

IBM 5100 Portable Computer

▷ round-off and truncation. In purchased algorithms, such as those in the IBM program libraries, normal practice includes identifying the applicable range of each procedure in the supporting documentation accompanying it. This can sometimes be overlooked. But the real problem is with user-generated procedures. Calculation of the applicable range for a given error level is a taxing mathematical procedure that is often ignored because of the time it adds to the programming task. Widespread use of desk-top computers such as the IBM 5100 may well lead to increased interest in providing the user with improved methods of estimating error ranges for his programmed procedures. In any case, prospective users should be made aware of the old precision/accuracy problem, which has been faced by data processing personnel since the early days of computers, but which may be entirely new to people just acquiring a desk-top computer.

The concept of a desk-top calculator/computer that can be programmed in a higher-level language is not new. Both Hewlett-Packard and Wang Laboratories have marketed such units for several years, and in the same price range as the IBM 5100 for equivalent configurations. However, the 5100 is distinguished by the capacity of its main memory and in the provision of two programming languages.

Memory sizes range from 16K bytes to 65K bytes in 16K increments. For each memory size, there is a corresponding 5100 model for the BASIC language, for the APL language, and for a combination of BASIC and APL. Switching between the languages in the combined models is accomplished through a front panel switch.

The BASIC language is widely known and used. Its English-like statement keyword structure makes it an easy language to learn and a logical choice for first-time users. BASIC also provides convenient facilities to handle alphanumeric strings for annotating tables. The APL language is more suited to expressing complex mathematical relationships.

The 5100 is also novel in the way IBM is supporting it. The support is similar to that provided for the company's typewriters. No customer engineer shows up when you install the 5100. You read the instruction book that comes with it and set it up yourself.

When initially released, the IBM 5100 was a purchase-only item. In December 1975, three months after its introduction, a Purchase Pilot Test Plan was announced to make the 5100 available to more users. (For details on this rental plan, see the next leaf, M11-491-207). Maintenance agreements are available, naturally, just as with typewriters. IBM has set up a separate staff to handle the 5100 within the General Services Division.

IBM's entry into the field of personal or desk-top computers, timed as it is at the beginning of the wide availability of microprocessors, may herald the start of a highly competitive market segment. If that is the case,

you can expect to see many specialized models announced by many vendors, each tailored to a specific type of computational problem. Software houses will no doubt get into the act as well, with specialized program offerings for the IBM 5100 and similar computers. The prospect of this may make one want to learn what all of these exotic-sounding functions—such as Bessel functions of the first kind and fractional order, multivariate analysis, and discounted cash flow—are all about. □

▶ tion 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. The complete MATH library can be run on a 5100 A2 (APL), B2 (BASIC), or C2 configuration. A majority of the routines in the BASIC library can be run on a 5100 B1.

The *STAT/Problem Solver Library* includes 40 (APL) or 41 (BASIC) 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; nonparametric 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 BASIC library can be run on a 5100 B1 or C1; the APL library requires a 5100 A2 or C2.

PRICING

POLICY: The 5100 Portable Computer was initially available only on a purchase basis (although an installment purchase arrangement could be made). However, three months after the 5100's introduction, a Purchase Pilot Test Plan was announced. This is a short-term rental arrangement for customer evaluation of the 5100 and is detailed on the following leaf. A separate maintenance contract is available. No 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 extends from the date of shipment from the plant for a total of 10 days plus 3 months.

A separately priced set of magnetic tape cartridges furnishes instructions in the BASIC (\$225) or APL (\$295) programming language. Two source-code data cartridges and a user's guide accompany each program library and include instructional material. The program libraries are furnished for a one-time license fee. The user is expected to maintain duplicate, back-up copies of the data cartridges.

The standard 10 percent educational discount applies to the basic computer and peripherals.

EQUIPMENT: The following prices include all attachment features required, but do not include any program libraries.

MINIMUM BASIC SYSTEM: Consists of BASIC 5100 Model B1, which includes integral CRT display, magnetic tape cartridge, and 16,384 bytes of main storage. About 12,000 bytes of main storage is available to the user. The only programs available that can be run on this configuration are STAT and portions of MATH. The BASIC interpreter is included. The purchase price of this system is \$8,975, and the monthly maintenance cost is \$55.

MINIMUM BUSINESS-ORIENTED SYSTEM: Consists of BASIC 5100 Model B2, which includes integral CRT display, magnetic tape cartridge, and 32,768 bytes of main memory, plus the optional 5103 printer. About 28,400 bytes of main memory is available to the user. The Business program library, the MATH library, and the STAT library ▶

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▶ can be run on this configuration. The BASIC interpreter is included. The purchase price is \$15,650, and the monthly maintenance cost is \$95.

LARGE SCIENTIFIC SYSTEM: Consists of APL 5100 Model A4, which includes integral CRT display, magnetic

tape cartridge, and 65,536 bytes of main memory, plus the 5103 printer and 5106 Auxiliary Tape Unit. About 58,800 bytes of main memory is available to the user. The MATH and STAT program libraries can be run. The APL interpreter is included. The purchase price is \$24,350, and the monthly maintenance cost is \$125. ■

EQUIPMENT PRICES

PROCESSORS AND MAIN MEMORY		<u>Purchase</u>	<u>Monthly Maint.</u>
5100	Portable Computer; includes 1024-character display, magnetic tape cartridge drive, ROS for language processor, and main memory as detailed below:		
	APL Language Interpreter—		
A1	With 16,384 bytes of main memory	\$ 9,975	\$65
A2	With 32,768 bytes of main memory	12,675	70
A3	With 49,152 bytes of main memory	15,375	75
A4	With 65,536 bytes of main memory	18,075	80
	BASIC Language Interpreter—		
B1	With 16,384 bytes of main memory	8,975	55
B2	With 32,768 bytes of main memory	11,675	60
B3	With 49,152 bytes of main memory	14,375	65
B4	With 65,536 bytes of main memory	17,075	70
	APL and BASIC Language Interpreters—		
C1	With 16,384 bytes of main memory	10,975	70
C2	With 32,768 bytes of main memory	13,675	75
C3	With 49,152 bytes of main memory	16,375	80
C4	With 65,536 bytes of main memory	19,075	85
OPTIONS			
1524	Expansion Feature; required for Communications Adapter	300	6
1525	Communications Adapter	600	10
3601	External I/O Adapter; required for 5103 Printer or 5106 Auxiliary Tape Unit	300	6
1501	Carrying Case, soft	125	—
MAGNETIC TAPE DRIVES			
5106	Auxiliary Tape Unit	2,300	10
	Tape Cartridges, per package of five	100	—
PRINTERS			
5103	Printer, 80 cps	3,675	29

SOFTWARE PRICES

		<u>License Fee</u>
5721	Problem Solver Libraries—	
-XM3	Business Analysis, BASIC User's Guide	\$500.00 19.00
-XM1	MATH, BASIC User's Guide	500.00 23.00
-XM2	MATH, APL User's Guide	500.00 17.50
-XA1	STAT, BASIC User's Guide	500.00 22.50
-XA2	STAT, APL User's Guide	500.00 22.50