display, two diskette drives, a Basic and/or APL language intrpreter implemented in read-only storage, and from 16K to 64K bytes of MOSFET main memory with a 530-nanosecond cycle time. The 9-inch display screen has the same 1024-character capacity as the smaller screen used on earlier models of the 5110, but yields greatly improved readability. The dual integrated diskette drives provide up to 2.4 megabytes of on-line storage and permit major reductions in both the physical size and price of a diskette-oriented system. (In the 5110 system, diskette drives are housed in a separate cabinet that is much larger and heavier than the computer itself.)

The basic 5120 system can be expanded by attaching one 5103 Printer and/or one 5114 Diskette Unit to the 5110 Model 3 Computer. The 5103 is a bidirectional serial matrix printer, available in two models with rated speeds of 80 and 120 characters per second. The 5114 contains either one or two diskette drives and increases the system's diskette storage capacity to a maximum of 4.8 megabytes.

Standard features of the 5120 include a Composite Video Adapter, which provides for simultaneous display of the CRT data on additional screens, and an Audible Alarm, which can be programmed to signal error conditions or job completion.

Optional features include a Diskette Sort Feature, a Serial I/O Adapter, and two data communications adapters. The Diskette Sort Feature is implemented in read-only storage and provides for either full-record or record-address sorting of diskette data files. The Serial I/O Adapter permits direct connection of one non-standard peripheral device with an RS-232-C interface. The Asynchronous Communications Adapter enables the 5120 to function as a dedicated terminal that appears to the host computer as an IBM 2741 typewriter terminal transmitting at either 134.5 or 300 bps. The Binary Synchronous Communications Adapter enables the 5120 to function as a BSC terminal emulating either the IBM 2770 or 3741 line protocol at transmission speeds of up to 4800 bps.

In addition to the diskette-based software previously available for the 5110, IBM also offers six cross-industry accounting application packages: Billing, Payroll, Accounts Payable, Accounts Receivable, Inventory Reporting, and General Ledger. Each of the six applications packages is available for a $76 monthly license charge, which is paid up after 24 months.

IBM's Atlanta-based Installation Support Center will assist customers, by means of a toll-free "hot line" telephone number, in installing their 5120 Computing Systems and the new application packages.

style keyboard, and two diskette drives. The 5110 Model 3 is available in 12 submodels offering a choice of the Basic and/or APL languages and four main memory capacities: 16K, 32K, 48K, or 64K bytes.

The internal structure of the 5110 Model 3 Computer has not been detailed publicly. It is based on a single microprocessor-based card, said to be the same one used in the original IBM 5110 Computing System.

The instruction repertoire is effectively that of the Basic and/or APL language. These high-level languages permit symbolic addressing of data values, loop control, and program flow structuring, along with procedure-oriented facilities for numeric computations. Alphanumeric strings can be handled for the displaying or printing of table heads, interactive prompting, error or condition displays, etc.

Each 5110 Model 3 Computer includes a 1024-character display and a keyboard. The keyboard keytops are engraved with symbols corresponding to the elements of the language implemented in each model. For Basic models, most of the language statement keywords can be enterd with a single key depression in conjunction with the Command key. Also on Basic models, the accompanying 10-key numeric keypad can be used as function keys, with the meanings defined by user programming. On both Basic and APL models, the top row of keys carries alternate usages for various system and peripheral functions.

The Basic and APL interpreters are implemented in read-only memory, or, as IBM refers to it, read-only storage (ROS). ROS is implemented in MOSFET technology for the 5110 Model 3, with 72K- and 96K-bit chips. Also included in ROS are system control functions and I/O drivers.

Standard features of the 5110 Model 3 Computer include an Audible Alarm, which can be programmed to signal error conditions or the completion of jobs, and a Composite Video Adapter, which provides for simultaneous display of the CRT data on additional screens.

The optional Diskette Sort Feature resides in read-only storage and provides for either full-record or record-address sorting of diskette data files. The sorts can be invoked from either Basic or APL programs, and the sort keys can contain up to six control fields. Control statements can be either stored on diskette or entered from the keyboard in response to prompting messages.

PHYSICAL SPECIFICATIONS: The 5110 Model 3 Computer is 23 inches (58.4 cm) wide, 21 inches (53.3 cm) deep, and 16 inches (40.6 cm) high. It weighs 106 pounds (48 kg), and uses standard 120-VAC, 1-phase, 60-Hz power.

The 5103 Model 11 or 12 Printer is 24 inches (60 cm) wide, 14.5 inches (31 cm) deep, and 12 inches (30 cm) high. It weighs 55 pounds (25 kg).

The 5114 Diskette Unit is 17.75 inches (44 cm) wide, 22.25 inches (55 cm) deep, and 29 inches (72 cm) high. It weighs from 120 to 136 pounds (54 to 62 kg).

CONFIGURATION RULES

The 5110 Model 3 Computer, the central unit of every 5120 Computing System, is a desktop computer that contains a CRT display, keyboard, two diskette drives, a Basic and/or APL language interpreter in read-only storage, and 16K, 32K, 48K, or 64K bytes of main memory.

The 5110 Model 3 can function as a standalone computer, or the system can be expanded through the addition of one 5103 Printer and/or one 5114 Diskette Unit. The 5103 Printer is available in two models with rated speeds of 80

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PERIPHERALS/TERMINALS

MODEL	DESCRIPTION & SPEED
INTEGRAL WITH PROCESSOR	
Display	9-inch diagonal CRT screen displays 1024 characters in 16 lines of 64 characters each; displays upper and lower case characters, including all Basic and APL characters; programmable full screen management, including automatic cursor positioning and CRT on/off control; black-on-white or reverse display, switch-selected; spread-out of left or right 32-character half line, switch-selected
Keyboard	Typewriter-style keyboard plus separate numeric pad; keytops indicate special Basic and/or APL characters, depending on the model; key fronts indicate command keywords; numeric pad includes four arithmetic operator keys for convenient data entry in desk calculator mode
Diskette drives	See MASS STORAGE section of this report
PRINTERS	
5103 Model 11	80-cps Printer; prints serially in both left-to-right and right-to-left directions, using an impact matrix printing technique; prints upper and lower case characters, including all Basic and APL special characters; 132 print positions; 10 characters/inch; 6 lines/inch; handles multi-part, fan-folded paper from 3½ to 15 inches in width and from 3 to 14 inches in fold-to-fold length
5103 Model 12	Same as above, except speed is 120 characters/second
OTHER DEVICES	
RS-232-C peripherals	6301 Serial I/O Adapter; optional feature; provides an RS-232-C interface for direct connection of peripheral devices that communicate in 5-, 6-, 7-, or 8-bit code at speeds of 20 to 9600 bits/second (2400-bps maximum for 5-bit code)
Additional CRT screens	Composite Video Adapter; standard feature; permits simultaneous display of CRT data on additional screens
Communications adapters	See COMMUNICATIONS CONTROL section of this report

The 5120 is available in 12 processor models that offer a choice of the Basic and/or APL languages and four main memory capacities: 16K, 32K, 48K, and 64K bytes. System purchase prices range from $5,860 to $10,155. A representative configuration with the Basic language interpreter, 32K bytes of main memory, and a 120-cps printer can be purchased for $8,695.

The 5120 is offered as a purchase-only machine with an optional purchase pilot test plan. The test plan enables the user to rent the system for three months and credit up to 70 percent of his rental payments against the purchase price. The test period can be extended for up to six additional months.

The 5120 is marketed by IBM Business Computer Centers across the U.S., as well as by the marketing division's national network of sales branch offices. The Business Computer Centers are facilities designed specifically to market computer systems to small businesses and to provide education and follow-up support.□

and 120 characters per second, and the 5114 Diskette Unit is available with either one or two drives. (If the 5103 Printer is *not* used in a system, the 5110 Model 3 must be equipped with the Channel Terminator feature, which logically and physically provides load termination to the computer's I/O channel.)

The optional Serial I/O Adapter provides an RS-232-C interface on the 5110 Model 3 that permits direct connection of any one of a variety of peripheral devices that satisfy the EIA Standard RS-232-C specifications. Interaction with the attached device is through customer-supplied APL or Basic programs, and data can be transferred in 5-, 6-, 7-, or 8-bit code at a speed of 20 to 9600 bits per second (2400 bps maximum for 5-bit code). No IBM software support for specific devices is currently offered. The Serial I/O Adapter may not be installed with the Asynchronous Communications Adapter if the Binary Synchronous Communications Adapter is also installed. The Expansion Feature is a prerequisite for installation of the Serial I/O Adapter.

The 5120 Computing System can be equipped to operate as a communications terminal by installing the Asynchronous Communications Adapter and/or the Binary Synchronous Communications Adapter, as described in the COMMUNICATIONS CONTROL section of this report.

MASS STORAGE

INTEGRATED DISKETTE DRIVES: The 5110 Model 3 Computer contains two integrated diskette drives with a maximum on-line storage capacity of 1.2 million bytes each. IBM has not disclosed the functional specifications of the integrated diskette drives to date, but they are believed to be similar to those of the 5114 Diskette Unit described below.

5114 DISKETTE UNIT: A free-standing unit that contains one or two diskette drives, each with a maximum on-line storage capacity of 1.2 million bytes. The 5114 connects to the 5110 Model 3 Computer and augments the two integrated diskette drives, providing a maximum of four drives and 4.8 million bytes of diskette storage for the system. The 5114 supports multiple open files (up to 10) and provides a media exchange capability with other diskette devices that conform

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to basic interchange specifications. Average access time is 243 milliseconds, including rotational delay but excluding head loading time. Rotational speed is 360 rpm. IBM diskette types 1, 2, and 2D can be initialized and used to READ/WRITE data and to LOAD/SAVE programs and data. The specifications of the three types of diskettes are as follows:

Diskette Type	Maximum Capacity, bytes	Data Transfer Rate, bytes/second
1	306,000	31,300
2	606,000	31,300
2D	1,212,000	62,500

INPUT/OUTPUT UNITS

See the PERIPHERALS/TERMINALS table on M11-491-203.

COMMUNICATIONS CONTROL

ASYNCHRONOUS COMMUNICATIONS ADAPTER: Permits the 5120 to communicate with a remote IBM or other computer. The 5120 appears as an IBM 2741 typewriter terminal (using EBCDIC or Correspondence Code) to the remote system. Data is transmitted in half-duplex, asynchronous, start/stop mode at a speed of 134.5 or 300 bits per second over appropriate B1, B2, C1, C2, or D1 facilities. Line connection is via a customer-supplied modem.

The 5120 in asynchronous mode can be connected to an IBM System/370, 303X, or 4300 Series computer via an Integrated Communications Adapter or a 3704 or 3705 Communications Controller with the Emulation Program (EP/VS) or the Network Control Program (NCP/VS). Host-system software support for the 5120 operating as a 2741 is provided by OS/VS1 or OS/VS2 with BTAM, TCAM, or VTAM; by DOS/VS with VTAM; and by VM/370.

While operating in the asynchronous communications mode, the 5120 is a dedicated terminal device; user programs cannot be entered or executed. The 5120's keyboard is used in the same way as a 2741 keyboard. Output is displayed on the CRT and can also be printed on the optional 5103 Printer. Data can also be transmitted from and received on diskettes.

The Asynchronous Communications Adapter may not be installed with the Serial I/O Adapter if the Binary Synchronous Communications Adapter is also installed. The Expansion Feature is a prerequisite.

BINARY SYNCHRONOUS COMMUNICATIONS ADAPTER (BSCA): Equips the 5120, through either Basic or APL program control, to function on a switched or non-switched (leased or private) communications line as a processor terminal emulating either the IBM 2770 or 3741 line protocol at a transmission speed of 600 to 4800 bits per second. A 5120 emulating the 2770 line protocol can communicate with an IBM System/370, 303X, or 4300 Series computer supported by OS/VS1, OS/VS2, TCAM, DOS/VS BTAM via an Integrated Communications Adapter, or a 3704 or 3705 Communications Controller with NCP or EP. A 5120 emulating the 3741 line protocol can communicate with any of the following:

- A 5110 or another 5120 equipped with the BSCA.
- A 3741 Model 2 or 4.
- A System/3, System/32, System/34, or System/38 equipped with the appropriate communications adapter.

The BSCA will operate with any of the above systems capable of communicating over a point-to-point (non-switched) data link at 1200/600, 2000, 2400, or 4800 bps. The 5120 can also operate as a BSC tributary station on a multipoint (leased or private) line in conjunction with a System/370, 303X, or 4300 control station at 1200 to 4800 bps.

The BSCA operates in half-duplex mode, and its operation is overlapped with that of the 5103 Printer. The adapter supports transmission and reception of blocked records. Switched-network versions also support manual dialing and manual- or auto-answering (where the attached modem supports the latter capability). The BSCA can be configured to use EBCDIC or the EBCDIC Transparency Code. An Internal Clock generates synchronizing and timing signals when these are not provided by the attached modem.

The EIA/CCITT Interface is a required feature when the BSCA is installed. It provides a cable and interface for attachment of either an IBM or non-IBM modem that meets the RS-232-C specifications. IBM modems that can be used with the BSCA include the 2400-bps 3863 and 3872, and the 4800-bps 3864 and 3874.

SOFTWARE

OPERATING SYSTEM: The 5120 does not have an operating system in the usual sense of the word. Its system control functions are integrated into the read-only storage (ROS) module, with some main memory space required for symbol tables, etc. System control functions are primarily concerned with coordinating the interface between the user programs and the language interpreters and peripheral devices.

In effect, there are three modes of usage: program development, interactive program writing with execution, and interactive execution of a previously written and stored program. Depending on the computer model, the programming language may be Basic, APL, or both. In the combination Basic/APL models, a switch allows user selection of the language to be used.

PROGRAMMING LANGUAGES: *Basic* for the 5120 supports stream data files and matrix (two-dimensional array) operations. Independent output to the printer of data displayed on the built-in CRT is supported. Basic includes capabilities for manipulating alphanumeric strings. Other features of the 5120 Basic language include an Indexed File Access Method and an update-in-place capability for diskette data files, dynamic print formatting, and an ascending/ descending index sort capability. The statements use English-like forms, so Basic is the logical choice for first-time computer users and is recommended by IBM for commercial applications on the 5120. In addition to ROS, the Basic interpreter uses 4,624 bytes of main memory, which is not available to the user.

APL for the 5120 is an implementation of the APL/SV language (Release 3.0) that supports arrays of up to 63 dimensions, as well as comprehensive mathematical, logical, and relational operators and functions. Independent output to the printer of data displayed on the built-in CRT is also supported. APL language extensions for the 5120 include additional system commands for diskette input/output, multiple-record reading and writing, and printer left margin control. APL is the logical choice if complex mathematical or logical operations are required. In addition to ROS, the APL interpreter uses 6,915 bytes of main memory, which is not available to the user.

UTILITY PROGRAMS: Four "Problem Solver Libraries" are currently supported by IBM for the 5120 Computing System. Each library consists of a series of programs designed to facilitate the system's use in a specific class of applications. The Print Plot Library is available for both

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Basic- and APL-oriented systems, while the other three libraries are offered only in Basic versions.

The *Business Analysis/Basic Problem Solver Library* includes 30 Basic routines specifically oriented to problems in spread sheet, investment, depreciation, break-even, and time series analysis. The spread sheet analysis is a general report preparation tool that permits tabular presentation of data with line arithmetic (e.g., multiply line 2 by line 3) and cumulative column presentations. Data values can be entered from the keyboard or from a previously recorded magnetic tape cartridge file. Some routines allow the user to insert his own algorithm if the standard facilities provided do not include the operation he needs. The investment analysis series of programs permits computation of return on investment, discount cash flow analysis, multiple- and single-loan analysis, lease versus purchase analysis, and make versus buy analysis. Included in the depreciation analysis series of programs are straight line, sum-of-years digits, declining balance, and equipment units methods. The break-even or cost/volume profit analysis series permits computation with definite probablistic assumptions. The time series analysis group of programs provides a wide range of computational capabilities for time-oriented data for compound growth rate projection, moving average, and seasonal or cyclical analysis, as well as for simple statistical problems such as auto or cross covariance and correlation, exponential smoothing, and simple regression.

Generalized routines also provided in this library permit a user to construct and display histograms, create and update user files, resequence or rearrange records in files, and print data files. A 32K-byte Basic system is required. The optional printer is recommended for the spread sheet analysis program group.

The *Math/Basic Problem Solver Library* includes a comprehensive set of numerical analysis routines. The facilities provided can be broadly grouped into calculus, including integration, differentiation, and solution of ordinary differential equations; linear equations and matrix analysis, including eigenproblems, least squares solutions, linear programming, and solution of linear equations; approximations to functions and zeroes of functions, including several interpolation and approximation methods, function smoothing, minimums and maximums of tabulated functions, etc.; and evaluations of advanced mathematical functions such as the Gamma function, Bessel and modified Bessel functions, elliptic integrals and functions, orthogonal polynomials, etc.

Thirty of the 42 Math/Basic routines will operate on a minimum 16K-byte Basic system. The other 12 routines require a 32K-byte machine.

The *STAT/Basic Problem Solver Library* includes 41 routines for the analysis of numerical data through commonly used statistical techniques. The routines can be broadly grouped into elementary statistics, including histogram, cross-tabulation, moment, tally, and Chi-square and T test; regression and correlation analysis, including simple, stepwise, multiple, and polynomial regression; multivariate analysis, including discriminant analysis, canonical correlation, and factor analysis; analysis of variance; time series analysis, including moving average, seasonal and cyclical analysis, auto and cross covariance and correlation, and triple exponential smoothing; non-parametric statistics; and biostatistics, including survival rate and profit analysis. Four routines in the library provide capabilities to enter and display/print, correct, modify, generate, or smooth data.

The STAT/Basic routines can be used on a minimum 16K-byte Basic system. The routines adjust automatically to utilize various storage capacities and I/O options.

The *Print Plot/Problem Solver Library* includes a series of modules that provide a wide range of plotting capabilities and can utilize data received from a Basic program, from an APL program, or directly from a keyboard. With the addition of a Serial I/O Adapter, the 5120 can utilize an absolute vector plotter or a storage display terminal. The program provides the capability for generating line graphs, bar charts, histograms, point plotting, and others. The user specifies metric or inch plotting, the size and location of the graph within the plot limits, the location of the origin within the graph, the X and Y values at the origin, horizontal and vertical scaling factors (either linear or logarithmic), automatic axes, automatic grids, horizontal and vertical dot density, special symbols, and any data files that are used in conjunction with program-generated and keyboard data. The platen of the 5103 Printer is reversible so that the paper can be moved backward as well as forward.

Print Plot/Basic requires a 32K-byte Basic system, while Print Plot/APL requires a 32K-byte APL system.

BRADS II (Business Report/Application Development System II) is a field-developed data management system that enables non-programmers to define and create files, maintain the files, build file inquiries, and generate reports from the file data. Thus, BRADS II enables users with no knowledge of Basic programming to develop simple applications such as asset inventories, company telephone directories, price lists, mailing lists, and bills of materials. Users with Basic programming experience can use BRADS II to facilitate the development of more complex applications.

The *BRADS II/Spread Sheet Generator (SPREAD)* extends BRADS II's applicability to a wide range of financial and business planning and management reporting operations. SPREAD adds "row and column" data generation and manipulation facilities to BRADS II's data base and report generation facilities to ease the preparation of "spread sheet" reports and various derivatives of these reports. Its use is recommended for applications such as balance sheets, budget planning and forecasting, cash requirements and forecasting, commercial loan evaluation, comparative analysis, investment analysis, material and labor requirements, and product planning.

The minimum equipment requirement for both BRADS II and SPREAD is a 5120 Computing System with a 5110 Model B32 Computer (32K-byte Basic), the Diskette Sort feature, and a 5103 Model 11 Printer.

APPLICATION PROGRAMS: IBM currently offers six cross-industry accounting application packages for the 5120, as described below. In addition, a number of Field-Developed Programs (FDPs) and Installed User Programs (IUPs) have been developed for the 5110 and presumably can be used on the 5120 as well; these are listed under SOFTWARE PRICES at the end of this report.

The six accounting application packages—Billing, Payroll, Accounts Payable, Accounts Receivable, Inventory Reporting, and General Ledger—were announced along with the 5120, and represent enhanced versions of field-developed accounting programs for the 5110. The six packages have a number of common features:

- The applications are interrelated through generation of transaction data files on diskettes for direct input to other applications where appropriate.
- Ease of use is enhanced by means of menu-driven selection of procedures and/or screen prompting.
- Installation-time tailoring allows the user to select key options and specific control and report data.

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- Auditability and control are provided through techniques such as zero balancing and control totals.

- BRADS II file definitions are provided, facilitating the use of the BRADS II data management program to create and maintain files, handle file inquiries, and generate reports from the file data.

- The program documentation is oriented toward customer self-sufficiency during installation and operation.

- IBM's Atlanta-based Installation Support Center provides a customer "hot line" to answer questions about the installation and operation of these programs.

- The minimum equipment requirement is a 5120 Computing System with a 5110 Model B32 Computer (32K-byte Basic), the Diskette Sort feature (not required for the Payroll package), and a 5103 Model 11 Printer.

IBM 5120 Billing is a cross-industry post-billing application that creates invoices for customer orders which have already been packed and shipped. If the IBM 5120 Accounts Receivale (A/R) and Inventory Reporting programs are also installed, the customer name and address, item descriptions, and prices are automatically obtained from diskette customer and item files. If not, the data can be keyed in for each invoice. Transaction records are created for direct input to the A/R and Inventory Reporting programs. Features of the Billing application include the following: interactive entry and editing of customer orders; the ability to override fixed data during data entry; invoicing by single order, specified orders, or batch orders; automatic price extensions; optional application of discounts based on invoice totals; broken-case pricing; up to two sales taxes plus federal excise tax; up to three classes of special charges (packing, freight, etc.); and creation of credit memos for returns and adjustments.

IBM 5120 Payroll performs basic payroll computations and produces payroll checks with earnings statements, a deduction report, a distribution journal, W-2 forms with subtotals, and 941A forms. Features of the system include the following: both hourly and salaried payrolls; weekly, biweekly, semi-monthly, or monthly pay periods; processing of vacation, holiday, and sick time; provision for piecework wages, two overtime rates, a shift differential premium, pay rates based on "skill" codes, commissions, awards, bonuses, etc.; provision for user-specified tax tables for federal and state/local tax computation; provision for various non-statutory deductions; interactive data entry for file creation, maintenance, and transactions; inquiry to any employee record; generation of summary job/department cost distribution data for input to the General Ledger program; and security provisions based on user-selected passwords.

IBM 5120 Accounts Payable is designed to aid the user in controlling cash outflow while maintaining detailed records of vendor invoices and credits. Features of this application include the following: multi-company support; interactive data entry and correction capability; payment by "due date," "on demand," or "within date;" allowance for expedited payments when necessary; provision of information to help management take advantage of vendor discounts; ability to handle partially prepaid invoices, adjustments, transfers, reversals, and debit and credit memos on an accrual basis; credit memo tracking through key reports; cash disbursements from up to nine specified bank accounts; accounting for and deduction of cash discounts; provision for inquiries to the vendor master file; use of specified general ledger accounts; and optional provision of journal entry data on diskette for input to the General Ledger program.

IBM 5120 Accounts Receivable is designed to provide timely information to help improve cash flow and reduce bad debt losses through control of the user's receivables. The accounts receivable transactions are summarized into debits and credits to the general ledger accounts. The system produces a summarized journal report and an optional diskette general ledger transaction file, summarized by account, for input to the General Ledger program. Features of the Accounts Receivable system include the following: interactive entry and correction of invoice, debit memo, credit memo, payment, adjustment, and late charge data; choice of open-item or balance-forward accounting; accounts receivable aging, including three aged, one current, and one future period, with aged trial balance on demand; automatic creation of late charge transactions; deferred statement printing; ability to suppress statements and/or late charges on an individual customer basis; credit limit and past due reporting; and interfaces to the Billing and General Ledger programs.

IBM 5120 Inventory Reporting aids the user in making purchasing decisions by producing management reports that reflect stock movement, on-hand and on-order quantities, as well as sales and cost data. Features of the system include the following: perpetual inventory maintenance; on-demand stock status reporting, with flagging of exception items (out of stock, below reorder level, etc.); provision for inquiries to the inventory master file; comprehensive inventory analysis reports; maintenance of month-to-date and year-to-date sales and cost data for all items; item costing by both average cost and last cost; a physical inventory list, in sequence by warehouse and location; maintenance of separate quantity on-hand and warehouse location data for up to three warehouses; and the ability to handle broken-case quantities.

IBM 5120 General Ledger handles the basic bookkeeping functions of posting journal entries to the general ledger and producing financial statements. Features of the system include the use of standared dobule-entry bookkeeping principles; production of a general ledger, general ledger trial balance, chart of accounts, and transaction listings; production of a balance sheet and income statement in concise 8½-by-11-inch format; use of a master menu screen, with optional return after each procedure; the abilty to accommodate up to 11 major divisions of accounts; user tailoring of the account structure within each division; and the ability to accept diskette transaction files generated by the IBM 5120 Payroll, Accounts Payable, and Accounts Receivable programs.

PRICING

POLICY: The 5120 Computing System is available for purchase or through a Purchase Pilot Test Plan. A separate maintenance contract is available. No on-site installation assistance is provided with this product; the customer sets up the system from step-by-step instructions packaged with the unit. The warranty period is three months, and begins on the first weekday following confirmed receipt of the machine at the customer's premises. All units are shipped FOB Plant of Manufacture, which means that the customer pays the transportation charges.

The Purchase Pilot Test Plan enables prospective purchasers to try out the 5120 without committing the full purchase price. The plan provides for a contract period that allows three months' use of the system at a price ranging from approximately 20 to 26 percent of the purchase price, depending upon the model, options, and peripherals selected. This price includes maintenance, and is payable in three equal monthly installments. One additional test period of three months can be contracted. Conversion to purchase can be made at any time, with credit toward the purchase price of up to 70 percent of the Test Plan payments.

IBM 5120 Computing System

IBM's standard 10 percent educational discount applies to the 5120 Computing System.

The 5120 is in IBM maintenance group D. Prime-shift maintenance is provided for any consecutive nine-hour period between 7 a.m. and 6 p.m., Monday through Friday. The premium for extended maintenance coverage is expressed in the table below as a percentage of the prime-shift maintenance charges, which are shown in the accompanying price list.

	Consecutive Hours				
	9*	12	16	20	24
Monday-Friday (until 8 a.m., Saturday)	10%	12%	14%	16%	18%
Saturday (until 8 a.m., Sunday)	4%	5%	7%	8%	9%
Sunday (until 8 a.m., Monday)	5%	7%	9%	11%	12%

*For periods outside the basic 7 a.m. to 6 p.m. prime shift.

For users without a maintenance contract, the 5120 is maintained under per-call class 2. The per-call charge for service during regular hours is $105 per hour, and during off hours the charge is $123 per hour.

IBM's Atlanta-based Installation Support Center is staffed by systems and application specialists who will answer customer questions about all aspects of the 5120 Computing System and the 5120 Accounting Applications by means of a toll-free "hot line." The hot line hours are 8:30 a.m. to 5:00 p.m., Eastern Time, on Monday through Friday. After hours, customers may leave recorded messages which will be answered the next business day.

The hourly rate for IBM systems engineering services is $57. SE services are offered on an "as available" basis.

IBM software for the 5120 is separately licensed and available for the monthly license fees or one-time charges listed in the SOFTWARE PRICES section that follows.

EQUIPMENT: The prices shown for the following representative systems include all of the indicated hardware but do not include software license charges.

MINIMUM BASIC SYSTEM: Consists of the 5110 Model B31 Computer, which includes CRT display, keyboard, dual diskette drives, Basic interpreter, and 16,384 bytes of main memory, plus the Channel Terminator feature. Purchase price is $5,860, and monthly maintenance charge is $100.50.

TYPICAL BUSINESS SYSTEM: Consists of the 5110 Model B32 Computer, which includes CRT display, keyboard, dual diskette drives, Basic interpreter, and 32,768 bytes of main memory; the Diskette Sort feature; and a 120-cps 5103 Model 12 Printer. Purchase price is $8,695, and monthly maintenance charge is $161.

LARGE SCIENTIFIC SYSTEM: Consists of the 5110 Model A34 Computer, which includes CRT display, keyboard, dual diskette drives, APL interpreter, and 65,536 bytes of main memory; and an 80-cps 5103 Model 11 Printer. Purchase prie is $10,155, and monthly maintenance charge is $159.50.

EQUIPMENT PRICES

		Purchase Price	Monthly Maint.
PROCESSORS AND MAIN MEMORY			
5110 Model 3	System includes 1024-character display, a keyboard, two diskette drives, read-only storage for the language interpreter(s), and main memory as detailed below:		
	APL Language Interpreter—		
A31	With 16,384 bytes of main memory	$6,220	$ 98.50
A32	With 32,768 bytes of main memory	7,005	104.00
A33	With 49,152 bytes of main memory	7,790	110.00
A34	With 65,536 bytes of main memory	8,575	115.00
	Basic Language Interpreter—		
B31	With 16,384 bytes of main memory	5,680	98.50
B32	With 32,768 bytes of main memory	6,465	104.00
B33	With 49,152 bytes of main memory	7,250	110.00
B34	With 65,536 bytes of main memory	8,035	115.00
	APL and Basic Language Interpreters—		
C31	With 16,384 bytes of main memory	6,760	104.00
C32	With 32,768 bytes of main memory	7,545	110.00
C33	With 49,152 bytes of main memory	8,330	115.00
C34	With 65,536 bytes of main memory	9,115	121.00
PROCESSOR OPTIONS			
1250	Audible Alarm	50	—
1524	Expansion Feature (required for attachment of the Asynchronous Communications Adapter or the Serial I/O Adapter)	270	8.00
1525	Asynchronous Communications Adapter	540	12.50
1600	Channel Terminator (required when a 5103 Printer is not attached)	180	2.00
2074	Binary Synchronous Communications Adapter (BSCA)	1,800	14.00
3200	Diskette Sort Feature	235	3.00
3701	EIA/CCITT Interface (required with BSCA)	430	5.50
5500	1200-bps Integrated Modem (non-switched)	660	6.00
5501	1200-bps Integrated Modem (switched)	880	8.50
5508	1200-bps Integrated Modem (switched with auto-answer)	1,015	12.00
5650	Dataphone* Digital Service Adapter (point-to-point)	840	6.00

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EQUIPMENT PRICES

		Purchase Price	Monthly Maint.
PROCESSOR OPTIONS (Continued)			
5651	Dataphone* Digital Service Adapter (multipoint)	$ 840	$ 6.00
5825	Parallel I/O Adapter	630	21.00
6301	Serial I/O Adapter	630	19.00

*A trademark of AT&T.

PROCESSOR UPGADES

—	5110 Model 3 computers can be field-upgraded to models with additional memory and/or to models with both Basic and APL interpreters. Purchase prices for field upgrades are in all cases equal to the difference between the purchase prices of the two models.	—	—

MASS STORAGE

5114	Diskette Unit (with one 1.2-megabyte drive)	2,240	35.00
3240	Second Diskette Drive for the 5114	1,550	21.50

PRINTERS

5103 Model 11	Printer; 80 cps, bidirectional	1,580	44.50
5103 Model 12	Printer; 120 cps, bidirectional	1,995	54.00
—	Upgrade from Model 11 to Model 12	415	—
4450	Forms Stand	56	—

SOFTWARE PRICES

		Monthly Charge	One-Time Charge
UTILITY PROGRAMS			
5721-DC3	Print Plot/Basic Problem Solver Library	—	$ 575
5721-DC4	Print Plot/APL Problem Solver Library	—	575
5721-DC5	Business Analysis/Basic Problem Solver Library	—	603
5721-DC6	MATH/Basic Problem Solver Library	—	603
5721-DC7	STAT/Basic Problem Solver Library	—	603
5721-XB7	BRADS II/Spread Sheet Generator (SPREAD) (FDP)	$ 58*	—
5798-NPL	Business Report/Application	58*	—
5798-NPT	Basic Text Editor (FDP)	58*	—
5798-NRC	Optical Mark Readers (FDP)	—	575
5798-NRH	Screen Design Aid (FDP)	—	258
APPLICATION PROGRAMS			
5721-XB1	IBM 5120 Billing	76**	—
5721-XB2	IBM 5120 Payroll	76**	—
5721-XB3	IBM 5120 Accounts Payable	76**	—
5721-XB4	IBM 5120 Accounts Receivable	76**	—
5721-XB5	IBM 5120 Inventory Reporting	76**	—
5721-XB6	IBM 5120 General Ledger	76**	—
5796-NQA	Payroll/Labor Costing (IUP)	155*	—
5796-NQB	Comprehensive Construction Payroll/Job Costing (IUP)	184*	—
	Job Cost Control System—		
5796-RCB	Job Costing	126*	—
5796-RCC	Accounts Payable	126*	—
5796-RCD	Payroll	126*	—
5796-RCE	Accounts Receivable	132*	—
5796-RCF	General Ledger	132*	—
5796-ZAB	Home Builders Management System	—	6,900
5796-ZAG	Attorney Information System	—	8,280
5798-NKK	Project Control System (FDP)	345*	—
5798-NPG	Business Planning (FDP)	230*	—
5798-NPH	General Ledger (FDP)	86*	—
5798-NPJ	Payroll (FDP)	92*	—
5798-NPK	Accounts Payable (FDP)	86*	—
5798-NPN	Accounts Receivable (FDP)	86*	—
5798-NQQ	Meat Blending (FDP)	172*	—
5798-NRE	Computing for an Accounting Practice (FDP)	166*	—
5798-NWA	Fixed Asset Accounting and Control System (FDP)	161*	—

*Paid up in 12 months.
**Paid up in 24 months.