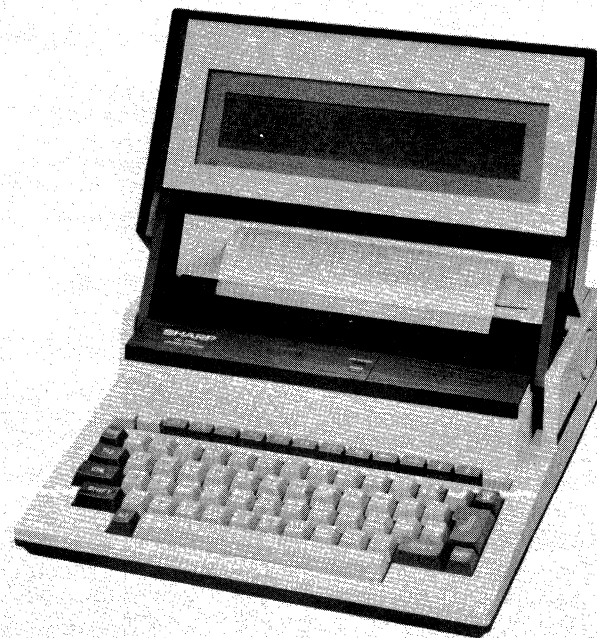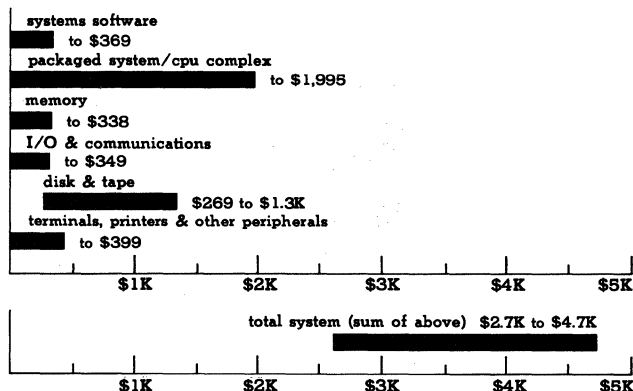# Sharp PC-5000
Portable Microcomputer

■ PROFILE

Operating System ● MS-DOS 2.0 from Microsoft.

Data Management ● none available from Sharp.

Communications/Networks ● SuperCom asynchronous communications package.

Languages ● GW BASIC from Microsoft.

Models ● PC-5000.

CPU ● 16-bit Intel 8088 microprocessor.

Memory ● 128K bytes of RAM expandable to 256K bytes; 192K bytes of ROM.

Chassis Slots ● 2 memory expansion slots.

Ports ● RS-232C interface, serial I/O interface, expansion bus interface.

Mass Storage ● dual 360K-byte diskette drives; 128K-byte bubble memory cartridge available.

Terminals/Workstations ● single-user system.

Printers ● integral thermal printer available.

First Delivery ● November 1983.

Systems Delivered ● information not available.

Comparable Systems ● Gavilan, Grid, Teleram, MicrOffice Roadrunner, Radio Shack Model 100, NEC PC8201, Epson HX-20, Xerox 1800.

Vendor ● Sharp Electronics Corporation; 10 Sharp Plaza, Paramus, NJ 07652 ● 201-265-5600.

PURCHASE PRICE RANGE   hardware & software ■■■■■

```
systems software
■■ to $369
packaged system/cpu complex
■■■■■■■■■■■■■ to $1,995
memory
■■ to $338
I/O & communications
■■ to $349
  disk & tape
    ■■■■■■■ $269 to $1.3K
terminals, printers & other peripherals
■■ to $399
      |        |        |        |        |
     $1K      $2K      $3K      $4K      $5K

        total system (sum of above)  $2.7K to $4.7K
                          ■■■■■■■■■■■■
      |        |        |        |        |
     $1K      $2K      $3K      $4K      $5K
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SHARP PC-5000 PURCHASE PRICING bar graphs illustrate price ranges for small to large systems, with solid bars reflecting software/hardware purchase pricing ● **SMALL SYSTEM** is based on PC-5000 packaged system (includes CPU, 128K-byte RAM, 192K-byte ROM, LCD, keyboard, RS-232C port, serial modem port, external bus interface, cassette interface, MS-DOS, GW BASIC, SuperWriter, SuperCom) and the following options: 128K-byte bubble memory cartridge; integral thermal **printer** ● **LARGE SYSTEM** is based on PC-5000 packaged system (includes CPU, 128K-byte RAM, 192K-byte ROM, LCD, keyboard, RS-232C port, serial modem port, external bus interface, MS-DOS, GW BASIC, SuperWriter, SuperCom) and the following options: SuperCalc spreadsheet software; additional 128K-byte RAM memory; modem; 128K-byte bubble memory cartridge; dual 5.25-inch diskette drives; integral thermal printer.

Canada ● Sharp Electronics of Canada, Ltd; 116 Galaxy Boulevard, Rexdale, ON M9W 4Y6 ● 416-675-7244.

Distribution ● through approximately 350 independent retailers in the U.S.; also distributed worldwide.

■ ANALYSIS

Sharp Electronics Corporation is a $700 million U.S. subsidiary of Sharp Corporation of Japan. In addition to computers, the company offers a full line of calculators, copiers, electronic cash registers, banking equipment, electronic typewriters, televisions/VCRs and audio equipment. The PC-5000 is Sharp's major entry into the portable/briefcase computer marketplace.

The briefcase computer market is just starting to evolve, so it's a little too early to tell how applicable systems will fare. Right now there isn't too much competition for Sharp. Its major competitor, the Gavilan, is supposed to be available in retail stores in March 1984.

A quick comparison of the 2 units shows the Gavilan with a higher price tag for comparable system features. The major difference between the 2 systems is in the type of mass storage—the Gavilan uses 3-inch diskette drives, the PC-5000, bubble memory with external 5.25-inch drives optional. The Gavilan also offers a touchpad for pointing to some on-screen functions and a video monitor interface. A user would have to decide whether it was worth the extra

Sharp PC-5000
Portable Microcomputer

money to pay for these conveniences. The CPU and types of applications are similar on both units.

Other somewhat similar types of systems are the Radio Shack Model 100, the Epson HX-20, the NEC PC-8201, and the Xerox 1800. These systems are priced lower than the PC-5000 but also offer limited capabilities. For example, the Model 100 provides from 8K to 32K bytes of RAM as opposed to a minimum of 128K bytes for the PC-5000. At the high end of the market sits the Grid system with a price tag at least triple that of the Sharp machine.

Sharp is targeting the PC-5000 at the Fortune 1000s, mid-sized and small companies, and professionals. They estimate that the systems would be used 50 percent of the time on the road, and the rest of the time split between home and the office. The product is marketed worldwide by the various Sharp organizations.

Starting in April Sharp's Canadian subsidiary will offer the EasyWriter II, EasyPlanner, and EasyCom software packages in a 640K-byte ROM cartridge. They will also offer a French language file which will talk to the ROM but reside in bubble memory. Other language files in German, Italian, Spanish, etc will be offered in applicable countries. These products are not yet available in the U.S.

☐ Strengths

The size, weight, and capabilities of the PC-5000 are all to be applauded. It's small enough to fit into a briefcase, weighs only 13 pounds with an integral printer, isn't excessively expensive, and provides sufficient computing power and major types of applications for professionals who are always on the go. It's an attractive-looking unit that didn't have to make too many tradeoffs to provide true portability.

☐ Limitations

The major tradeoff Sharp made to provide such a compact portable was in the display capabilities. Not only is the 8-line LCD rather limiting, but the screen does not provide sufficient contrast, thereby making the characters hard to view. The lack of an external video interface and the high price of bubble memory as compared to diskette storage are other limiting factors of the system.

■ SOFTWARE

☐ Terms & Support

Terms ● MS-DOS, GW BASIC, SuperWriter, and SuperCom are bundled; other software is available for a one-time license fee.

Support ● toll-free 800 number for software support.

☐ Software Overview

The Sharp PC-5000 utilizes Microsoft's MS-DOS 2.0 operating system and GW BASIC language. The DOS resides in a 64K-byte ROM chip and the GW BASIC in a ROM cartridge which occupies one of the 2 slots under the system unit.

Sorcim's SuperWriter word processor, SuperCom asynchronous communications package, SuperCalc-2 electronic spreadsheet, and SuperPlanner executive scheduling system are also available. Both SuperWriter and SuperCalc reside in 128K-byte bubble memory cartridges while the 2 other programs are available on diskettes.

A Main Menu Controller which eliminates having to use MS-DOS

commands is packaged with the SuperWriter cartridge. The "Super" software products are integrated so the user can switch between various packages via the Main Menu Controller; data can be passed between the programs via a Scratch Pad. All of the Super software products and the Main Menu Controller provide AnswerScreens (Help) with explanations of the various system functions.

Various third-party packages have been converted to run on the PC-5000 and are available immediately. Representative samples include dBase II, BASIC, FORTRAN, COBOL, and C compilers for Digital Research, Microsoft, and Ryan-McFarland, Tax Planner, and Statpak. In the works are products from Micropro, Perfect Software, and Software Publishing, to name a few.

☐ Operating Systems

MS-DOS 2.00 ● single-user, interactive and batch processing operating system with UNIX-like hierarchical directories, piping functions, filters, and hard disk support; equivalent to IBM PC-DOS 2.0 ● supports up to 180K bytes in up to 64 different files in single-sided format and up to 360K bytes in up to 112 files double sided, and 5M or 10M bytes with thousands of file names on hard disk; handles records from 1 to 65,535 bytes long in file transfer, executes external (disk-based commands) giving the user ability to expand the DOS vocabulary to limits of disk space ● batch processing capabilities with automatic execution on power-up, user commands include: DATE, TIME, COPY, ECHO, PATH, MKDIR, RMDIR, CHDIR, TREE, RECOVER, GRAPHICS, BREAK, and CTTY ● additions over DOS 1.25 in performance include hierarchical directories to facilitate hard disk use, numerous performance enhancements, redirection of input/output (I/O), piping of functions (sequentially rather than concurrently as in UNIX), higher sector density per track (9 sectors per track versus 8 in DOS 1.25), and installable device drivers ● MS-DOS is divided into 4 parts: a device-independent I/O handler, an I/O processor, reference and jump vectors in low memory, and a command processor; the device-independent I/O handler on hidden file MSDOS.SYS is the core of MS-DOS through which I/O must be directed; the I/O processor physically moves data and instructions by means of hidden file IO.SYS as commanded by MSDOS.SYS; the command processor, using the COMMAND.COM program, is responsible for interface between user and MS-DOS, error trapping, batch file processing, interpreting user commands, and executing file names ● MS-DOS 2.00 will read earlier MS-DOS diskettes; there are several unique system-interrupt calls and file descriptors that make programs utilizing these features nontransportable between MS-DOS 2.00 and earlier versions ● an editor, debugger, and other utilities are provided ● bundled with the system.

SuperTools (Main Menu Controller) ● eliminates the need to use MS-DOS commands and performs various MS-DOS functions; used to invoke any member of the "Super" software products ● features the ability to maintain a disk/bubble cartridge directory; copy files; print directories; delete and rename files; treat the Scratch Pad as a file for printing functions; enter date and time; give status line reports indicating capacity, number of files, and free space on disk/bubble cartridge; assign function key usage; maintain a record of date and time of file creation/revision and number of bytes used; and transfer files to a mass storage device ● resides on SuperWriter bubble cartridge; included with the system.

Scratch Pad ● for transferring and/or exchanging data between software programs ● provides a main memory 8K-byte buffer; stores ASCII text only ● included with the system.

☐ Utilities

Standard MS-DOS utilities are inherent in the operating system; additional MS-DOS utilities are optional; the Super Data Interchange program, which comes unbundled with SuperCalc-2, converts SuperCalc-2 files into different formats.

☐ Data Management

None available from Sharp.

☐ Communications/Networks

SuperCom ● provides asynchronous TTY emulation; also

Sharp PC-5000
Portable Microcomputer

provides a 27K-byte buffer for saving and storing transmitted data for review at a later time ● supports all capabilities of the Sharp modem ● bundled with the system.

☐ Program Development/Languages

GW BASIC Interpreter ● implementation of Microsoft BASIC-86 ● provides dual-mode graphics capabilities in medium and high resolution, and drawing statements for creating lines and circles or painting the screen ● screen editor implements special function keys and multistatement lines ● allows calling of machine language subroutines, merging of multiple programs, and transferring control to specific program lines during certain events ● IF THEN/ELSE constructs are supported as well as trace/notrace ● bundled with the system.

☐ Applications Packages

SuperWriter (Executive Version) ● full-function word processor with built-in form letter generator ● utilizing function keys, users can edit/create a document; set print parameters; print a document; access file utilities such as directory, type, copy, erase, and rename; and enter data into and/or retrieve data from the Scratch Pad ● provides proportional spacing, boldfacing, underlining, superscript, pagination, headers and footers ● the first 7 lines of the display are for text; the 8th line is used for defining the function keys ● comes in a bubble memory cartridge; occupies 100K bytes; bundled with the system.

SuperWriter (Deluxe Version) ● includes the same features and capabilities as the Executive Version plus added features and functions such as additional print commands and a spelling dictionary ● comes on a floppy disk:

$129 lcns

SuperCalc-2 ● electronic spreadsheet; 63 columns x 254 rows ● provides for consolidation, sorting, variable column widths, various formatting options ● displays 2 windows, one for results, the other for formulas; both can be scrolled simultaneously ● available on 128K-byte bubble memory cartridge; occupies 70K bytes:

369

SuperPlanner ● executive notebook providing facilities for maintaining a daily calendar, appointment book, address book, and activity log; also edits notes and memos ● comes on a diskette:

129

■ HARDWARE

☐ Terms, Support & Documentation

Terms ● available for purchase only ● 90-day warranty.

Support ● EXTRA (EXtended Time Replacement Agreement) available directly from Sharp; includes 3 types of plans—overnight exchange, over-the-counter exchange, and mail-in repair.

Documentation ● 2 books—User's Guide and Software Guide plus abbreviated, get started 10-minute guides included with the system ● User's Guide covers the PC-5000 components, how to use the system, installing and operating the printer, how to use MS-DOS, and BASIC reference manual ● Software Guide gives an overview of the applications products, how to use the master menu, and the SuperWriter reference guide.

☐ Physical Specifications (H x W x D; Weight)

System Unit ● 3.44 x 12.84 x 12 inches; 9.74 pounds.

Display ● information not available.

Keyboard ● integrated with CPU in system unit.

☐ Systems Overview & Configurability

The PC-5000 is an integrated portable unit consisting of a CPU, display, keyboard, and mass storage packaged in a less than 10-pound unit. It utilizes a 16-bit Intel 8088 microprocessor and provides 128K bytes of RAM expandable to 256K and 192K bytes of ROM. System interfaces include a serial I/O port for modem connection, an RS-232C port, an audio cassette port, and an external bus driver for connecting disk drives. It also provides 2 open slots underneath the unit for memory expansion.

The system's liquid crystal display presents 8 lines of 80-column text and folds over the face of the keyboard when being transported. Storage is in the form of a 128K-byte bubble memory cartridge which is plugged into a compartment behind the keyboard. The PC-5000 runs for 6 hours on a rechargeable lead battery, or it can be plugged into an AC outlet.

To round out the system's capabilities, Sharp offers an integral thermal printer and a 300-bps modem. An external 5.25-inch dual drive diskette is also available. The printer, which weighs only 3 pounds, fits neatly into an opening behind the bubble memory cartridge slot. The modem, in addition to providing access to public databases and other computers, also acts as a separate numeric keypad for the PC-5000. It is stored in a compartment behind the LCD when not in use.

Maximum configurability is stated below; minimum configurations are discussed under Packaged Systems.

PC-5000 System Maximums ● CPU with either 256K-byte RAM and 128K-byte ROM including MS-DOS, or 192K-byte RAM and 192K-byte ROM including MS-DOS and GW BASIC; LCD (liquid crystal display), keyboard, integral printer, modem, dual diskette drive, RS-232C port, cassette interface, SuperWriter in bubble memory cartridge, empty 128K-byte bubble memory cartridge.

☐ Packaged Systems

PC-5000 ● includes CPU, 128K-byte RAM, 192K-byte ROM with MS-DOS and GW BASIC, LCD, keyboard, RS-232C port, serial modem port, external bus interface, cassette interface, SuperWriter word processor in 128K-byte bubble memory cartridge, SuperCom on diskette:

$1,995 prch

☐ CPU

Intel 8088 Processor ● 8-bit data bus interface, 16-bit internal architecture, direct addressing to 1M bytes of memory, 16-bit register set with symmetrical operations, approximately 70 basic instructions with up to 30 addressing modes, 8-bit and 16-bit signed and unsigned arithmetic with binary and decimal operands, extensive string and block move facilities ● powerful segmentation facilities allow memory partitioning for multitasking, concurrent, or multiuser capabilities ● a pseudo-superset of the Intel 8080 instruction set where translation to 8088 is straightforward ● instruction set compatible with 8086.

☐ Memory

The PC-5000 comes standard with 128K bytes of RAM and 192K bytes of ROM. The ROM is divided into 2 64K-byte ROM chips and a 64K-byte ROM cartridge. One of the 64K-byte chips provides for system functions such as I/O routines while the other 64K-byte chip contains MS-DOS 2.0. The ROM cartridge which resides in one of the 2 expansion slots beneath the unit contains GW BASIC. The RAM is expandable up to 256K bytes by inserting 64K-byte RAM cartridges in the 2 expansion slots. However, to achieve this RAM maximum, the ROM cartridge will have to be removed.

CE-100M 64K RAM Module ● for expanding memory beyond 128K bytes ● maximum of 2 cartridges; plugs into 1 of the 2 expansion slots located on the bottom side of the computer:

$169 prch

☐ I/O & Communications

The PC-5000 provides a full-duplex RS-232C port operating at up to 19.2K bps, a serial I/O port for modem connection, an audio cassette controller, and an external bus driver for attaching a

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LCNS: one-time license fee. Prices effective as of December 1983.

PRCH: purchase price. Prices effective as of December 1983.

Sharp PC-5000
Portable Microcomputer

floppy disk drive. An auto-dialer direct-connect modem is optional.

CE-510T Modem/Dialer ● direct connect, 300-bps modem; AT&T 103 compatible ● stores 10 phone numbers up to 16 digits long for auto-dialing on touch-tone or telepulse lines; speaker and microphone are built-in for conference calling ● also serves as a separate 10-key numeric pad for the PC ● connects to the serial I/O port via a standard bell jack:

$349 prch

☐ Mass Storage

Storage on the PC-5000 can be in the form of diskette drives and/or bubble memory.

CE-510F Dual Drive ● 5.25-inch double-sided, double-density 360K-byte diskettes; 512 bytes per sector, 8 sectors per track, 40 tracks per side ● plugs into external bus driver:

$999 prch

CE-100B 128K Bubble Cartridge ● stores 512 bytes per sector, 8 sectors per track ● plugs into bubble memory storage area:

269

☐ Terminals/Workstations

Display ● liquid crystal display (LCD) folds over top of keyboard for portability ● displays 80 characters x 8 lines of ASCII text; 62 characters plus 33 special symbols ● bit-mapped graphics; resolution of 640x80 pixels.

Keyboard ● integral typewriter-style keyboard ● 8 user-definable function keys programmable for 23 functions and 4 cursor control keys located across the top of the keyboard.

☐ Printers

Sharp offers an integral thermal printer which can be inserted into the back of the PC-5000.

CE-510P Thermal Printer ● prints 80 characters per line at 37 cps in 12 cpi format or 66 characters per line at 30 cps in 10 cpi format ● uses either thermal paper or, with a carbon ribbon inserted, plain bond paper:

$399 prch

● END

Sperry Personal Computer
Models 10, 20, 25, 30, 40, 45 & 50

■ PROFILE

Operating Systems ● MS-DOS Version 1.25 is included with diskette-based models (10, 20, 25, 30), and MS-DOS Version 2.0 is included with the fixed-disk-based models (40, 45, 50) ● Concurrent CP/M-86 optionally available.

Data Management ● dBase II relational database management system.

Communications/Networks ● Crosstalk asynchronous communications package; IBM 3270 emulation; IBM 3270 SNA communications; UNISCOPE synchronous communications with Sperry Series 1100 or Series 80 or 90 computers ● all packages supported on all models.

Languages ● Microsoft's GWBASIC bundled on all models ● Microsoft's COBOL and FORTRAN optionally available.

Models ● diskette-based Models 10, 20, 25, and 30; hard disk Models 40, 45, and 50.

CPU ● Intel 8088-based on all models with switch-selectable operation of 4.77M cycles per second or 7.16 cycles per second.

Memory ● all models support up to 640K bytes of memory with cycle time of 270 nanoseconds and access time of 150 nanoseconds.

Chassis Slots ● all models include 7 expansion slots with the Models 10, 20, and 25 having 5 available, the Models 30, 40, and 45 having 4 available, and the Model 50 having 3 available.

PURCHASE PRICE RANGE   hardware & software ▮▮▮▮▮▮

```
systems software
▮▮▮▮ to $2,710
     packaged system/cpu complex
     ▮▮▮▮▮▮ $2,643 to $5,753
memory
▮ to $2,161
I/O & communications
▮ to $276
disk & tape
included in packaged system
terminals, printers & other peripherals
▮ to $680

     |      |      |      |      |
    $4K    $8K   $12K   $16K   $20K

     total system (sum of above)
     ▮▮▮▮▮▮▮▮▮ $2,643 to $11,580

     |      |      |      |      |
    $4K    $8K   $12K   $16K   $20K
```
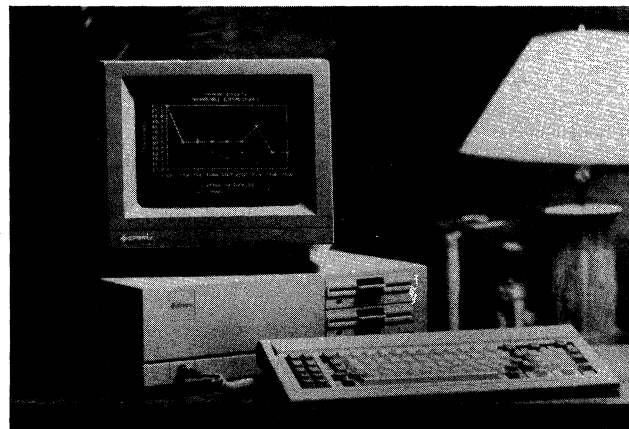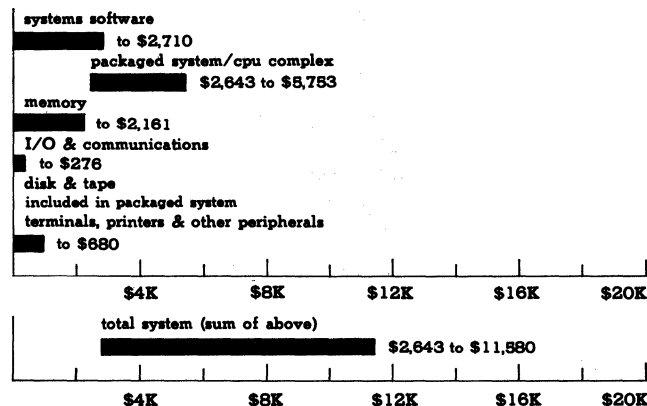
SPERRY PERSONAL COMPUTER PURCHASE PRICING bar graphs illustrate price ranges for small to large systems, with solid bars reflecting software/hardware purchase pricing ● **SMALL SYSTEM** is based on Model 10 **packaged system** (includes Intel 8088-2 microprocessor, 128K-byte memory, 320K-byte floppy disk, 12-inch monochrome display, 84-key keyboard, an RS-232C asynchronous communications port, time-of-day clock, 5 available expansion slots, MS-DOS, GW BASIC, and diagnostic software) ● **LARGE SYSTEM** is based on Model 50 **packaged system** (includes Intel 8088-2 microprocessor, 128K-byte memory, 360K-byte floppy disk, 10M-byte hard disk, 12-inch diagonal high-resolution color display, 84-key keyboard, an RS-232C asynchronous communications port, time-of-day clock, 3 available expansion slots, MS-DOS GW BASIC, and diagnostic software) and the following options: Microsoft's COBOL compiler, dBase II **DBMS**, Crosstalk asynchronous communications, and IBM 3270 emulation; 512K bytes of memory and expansion board; Bisynchronous communications adapter; Model 5 matrix printer and printer interface.

Ports ● all models include an RS-232C asynchronous communication port located on the motherboard; a Centronics-compatible synchronous interface is optionally available attaching to an expansion slot.

Mass Storage ● single, 10M-byte, 5.25-inch hard disk optionally available to all models ● 1 or 2 320K-byte to 360K-byte diskettes are standard, with number and capacities determined by models.

Terminals/Workstations ● all models are single-user systems.

Printers ● an add-on Sperry Model 5 dot-matrix printer or Sperry Model 31 letter-quality printer are optionally available.

First Delivery ● January 1984 for Models 10, 20, 25, and 30; Models 40, 45, and 50 scheduled for delivery in second quarter of 1984.

Systems Delivered ● new product.

Comparable Systems ● over 30 vendors are selling MS-DOS and IBM-compatible desktop microcomputers, including Columbia, Compaq, Corona, Zenith, and Seequa.

Vendor ● Sperry Corporation; Computer Systems, P.O. Box 500, Blue Bell, PA 19424 ● 215-542-4213.

Canada ● Sperry Inc; 55 City Centre Drive, Mississauga, ON L5B 1M4 ● 416-270-3030.

Distribution ● worldwide distribution through direct company sales/service offices and indirectly through thousands of retail and dealer outlets.

■ ANALYSIS

Sperry Corporation, with the announcement of their new Personal Computer, has entered into what Sperry calls the new Sperry era. Here is a traditional mainframe company known for large-scale computing boxes entering a new market with a small desktop computer that is not compatible with their own Sperry 1100 mainframe, but is compatible with an IBM product. This is quite a difference for a company who in the past introduced products manufactured only by themselves and who distributed their products exclusively through their own direct sales

Sperry Personal Computer
Models 10, 20, 25, 30, 40, 45 & 50

force. The new Personal Computer product's components are manufactured by many subcontractors (Mitsubishi, Keytronic, Mini Scribe, Xebec, Epson) and will be distributed through all channels of distribution on a worldwide basis as well as through Sperry's direct sales force. This is a new concept in strategy, development, manufacturing, and marketing for Sperry, hence the new Sperry era.

The Sperry Personal Computer is bit-level compatible with the IBM PC 1 and PC/XT. It supports the same I/O bus architecture, memory organization, and graphics layout, has a look-alike keyboard, and has the same disk/diskette formats. With this level of compatibility, feature boards developed/being developed for the IBM PCs and software applications should operate on the Sperry Personal Computer without change or modification.

The Personal Computer is currently available in 7 models (Models 10, 20, 25, 30, 40, 45, and 50), each of which includes 128K bytes of memory, 20K bytes of ROM containing power-on test diagnostics, and BIOS (Basic Input/Output System), some type of mass storage, a screen and a keyboard, an asynchronous communications feature, a time-of-day clock, and software including a version of MS-DOS operating system, GWBASIC programming language, and diagnostic software. With this combination of hardware and software, any model ordered is a complete working system.

The variations of the models reflect the amount and type of mass storage and the nature of the display. The lower-end diskette-only-based models (10, 20, 25, and 30) include MS-DOS Revision 1.25 operating system while the upper-end diskette and 10M-byte hard disk systems (40, 45, and 50) include MS-DOS Revision 2.0 operating systems. The diskette drives on the low-end models provide 320K bytes of storage and on the high-end models provide 360K bytes to go with the 10M-byte hard disk. Displays available are a monochrome monitor and two color monitors—one a medium-resolution monitor and the other a high-resolution monitor with extensive graphics capabilities. The high-resolution color graphics monitor provides up to 640x400 pixel resolution while still supporting 16 colors; in 320x200 resolution it can display 256 colors.

Sperry's Personal Computer is built around an Intel 8088-2 microprocessor and has a switch-selectable execution rate of either 4.77 MHz (IBM clock speed) or 7.16 MHz. A time-of-day clock with battery backup is also standard which allows the system to automatically stamp each file with the current date setting, eliminating the need for manual entry. The IBM look-alike keyboard, which is standard on all models, provides some enhancements over its IBM counterpart. Its numeric lock and caps lock keys have indicators showing when they are operating; a larger Enter key is positioned next to the numeric pad for ease of operation; and the Return key is in the standard typewriter position.

To go along with the asynchronous communications capability there is also software/hardware available for communications with both Sperry-based mainframes and IBM mainframes.

All in all, Sperry has come up with an IBM-compatible personal computer with some added features—50 percent more speed, improved color graphics, and IBM and Sperry communications capability—at approximately 10 percent below IBM's price. It appears to be quite a nice little system.

□ **Strengths**

The graphics capabilities of Sperry's Personal Computer are quite extensive with support of 640x400 pixel resolution with up to 16 colors; with 320x200 resolution it is able to display 256 colors. In addition, the extra graphics memory provides capabilities for using 4 different pages, and the user can superimpose and change both graphics and text data at the same time.

Another positive feature on the Sperry Personal Computer is the switch-selectable 4.77-MHz and 7.16-MHz operating speeds. This allows the system to operate faster where the application has many calculations such as spreadsheet programs, yet still be able to operate at IBM-compatible speed for IBM clock-sensitive applications.

Sperry has provided its Personal Computer with various communications capabilities. It can communicate with both its own mainframes and IBM's using 3270 emulation in both bisynchronous as well as SNA/SDLC models. The system also provides standard asynchronous communications using Crosstalk for teletype terminal operation allowing access to centralized data services such as Source and Dow Jones.

Because Sperry has seen fit to build its Personal Computer around the same architecture as that adopted by IBM including the same I/O Bus architecture, memory organization, disk/diskette format, operating system, look-alike keyboard, and graphic organization, its Personal Computer will accommodate software applications and hardware add-ons developed for the IBM PC and its look-alikes. This creates a ready-made supply base for users to obtain feature boards developed for the IBM PCs as well as numerous applications.

Another plus for the Sperry Personal Computer has nothing to do with the system itself, but with the company. Sperry has been around for quite a while and has built company credibility, which automatically adds investment protection. With their large present base of mainframe customers (75,000) worldwide, and their large support staff, prospective buyers need not fear that their system will go unsupported in the future, which might not be the case for other IBM-compatible vendors.

□ **Limitations**

Sperry's Personal Computer will currently support only a single 10M-byte hard disk drive. This is only one-half of what is available on the IBM PC 1 and PC/XT, and quite a lot less than what is available with other IBM-compatible manufacturers such as Eagle 16-bit Systems (32M bytes).

The support of the single 10M-byte hard disk does lead to another problem, though—the one of backup. Since about 28 diskettes would be required to backup a full 10M-byte hard disk, the lack of any kind of magnetic tape support in

Sperry Personal Computer
Models 10, 20, 25, 30, 40, 45 & 50

general, and a streaming tape drive in particular, must be considered a limitation.

Although the Sperry Personal Computer can operate 1.5 times faster than IBM's PC 1 and PC/XT for computation-intensive applications, the IBM PCs will support an Intel 8087 arithmetic coprocessor and the Sperry Personal Computer won't. This inability, at least as an extra-cost option as it is on the IBM PCs, is a shortcoming.

■ SOFTWARE

□ Terms & Support

Terms ● MS-DOS (Revision 1.25 on Models 10, 20, 25, and 30, Revision 2.0 on Models 40, 45, and 50), GWBASIC, and diagnostics are included with all of Sperry Personal Computer models ● other optional software products are available on a one-time license fee basis.

Support ● corrective updates and enhancements from the manufacturer ● support through a Sperry 800 telephone number.

□ Software Overview

All Sperry Personal Computer models are bundled with a version of the MS-DOS operating system, the GWBASIC programming language, and diagnostic software. The Models 10, 20, 25, and 30 include MS-DOS Revision 1.25, while the Models 40, 45, and 50 include MS-DOS Revision 2.0. Concurrent CP/M-86 is optionally available for all models.

Optionally available for system/program development are Microsoft's COBOL and FORTRAN programming languages. Programs/systems can also be developed using Ashton-Tate's dBase II relational database management system which also includes a built-in programming language. A Business Graphics Library providing bar chart, circle graphs, and line graphs creation, and Graphics Display Library providing graphics plotter support are optionally available.

Four communication facilities are available which provide asynchronous communications; Sperry UNISCOPE editing terminal emulation supporting communication with a Sperry 1100 Series or OS/3-based mainframe; and 2 IBM 3270 terminal emulators, one as a binary synchronous 3270-type terminal and the other as an SNA/SDLC 3270 device.

WordStar, MailMerge, and SpellStar packages are available providing word processing capabilities, and Multiplan, an electronic spreadsheet package, is also available. Accounting applications are supported by Peachtree's integrated accounting system providing Accounts Payable, Accounts Receivable, and General Ledger.

□ Operating Systems

A version of MS-DOS is provided bundled into the basic system price of all Sperry Personal Computer models. MS-DOS Version 1.25 is included with Models 10, 20, 25, and 30, while MS-DOS Version 2.0 is included with Models 40, 45, and 50. Concurrent CP/M-86 is also optionally available for an additional fee.

MS-DOS 1.25 ● single-user, interactive, and batch processing disk operating system developed by Microsoft; has its equivalent in IBM PC-DOS 1.2 ● supports maximum diskette storage of 160K bytes in up to 64 different files in double-sided format; handles records from 1 to 65,546 bytes long in file transfers; executes external (disk-based) commands, giving the user ability to expand the DOS vocabulary to the limits of disk space ● includes batch processing capabilities with automatic execution on power up; user commands include DATA, TIME, DISKCOPY, FORMAT, RENAME, ERASE, COMP (compare), CHKDSK (check disk) ● innovations include a double File Allocation Table (disk map) with third memory-resident copy for efficient disk access, a disk mapping technique which conceptualizes conventional tracks and sectors as a single-dimensioned array of logical sectors, and allocation units which subdivide data section into 1, 2, 4, 8, 16, 32, 64, or 128 logical sector groups, eliminating disk external fragmentation typical of conventional track-sector mapping ● MS-DOS is divided into 4 parts: a device-independent I/O

handler, an I/O command processor, reference and jump vectors in low memory, and a command processor; the device-independent I/O handler on hidden file MSDOS.SYS is the core of MS-DOS through which I/O must be directed; the I/O processor physically moves data and instructions by means of hidden file IO.SYS as commanded by MSDOS.SYS; the command processor, using the COMMAND.COM program, is responsible for interface between user and MS-DOS, error trapping, batch file processing, interpreting user commands, and executing file names ● MS-DOS 1.25 is a predecessor of MS-DOS 2.00 ● bundled in basic system price on Models 10, 20, 25, and 30.

MS-DOS 2.00 ● single-user, interactive, and batch processing operating system with UNIX-like hierarchical directories, piping functions, filters, and hard disk support; equivalent to IBM PC-DOS 2.0 ● supports up to 180K bytes in up to 64 different files in single-sided format and up to 360K bytes in up to 112 files double sided, and 5M or 10M bytes with thousands of file names on hard disk; handles records from 1 to 65,535 bytes long in file transfer, executes external (disk-based) commands giving the user ability to expand the DOS vocabulary to limits of disk space ● batch processing capabilities with automatic execution on power-up, user commands include: DATE, TIME, COPY, ECHO, PATH, MKDIR, RMDIR, CHDIR, TREE, RECOVER, GRAPHICS, BREAK, and CTTY ● additions over DOS 1.25 in performance include hierarchical directories to facilitate hard disk use, numerous performance enhancements, redirection of input/output (I/O), piping of functions (sequentially rather than concurrently as in UNIX), higher sector density per track (9 sectors per track versus 8 in DOS 1.25), and installable device drivers ● MS-DOS is divided into 4 parts: a device-independent I/O handler, an I/O processor, reference and jump vectors in low memory, and a command processor; the device-independent I/O handler on hidden file MSDOS.SYS is the core of MS-DOS through which I/O must be directed; the I/O processor physically moves data and instructions by means of hidden file IO.SYS as commanded by MSDOS.SYS; the command processor, using the COMMAND.COM program, is responsible for interface between user and MS-DOS, error trapping, batch file processing, interpreting user commands, and executing file names ● MS-DOS 2.00 will read earlier MS-DOS diskettes; there are several unique system interrupt calls and file descriptors that make programs utilizing these features nontransportable between MS-DOS 2.00 and earlier versions ● an editor, debugger, and other utilities are provided ● bundled in basic system price on Models 40, 45, and 50.

Concurrent CP/M-86 ● a single-user, multitasking operating system that is compatible with CP/M-86 and MP/M-86 operating systems; provides a virtual console environment where each virtual console can be performing its own task; one virtual console is always mapped to the physical console and is the foreground console, with all other virtual consoles being background consoles; switching a virtual console to the physical console is accomplished through the use of function keys (typical installations use from 4 to 10 function keys for this process) ● supports up to 1M bytes of memory, multiple list devices, and up to 16 logical disk drives, each containing up to 512M bytes of storage for a maximum of 8G bytes of online storage ● features include: Real-Time Monitor providing process control and dispatching, as well as queue, flag, and clock management; allows processes to share reentrant code; file management with date and time stamping; and protection of user files and directories through the use of optionally assigned passwords ● requires an Intel 8086/8088 microprocessor, 256K bytes of memory (recommended), a console device, disk storage, and a real-time clock ● developed by Digital Research, Inc ● available for all models:

NA lcns

□ Data Management

Operating systems provide standard diskette/disk data manipulation. Currently, dBase II is the only DBMS available directly from Sperry. Various other data management facilities

LCNS: one-time license charge. NA: not available. Prices effective as of April 1984.

Sperry Personal Computer
Models 10, 20, 25, 30, 40, 45 & 50

are available from third-party vendors for use on the Sperry Personal Computer.

dBase II ● completely self-contained relational database management facility with built-in programming (command) language ● supports records (rows/tuples) with up to 1000 characters; records can be divided into up to 32 fields (columns/domains); fields can be up to 254 characters in length and are identified with up to a 10-character name; files can contain up to 65,535 records; and files can be indexed for easier accessing with an index key with a length of up to 100 characters ● supports all printable ASCII characters, and handles positive and negative numbers ● command language provides almost 70 commands partitioned into 10 functional groups: initial file creation/structure, existing file structure changes, field renaming, file operations (open, close, copy, etc), file organization (sort, merge, join, etc), edit/update/change, variables management, dialog management, search management, output management, and general programming controls (DO, IF, ELSE, etc) ● arithmetic operators include add, subtract, multiply, and divide, and are augmented with greater than/less than/equal to commands; Boolean operators include AND, OR, NOT, and substring inclusion operators ● reads files prepared by other language processors ● available for all models:

$700 lcns

☐ Communications/Networks

There are 4 different types of communications connectivity offered with the Sperry Personal Computer, each of which requires its own communications software and hardware adapter. The asynchronous adapter is standard on all models. All of the individual communications packages require a hardware interface card and a chassis slot (except for asynchronous standard port).

6384-00 Sperry UNISCOPE Emulation ● provides the capabilities for a Sperry Personal Computer to operate as a UNISCOPE editing terminal, communicating with a Sperry 1100 Series or OS/3-based mainframe system ● any existing editing terminal applications are able to communicate with the Personal Computer without modification ● requires hardware adapter card:

$630 lcns

6835-00 Binary Synchronous Communications ● provides the capabilities for a Sperry Personal Computer to emulate an IBM 3270 terminal to communicate with an IBM host application using modem and dial-up lines ● requires hardware adapter card:

630

6836-00 IBM SNA/SDLC Communications ● provides the capabilities for a Sperry Personal Computer to operate as a 3270 terminal which supports IBM SDLC protocols ● requires hardware adapter card:

630

Crosstalk ● provides the capabilities for a Sperry Personal Computer to operate as a teletype terminal, supporting access to various centralized data services such as Source and Dow Jones ● uses asynchronous adapter which is included with all models:

630

☐ Program Development/Languages

All Sperry Personal Computer models include as part of the basic system price the GW BASIC programming language. In addition, Microsoft's COBOL and FORTRAN are optionally available for an additional fee. Also available are 2 graphics library utilities which utilize the extensive graphics capabilities of the Sperry Personal Computer.

GW BASIC Interpreter ● implementation of Microsoft BASIC-86 ● provided dual-mode graphics capabilities in medium and high resolution; drawing statements are available for creating lines and circles or painting the screen; screen editor implements special function keys and multistatement lines ● allows calling of machine language subroutines, merging of multiple programs, and transferring control to specific program lines during certain events ● IF/THEN/ELSE constructs are supported as well as trace/notrace for easy debugging ● bundled into basic system price for all Models.

MS-COBOL ● ANSI standard and GSA validated ● supports advanced verbs; abbreviated and compound conditions; sequential, relative, and indexed files; ASCII, packed, and binary data formats; runtime assignment of file names; full copy facility; line sequential files; trace-style debugging; COMP-3 data format; program CHAIN and program segmentation; and formatted screen ACCEPT/DISPLAY with single command ● available for all models:

$750 lcns

MS-FORTRAN ● implements FORTRAN-77 ● includes double-precision arithmetic; long and short integers with selectable default integer length; capability for expressions to appear wherever allowed in the full standard (i.e., subscript); CLOSE statement; full form of OPEN statement; Hollerith data; formatted direct access files; unformatted sequential access files; ERR = specifier; compiler directives added to provide programmer with source text INCLUDE facility and back-slash edit for control for use in interactive I/O ● available for all models:

350

Business Graphics Library (BGL) ● provides a full business graphic program so that users can easily create their own bar charts, circle graphs, and line graphs to illustrate their business reports ● available for all models:

NA

Graphics Display Library ● provides graphics plotter support so that users can attach a high-quality graphic plotter to the Personal Computer ● available on all models:

NA

☐ Application Packages

A selection of some of the more popular packages is available from Sperry. In addition, it has an ongoing program to exercise packages and verify their applicability to the Sperry Personal Computer. The results of these exercises will be available to customers who wish to verify that a package will run before buying it.

WordStar ● a screen-oriented word processing system designed for novice computer users; initial text entry and revisions are displayed directly on the screen during typing as it will appear in print ● editing features include automatic text justification, paragraph indent and undent, simultaneous printing and editing, and dynamic page break display; text can be inserted, deleted, moved, copied, or read from files; a word or phrase can be found and replaced with revised text; print facilities provide boldface, double strike, underline, strikeout, subscripts/superscripts, variable character pitch, and variable line height; HELP messages, prompts, and menus are available as operator aids:

$495 lcns

MailMerge ● data/text file merging program used in conjunction with WordStar ● a multipurpose file merging program that handles word processing projects such as personalized form letters, invoices, mailing labels, and "boilerplate" legal documents; supports merging data from 2 or more files at print time; supports chained and nested printing, printing of multiple copies automatically, and printing data in report format:

250

SpellStar ● spelling checker used in conjunction with WordStar ● used to locate spelling and typing errors in word processing documents ● the program proofreads documents against a 20,000-word dictionary and flags each word not in the dictionary with a flashing cursor; the operator then has 3 choices: change the word, leave the word as is, or leave the word as is and add it to the dictionary so that it won't be flagged again:

250

Multiplan ● menu-driven spreadsheet program that provides planning, modeling, and forecasting capabilities ● supports linking worksheets, sorting, and solving problems via iteration; recalculates entire worksheet automatically when one number is changed ● provides business analysis and forecasting for areas such as cash flow analysis, budget planning and consolidation, pricing analysis, resource allocation, and merger analysis ● uses clear English commands and supports spreadsheets 63 columns

Sperry Personal Computer
Models 10, 20, 25, 30, 40, 45 & 50

wide and 255 rows deep ● available on all models:

_____ 275 _____

Peachtree Integrated Accounting ● online, modular, integrated accounting system that includes Accounts Payable, Accounts Receivable, and General Ledger ● modules run independently and can be purchased separately, but if all modules are installed, they are interactive ● designed for small to medium businesses supporting up to 100 vendors or customer invoices per day, 750 vendors or customers, and 100 departments ● includes an online tutorial ● available for all models:

_____ NA _____

Peachtree Accounts Payable ● maintains vendor master file using 6-digit numeric vendor number; maintains data on year-to-date purchases and payments, last check number, amount and date of payment to the vendor ● supports up to 8 account distributions per invoice; provides selective withholding of invoice payments by vendor or individual invoice; provides automatic payment of recurring items ● provides cash requirements report:

_____ 750 _____

Peachtree Accounts Receivable ● maintains receivable master file using 6-digit numeric vendor number ● supports both open item and balance forward accounting by customer; automatically applies open credits against unpaid invoices ● all products and transactions are related to general ledger accounts which provides the capability to automatically make all necessary account entries for month-end transfer to general ledger:

_____ 750 _____

Peachtree General Ledger ● maintains ledger file using 6-digit numeric chart of account code; supports departmentalized accounting of up to 99 departments ● maintains counts for current actuals and either prior year history by period or current year budget by period ● provides a complete array of financial reports with the user having control over column positioning, subtotalling, and line descriptions; master accounts create summary totals on a report followed by a detail supporting schedule of subaccounts; provides summary and detailed trial balances as well as departmental income statements ● includes a program to compute depreciation or amortization of assets:

_____ 750 _____

■ HARDWARE

□ Terms, Support & Documentation

Terms ● available on a purchase-only basis from the manufacturer through direct sales force and over 50 Sperry centers ● alternate distribution channels are also currently being examined with several expected to be set up in the near future.

Support ● 90-day warranty is provided, and the customer can elect to extend this up to a full year by taking an extension contract; following this, a yearly contract option is available ● OTC/CRS (Over The Counter/Customer Repair Service) provides users with the option to mail in or carry in products to over 50 specially equipped Sperry centers for service; mail and carry in are available under one contract covering all parts, labor, and unlimited usage for the life of the contract; on-call or time/charge service contracts are also available ● an 800 telephone number is provided to respond to telephone requests for assistance or information.

Documentation ● 3 manuals are provided with each system: Guide-to-Operations Manual, MS-DOS User Guide, and BASIC reference guide ● 2 tutorial diskettes are also provided: one explains how to use the Sperry Personal Computer and the other shows how to use the MS-DOS operating system ● in addition, a Technical Reference manual and a Servicing guide are available for purchase.

□ Physical Specifications (H x W x D); Weight

System Unit ● 6.0 x 18.0 x 16.5 inches; 26.1 pounds.

Monochrome Display ● 11.6 x 13.0 x 15.3 inches; 12 pounds.

Color Display ● 11.6 x 13.0 x 16.0 inches; 33 pounds.

Keyboard ● 17.5 x 1.5 x 7.6 inches; 4.8 pounds.

□ Systems Overview & Configurability

Sperry's Personal Computer is a 16-bit desktop business microcomputer. It uses the same architecture as IBM does on its PC and XT including the same I/O bus architecture, memory organization, disk/diskette format, operating system, look-alike keyboard, and graphics organization.

The Sperry Personal Computer is currently available in 7 models, all of which are based on the Intel 8088-2 processor, which is switch selectable to operate at 4.77 MHz or 7.16 MHz. All models include 128K bytes of memory, some type of disk storage, a screen and detachable keyboard, an asynchronous RS-232C serial port, and a time-of-day clock. The variations between the different models are the amount and type of disk storage and the type of monitor packaged with the systems. Seven expansion slots are provided on all models. These slots are used for attachment of peripheral controller cards and memory expansion. Because of the diskette/disk storage and the type of display, some of the slots are used. The slots available for user expansion for each of the models are as follows: 5 for Models 10, 20, and 25; 4 for the Models 30, 40, and 45; and 3 for the Model 50.

All models can be expanded to 640K bytes of memory by adding memory in 128K-byte increments. The first of these uses a chassis slot but includes a memory expansion board which accommodates 3 additional 128K-byte memory increments. Three monitors are available: a monochrome display, a medium-resolution color display, and a high-resolution color display which includes a graphics option. The display uses an expansion slot as does the graphics option.

One 320K-byte diskette drive is standard on the Model 10, while 2 are standard on the Models 20, 25, and 30, and one 360K-byte diskette drive along with a 10M-byte hard disk is standard on the Models 40, 45, and 50. The diskette controller uses one expansion slot and supports 2 drives, while the hard disk controller supports one drive and also uses an expansion slot.

Maximum configurability is stated below; minimum configurations are discussed under Packaged Systems.

Sperry Personal Computer System Maximums ● single user; 640K bytes of RAM and 20K bytes of ROM; 10.36M bytes of disk storage using single 10M-byte hard disk and single 360K-byte diskette drive or 640K bytes of diskette storage using dual 320K-byte diskette drives; serial or parallel printer.

□ Packaged Systems

Sperry Personal Computer

Basic System ● all Sperry Personal Computer models are 16-bit systems based on an Intel 8088-2 microprocessor and include 128K bytes of RAM, diskette/disk storage, a screen and keyboard, an asynchronous RS-232C communications port, time-of-day clock, 7 expansion slots, MS-DOS operating system, and GW BASIC language.

Model 10 ● includes all components of Basic System plus a 320K-byte 5.25-inch diskette drive and a monochrome display:

_____ **$2,643 prch** _____

Model 20 ● includes all components of Basic System plus 2 320K-byte 5.25-inch diskette drives and a monochrome display:

_____ **3,119** _____

Model 25 ● includes all components of Basic System plus 2 320K-byte 5.25-inch diskette drives and a medium-resolution color display:

_____ **3,338** _____

Model 30 ● includes all components of Basic System plus 2 320K-byte 5.25-inch diskette drives and a high-resolution color display:

_____ **3,773** _____

PRCH: purchase price. NA: not available. Prices effective as of April 1984.

Sperry Personal Computer
Models 10, 20, 25, 30, 40, 45 & 50

Model 40 ● includes all components of Basic System plus a 360K-byte 5.25-inch diskette drive, a 10M-byte 5.25-inch Winchester disk, and a monochrome display:

<div align="right">5,099</div>

Model 45 ● includes all components of Basic System plus a 360K-byte 5.25-inch diskette drive, a 10M-byte 5.25-inch Winchester disk, and a medium-resolution color display:

<div align="right">5,318</div>

Model 50 ● includes all components of Basic System plus a 360K-byte 5.25-inch diskette drive, a 10M-byte 5.25-inch Winchester disk, and a high-resolution color display:

<div align="right">5,753</div>

☐ CPU

All Sperry Personal Computer models are based on Intel 8088-2 microprocessor. Using a switch-selection capability, the 8088-2 can operate at 4.77 MHz or 1.5 times faster at 7.16 MHz.

Intel 8088-2 Processor ● 8-bit data bus interface, 16-bit internal architecture, direct addressing to 1M bytes of memory, 16-bit register set with symmetrical operations, approximately 70 basic instructions with up to 30 addressing modes, 8-bit and 16-bit signed and unsigned arithmetic with binary and decimal operands, extensive string and block move facilities ● powerful segmentation facilities allow memory partitioning for multitasking, concurrent, or multiuser capabilities ● a pseudo-superset of the Intel 8080 instruction set where translation to 8088 is straightforward ● instruction set compatible with 8086.

Time-of-Day Clock/Calendar ● included with all Sperry Personal Computers ● allows the system to automatically stamp each file with the current date setting ● includes a battery backup which allows the clock to run for 40 days while the system is turned off.

☐ Memory

All models of the Sperry Personal Computer support up to 640K bytes of memory, of which 128K bytes are packaged with all models on the motherboard. Expansion from the packaged 128K bytes is accomplished by the addition of 128K-byte increments. The first of these increments includes an expansion board that will accommodate up to 3 additional 128K-byte increments for the system total of 640K bytes. The expansion board requires one of the system expansion slots, but all 4 128K-byte increments thus require only one additional slot. All models also include 20K bytes of ROM providing a power-on confidence test that verifies proper operation of the unit, and the Basic Input/Output System (BIOS) which controls data transfer within the system to peripherals.

F4216 128K-Byte Add-On Memory ● cycle time is 270 nanoseconds; access time is 150 nanoseconds:

<div align="right">$465 prch</div>

F4215-00 Memory Expansion Board ● required for first add-on 128K-byte memory add-on ● handles 4 add-on memory boards:

<div align="right">301</div>

☐ I/O & Communications

All Sperry Personal Computer models provide from 3 to 5 chassis slots, depending on the model, for attachment of I/O and communications devices, as well as a built-in RS-232C serial adapter for asynchronous operations. All peripherals and memory expansion require the use of a chassis slot, with the high-resolution color graphics display requiring 2. The diskette controller requires only 1 slot but supports 2 diskette drives. Optional synchronous communication adapters are available providing connection to Sperry 1100 series or OS/3-based mainframes, and IBM adapters supporting bisynchronous as well as SNA/SDLC communications. All of these adapters require a chassis slot. To use any of the communications interfaces, including the built-in asynchronous interface, requires additional software.

F4213-00 Sperry UNISCOPE Adapter ● provides the hardware interface which allows any Sperry Personal Computer model to communicate with a Sperry 1100 Series or OS/3-based mainframe system; personal computer operates as a UNISCOPE editing terminal where existing terminal applications are able to communicate with the personal computer without modifications ● requires UNISCOPE emulation software:

<div align="right">$276 prch</div>

Binary Synchronous Adapter ● provides the hardware interface which allows any Sperry Personal Computer model to emulate an IBM 3270 and to communicate with an IBM host application using modem and dial-up or leased lines ● requires Binary Synchronous communications software:

<div align="right">276</div>

IBM SNA Adapter ● provides the hardware interface which allows any Sperry Personal Computer to operate as an IBM 3270 terminal that supports SNA/SDLC protocols ● requires IBM SNA Communications software:

<div align="right">276</div>

☐ Mass Storage

All models in the Sperry Personal Computer line are packaged with at least a single diskette drive. On the Models 10, 20, 25, and 30, using MS-DOS Revision 1.25, the diskette drive provides 320K bytes of storage; while on the Models 40, 45, and 50, using MS-DOS Revision 2.0, the diskette drive provides 360K bytes of storage. The Models 20, 25, and 30 include an additional diskette drive, while the Models 40, 45, and 50 include a 10M-byte Winchester drive. The diskette controller, which handles 2 diskette drives, requires one of the 7 chassis expansion slots, as does the hard disk controller. As of this writing, 2 drives of dual diskette or single diskette and single hard disk are the maximum supported, and no models support a tape drive.

Diskette Drive ● 320K-byte capacity (MS-DOS 1.25) or 360K-byte capacity (MS-DOS 2.0); 512K bytes per sector; 8 (MS-DOS 1.25) or 9 (MS-DOS 2.0) sectors per track; 48 tracks per inch, 40 tracks per surface, and 2 surfaces ● 250K-bps data transfer rate ● single diskette standard on Models 10, 40, 45, and 50; dual drives standard on Models 20, 25, and 30 ● available as an add-on to upgrade a Model 10 to a 2-diskette drive system:

<div align="right">$482 prch</div>

10M-Byte Winchester ● 10M-byte capacity; 512 bytes per sector; 17 sectors per track; 612 tracks per surface; and 2 surfaces ● average access time of 155 milliseconds; and 5M-bps data transfer rate ● single drive standard on Models 40, 45, and 50 ● available as an add-on to upgrade a Model 10:

<div align="right">NA</div>

☐ Terminals/Workstations

All of Sperry's Personal Computers are packaged with a display and keyboard. The displays are available in 3 types: a Monochrome display included with Models 10, 20, and 40; a Medium-Resolution Color Display included with Models 25 and 45; and a High-Resolution Color Display included with Models 30 and 50. The high-resolution color display includes high-resolution color graphics capabilities. All displays require one of the expansion slots, and the high-resolution color display with graphics requires 2. The IBM look-alike keyboard is the same for all models. The monochrome display includes a printer control feature for connection of a printer without requiring a printer interface controller.

Monochrome Display ● standard on Models 10, 20, and 40 ● 12-inch diagonal display; 2000 characters, 80 characters x 25 lines; 7x9 dot character size in a 9x14 dot character block ● standard character set of 256 different characters made up to 96 ASCII graphic characters, symbols for word processing, and business graphics ● includes a 4K-byte display buffer and an industry-standard Centronics printer interface ● bundled with Models 10, 20, and 40 system price.

Medium-Resolution Color Display ● standard on Models 25 and 35 ● 15-inch diagonal display; 1000 or 2000 characters, 40 or 80 characters by 25 lines; 5x7 dot character size in an 8x8 dot character block ● standard character set of 256 different characters made up to 96 ASCII graphic characters, symbols for

Sperry Personal Computer
Models 10, 20, 25, 30, 40, 45 & 50

word processing, and business graphics ● graphics resolution of 320x200 or 640x200 pixels; up to 16 colors are displayable ● includes a 16K display buffer ● bundled with Models 25 and 45 system price: available as an add-on for Models 10, 20, and 40:

$220 prch

High-Resolution Color Display ● standard on Models 30 and 50 ● 12-inch diagonal display; 1000 or 2000 characters, 40 or 80 characters by 25 lines; 7x14 dot character size in an 8x16 dot character block ● standard character set of 256 different characters made up of 96 ASCII graphic characters, symbols for word processing, and business graphics ● graphics interface provides selectable character resolution of 320x200 (IBM compatible), 320x400, 640x200, or 640x400 pixels; up to 16 colors from a possible choice of 256 colors can be displayed in the 640x200 or 640x400 resolution modes ● includes a 256K-byte display buffer which allows both graphics and text data to be intermixed and displayed together ● bundled with Models 30 and 50 system price ● available as an add-on for all other models:

622

F4206 Medium-Resolution Color Controller:

220

F4207 High-Resolution Color Controller:

472

Keyboard

84-Key IBM Look-Alike Keyboard ● standard on all models ● a detached, sculpted keyboard that looks like IBM's keyboard but includes some improvements such as: numeric lock and caps lock have indicators, enter key is larger and placed next to numeric pad for ease of operation, and the return key is in the standard typewriter position ● provides 84 keys for data and text entry, a calculator-like numeric keypad which is used for cursor control, and 10 separate function keys ● attaches through a recoiling cord ● bundled into all models' system price.

☐ Printers/Graphics

Currently available from Sperry for attachment to all models are the Sperry Model 5 dot-matrix printer and the Sperry Model 31 letter-quality printer. Both attach through a Centronics-compatible printer interface, which is built into the Monochrome display, or is available as a separately priced item on the models with a color display. If the separate interface is used, it requires one chassis expansion slot.

Model 5 ● 100-cps, 9x9 dot-matrix printer ● supports 40, 48, 68, 80, 96, or 137 characters per line and dot densities of 480, 640, 720, 960, or 1920 dots per 8 inches ● provides 235 total printable characters ● requires printer interface for those models without a monochrome display which includes printer interface:

$545 prch

Model 31 ● daisywheel letter-quality printer:

NA

Printer Interface ● provides an industry-standard Centronics-compatible interface for attachment of Sperry or independent vendor-supplied printers; can be attached to all models of the Personal Computer ● required on those models that do not have a monochrome display; the monochrome display has the printer interface included ● requires one of the chassis slots:

135

● **END**