NCR 7500 Series Systems

MANAGEMENT SUMMARY

NCR's 7500 Series is a family of modular terminal systems with a mix-and-match assortment of hardware and control logic modules that permits the user to select the precise combination of components needed now, and to add additional elements later. Any 7500 Series system can operate on-line as an intelligent batch terminal and off-line as a data entry workstation or desktop computer, depending on the hardware/logic configuration selected. Control logic is provided for four types of applications: cassette- or diskette-based data entry, media conversion, bisynchronous batch data communications, and local user program development and processing.

Three models (7510, 7520, and 7530) provide for cassette-based, diskette-based, or multi-media operation on progressively enhanced levels of sophistication. Each model's configuration starts with a CRT display, a keyboard, a controller, and a cassette or diskette drive; additional peripherals can be added as needed. The 7500 Series peripherals include a single or dual magnetic tape cassette drive, single or dual diskette drive, and either an 800 or 1600 bpi ½" magnetic tape drive, all of which are industry-compatible, and a 50-, 70-, or 125-lpm printer.

Each system's "personality" (data entry, communications, media conversion, or program processing) is molded by loading preprogrammed logic modules from diskette or cassette into the system's RAM memory; its "personality" can be changed simply by loading a new module. Since the RAM memory is volatile, control logic must be reloaded upon each power-up.   ▷

NCR's 7500 Series, unveiled in 1978, is a family of multi-purpose intelligent terminal systems. Three model configurations are available, including the 7530, shown here. Applications range from a remote batch workstation to a desktop small business computer.

The 7500 Series is a family of single-station intelligent terminals that support cassette- or diskette-based data entry, media conversion, and bisynchronous batch mode data communications. An assortment of hardware and control logic modules allow the user to select the combination of components needed now, and to add additional components later.

MODELS: 7510, 7520, 7520 SBS, 7520 R&M, and 7530.
CONFIGURATION: A configuration's capabilities is determined by its set of hardware and control logic modules. Basic components include a microprocessor-based controller with 48K bytes of volatile RAM, a 9-inch or 12-inch CRT display with keyboard, and a cassette or diskette module. Other peripherals available for use with members of the 7500 Series include 50/75/125 lpm matrix printers, half-inch magnetic tape drives, and an OCR-A font tag and label printer.
SOFTWARE: An NCR-enhanced version of Basic, the Basic +6 interpreter, is included. A bisynchronous communications module for IBM 2780/3780 emulation is available.
COMPETITION: Cado System 20, Computek Display 8, IBM 5280, and various others.
PRICE: A basic 7510 configuration including a 9-inch display, detachable keyboard, Basic +6 software, and single 15 ips cassette tape drive is priced at $6,815. A more sophisticated 7530 configuration including a 12-inch display, detachable keyboard, Basic +6 software, dual 15 ips cassette tape drive, and 75 lpm printer is priced at $13,675.

CHARACTERISTICS

VENDOR: NCR Corporation, 1700 S. Patterson Blvd., Dayton, OH 45479. Telephone (513) 445–1003.

DATE OF ANNOUNCEMENT: June 1978.

DATE OF FIRST DELIVERY: Model 7510—July 1978; Model 7530—October 1978; Model 7520—August 1979.

NUMBER DELIVERED TO DATE: Over 800 systems (all models).   ▶

▷ A non-expandable 48K-byte RAM memory is provided on each 7500 Series system. Of the 48K bytes, 20K bytes are available for processing of user programs, 24K bytes are occupied by the preprogrammed logic modules, and 4K bytes are dedicated to system requirements. User programs are developed and processed using an NCR version of Basic, which NCR has dubbed Basic +6. Like the other logic modules, the Basic +6 interpreter is loaded into the system from cassette or diskette. Unlike the other logic modules, which can be copied on to a user-supplied cassette or diskette for no charge at NCR field offices and are supported by the 7500 Series field engineering group, the Basic +6 module is separately priced and distributed and supported through NCR's corporate field support group.

The data entry module provides a menu-driven parameterized language designed for basic formatted data entry. A simple worksheet is provided for preparation of each format. In addition to basic data entry logic, the module contains a number of features similar to those provided on sophisticated key-to-disk systems, such as operator prompting, enhanced file searching, totals accumulation, data processing operations (arithmetics, moves, clears, etc.), check digit generation/verification, direct addressing of a specific level of a multi-level format program, and constants storage/insertion. However, so that users who do not need an enhanced level of operation do not end up paying for it, NCR individually "locks out" each of these features unless the user selects the extra cost "key" to enable that particular feature.

The media conversion module permits conversion from one media to another, one record or one file at a time. With the Match On option, it can also provide selective copying of records from one peripheral to another under control of a user-designed mask, which can filter out any non-essential data. By copying only that data which is to be read, transmitted, or received, savings in communications charges, computer time, and peripheral device utilization may be significant. The module provides operator prompts by which the user can specify record length, block size, and data code separately for the input and the output media; the conversion program handles changes in record length, blocking/unblocking, and code translation automatically. Basic cassette-based or diskette-based conversion logic is provided for the two smaller models. An enhanced version is provided for the multi-media configuration, and permits conversion from/to virtually any of the system's components.

The bisynchronous communications module provides batch mode IBM 2780/3780 emulation for communications with all NCR and non-NCR systems that support 2780/3780 protocol. Included in its logic is the ability to dump transmitted/received data to the printer.

NCR offers two specialized system packages for the 7520 system: the Small Business System package, and the Receiving and Marking System package. The SBS package includes a 12-inch CRT, keyboard, dual diskette drive, and either a 50-, 70-, or 125-lpm printer. Users have access to a ▷

▶ SERVICED BY: NCR.

CONFIGURATION

The NCR 7500 Series is a family of multi-purpose systems that can be configured as remote batch terminal workstations, user-programmable terminals, or stand-alone small business computers. The family's design concept is modular, and hardware and control logic components can be mixed-and-matched to fulfill each user's requirements. As the user's needs change, the system can be expanded in the field, within the limits of the selected configuration.

The 7500 Series is available in three model configurations, each providing a progressively more sophisticated level of operation. The basic components in each configuration include a microprocessor-based system controller containing 48K bytes of RAM memory, an integral 9-inch CRT display with a screen capacity of 512 characters, a detached keyboard selected from one of three styles, and a cassette or diskette module. An optional 12-inch, 2000-character CRT display is available for any 7500 configuration.

In addition, each configuration supports a unique set of hardware and control logic modules that determines its range of capabilities:

Model 7510—provides support for a single ANSI/ECMA magnetic tape cassette drive, which can optionally be expanded to a dual drive. Control logic modules support key-to-cassette data entry, cassette-to-cassette or cassette-to-printer media conversion, cassette-oriented data processing, 2780/3780 bisynchronous communications, and ACH print files.

Model 7520—provides support for a single industry-standard diskette drive, which can optionally be expanded to a dual drive. A ½-inch magnetic tape drive can also be added to the 7520. Control logic modules include enhanced key-to-diskette data entry that permits sequential or direct access filing; diskette-to-diskette, diskette-to-tape, or diskette-to-printer media conversion; diskette-oriented data processing, and 2780/3780 bisynchronous communications.

Model 7530—provides support for a single ANSI/ECMA magnetic tape cassette drive, which can optionally be expanded to a dual drive. Both a ½-inch magnetic tape drive and a single or dual diskette drive can be added to the 7530. Control logic modules include key-to-cassette and key-to-diskette data entry; enhanced media conversion capabilities from/to all appropriate hardware components; cassette- or diskette-oriented data processing; 2780/3780 bisynchronous communications; and ACH communication to magnetic tape.

One of three line printer models can be added to any 7500 configuration. The line printers range in speed from 50 to 125 lpm; two models provide either non-stylized or OCR-A printing. An OCR-A Font, Tag, and Label strip printer is available on the 7520 system.

User-programming is supported on two levels. A parameterized data entry language is provided for data recording and verification. General purpose user-written programs can be developed and run locally via NCR's Basic +6 interpreter.

A bisynchronous communications adapter with supporting control logic module is available on all models and permits the 7500 to communicate with an NCR or non-NCR mainframe as a remote batch entry workstation in IBM 2780/3780 mode. Point-to-point communications are also supported with another 7500 Series system in batch mode. The bisynchronous communications module also allows off-line ▶

▷ library of optional preprogrammed application packages, including payroll, general ledger, accounts receivable, accounts payable, and fixed asset accounting. The Receiving and Marking package is aimed at the retail industry, and can be used in conjunction with the NCR 6448 OCR Tag and Label Printer.

COMPETITIVE POSITION

The NCR 7500 Series competes with other multi-function intelligent terminal systems, such as the Cado System 20/ 20, Computek Display 8, IBM 5280, and others. The range of configurations available on the 7500 Series is helpful in this market.

ADVANTAGES AND RESTRICTIONS

Introduced in 1978, the 7500 Series is a mature product line, and this in itself places some restrictions on it. The 7500 provides only 48K of volatile RAM, features limited communications emulation (IBM 2780/3780 BSC only), and has limited storage options. However, it is a low-cost system and bears the NCR name, which provides it with a great deal of acceptance. Although Datapro received an insufficient number of user responses in the 1983 Terminal Users' Survey to include a User Reaction section in this report, previous user responses on the 7500 Series showed a high degree of user satisfaction with the product line. □

▶ printer from cassette, diskette, or ½-inch magnetic tape to the printer. Federal Reserve Automatic Clearing House (ACH) communication is also supported on the 7530 Magnetic Tape Systems.

TRANSMISSION SPECIFICATIONS

Point-to-point or multipoint operation is supported for communications with an NCR or non-NCR host computer. Point-to-point 7500 Series to 7500 Series communications is also supported. Data is transmitted synchronously in half-duplex mode in blocks of up to 512 characters. Transmission speed is user-selectable at rates of 2400 or 4800 bps; 9600 bps transmission (local only) is also supported for communication from diskette or magnetic tape media. Either ASCII or EBCDIC code may be transmitted. Translation of data stored in EBCDIC into ASCII transmission code, and vice versa, can be performed "on the fly." The bisynchronous communications adapter option includes an RS–232–C interface.

Bisynchronous communications control logic modules can be configured for use by a 7500 communicating with other NCR systems to feature NCR's Century-based bisynchronous protocol, which contains many, but not all, features of IBM 2780/3780 message formatting, or to provide IBM 2780/3780 emulation compatible with other vendor's systems.

The 7530 Automated Clearing House (ACH) Communication System provides bisynchronous communications, over lease or dial-up lines, at speeds of 2400 or 4800 bps.

SOFTWARE SUPPORT

Each 7500 Series system is equipped with an Intel 8080 microprocessor that provides basic operating logic. Firmware control logic modules (available from NCR at no extra charge) are loaded from cassette (Models 7510 and 7530) or diskette (Models 7520 and 7530) to implement data entry,

media conversion, and data communications. An enhanced Basic interpreter is provided for general purpose user-programming.

The data entry module supports menu-driven multi-level data recording and verification via cassette (Models 7510 and 7530) and diskette (Models 7520 and 7530). Standard module functions include data entry/verification, format entry/verification, cassette/diskette reading/writing, copying to the printer, sequential access filing, direct access filing (diskette-based data entry only), writing/deleting file marks, specifying record length (up to 256 characters), record deletion, etc. The module provides a parameterized language for creation of fill-in-the-blanks formats.

Format characteristics are specified using a simplified worksheet. Standard parameters permit the user to designate each fields's length (up to 255 characters), characteristics (zero-fill/space-fill, alpha/numeric, right/left justify, etc.), and entry/verification requirements (must/may fill, bypass, skip, duplicate, etc.), and to specific multi-record block length (up to 512-character blocks). Multiple formats may be stored on a single cassette/diskette.

Separately-priced optional functions can be added to the basic data entry support provided by NCR. These include Operator-Lead-Through (OLT), which provides user-written prompts of up to 18 characters in length to aid the operator in entering data; Search-On, which permits the file to be searched for a specified record or format number, end-of-file or end-of-data mark, or mask; Accumulator Controls, which provide 2, 4, 8, or 12 accumulators for totalling; Operations Controls, which permit 1, 2, 4, or 7 different operations, such as add, subtract, batch transfer, move, perform check digit generation or verification, or clear total, to be performed on data in a specified field or accumulator; Check Digit, which allows up to three different check digit formulas to be specified per program; Direct Level Addressing, which permits the operator to access a particular level in a multi-level format program; Constants Table, from which user-specified constants can be selected for insertion into a data field or accumulator; and Multiply/Divide, which permits quantity and amount extensions during data entry.

A user memory of 512 bytes is provided for format program processing. Optionally the format program memory can be expanded to 1024 or 2048 bytes.

The media conversion module permits conversion from one media to another, one record or one file at a time. With the Match-On option, it can also provide selective copy of records under control of a user-designed mask. An operator sign-on procedure permits the user to specify record length, block size, and data code separately for the input and output media; the conversion program handles changes in record length, block/unblocking, and code translation automatically. Media conversion support for Model 7510 permits cassette-to-printer or cassette-to-cassette transfer. Model 7520 supports diskette-to-printer, diskette-to-tape, or diskette-to-diskette conversion. Model 7530 provides enhanced media conversion functions that essentially permits conversion from any one magnetic media (cassette, magnetic tape, or diskette) or from the screen, to any other magnetic media or the printer.

In addition to providing the data communications support described in Transmission Specifications above, the bisynchronous communications enables "dumping" of data from the cassette, diskette drive, or magnetic tape to the printer.

NCR provides an enhanced version of the Basic programming language, which it calls its Basic +6 interpreter, for ▶

user programming and local processing. The interpreter occupies 24K bytes of user memory; an additional 20K bytes are available for user programs. The interpreter is available in two versions: cassette-oriented (for use with Models 7510 and 7530) and diskette-oriented (for use with Models 7520 and 7530). Programs written in Basic +6 can perform a full range of data processing operations, including transaction recording, arithmetic and logical manipulation, file management, sorting, and report printing. In order for Basic +6 software to be implemented, two hardware options are required: the Basic +6 Enable Kit on the controller; and either the Basic +6 keyboard or the typewriter-style keyboard with the Basic +6 conversion kit.

A full complement of preprogrammed diskette-stored business applications programs is available from Data Train, Inc. (Grants Pass, OR) for use with Model 7520 Small Business System. Programs are currently available for fixed asset accounting, accounts receivable, accounts payable, payroll, and general ledger applications.

When the 2000-character CRT display is used with Basic +6 programs, the entire screen can be utilized. However the data entry, media conversion, and bisynchronous communications firmware only utilize a 32-character wide by 16 line deep area of the upper left portion of the 12-inch screen for data display; in addition the upper right corner can be used to display the menu.

COMPONENTS

DISPLAY: Two CRT displays are available with the 7500 Series: a 9-inch (diagonal measurement) monitor with a screen capacity of 512 characters, arranged in 16 lines of 32 characters; and a 12-inch monitor with a screen capacity of 2000 characters arranged in 25 lines of 80 characters. A 64-character ASCII displayable character set including upper case alphabetics is standard on the 9-inch CRT; a 128-character set with upper and lower case alphabetics and displayable control codes is optional on the 9-inch CRT and standard on the 12-inch CRT. Characters are formed by a 5-by-7 dot matrix. Field-addressable display attributes include high/low intensity and (12-inch screen only) reverse video.

KEYBOARD: Three detachable keyboards are offered for use with the 7500 Series: a keypunch-style keyboard with an 11-key numeric pad, a typewriter-style keyboard with an 11-key numeric pad, and a Basic +6 keyboard with 11-key numeric pad. The Basic +6 keyboard is required for NCR's Basic +6 software; keypunch and typewriter keyboards are used with the NCR firmware modules. However, NCR provides kits that permit field-installed conversion of the typewriter-style keyboard to the BASIC+6 keyboard and vice versa. Each keyboard generates the full 128-character ASCII set.

MAGNETIC TAPE CASSETTE DRIVE: A single or dual freestanding drive that supports ANSI/ECMA compatible cassettes. Data is recorded in ASCII code. Maximum block size is 512 characters. Read/record speed is 75 or 15 ips. Single-side capacity is 272,384 characters when using a 1.2-inch inter-record gap, 512-character block, and a 282-foot tape. Cassettes produced by the 7500 Series are compatible with NCR mainframes via a common trunk peripheral, the NCR 7649 General Purpose Peripheral Controller, or via the Century 8350 cassette reader. The standard method of cassette input (i.e., NCR 636) may be continued as a cassette device.

DISKETTE DRIVE: A single or dual freestanding drive that supports industry-standard formatting and initializa-

tion via single-side/single-density 8-inch diameter diskettes. Data is recorded in ASCII or EBCDIC code. Each diskette can hold 243K bytes, resulting in a total dual drive capacity of 486K bytes. Diskettes are compatible with NCR computers via a common trunk peripheral, the NCR 7649 General Purpose Peripheral Controller. If the host mainframe is an N-8400, or an I-8400 with the "N" option installed, diskettes may be read directly into the system via the integrated firmware loader.

MAGNETIC TAPE: (½-INCH): Two 9-track industry-compatible magnetic tape drives are available, an 800 bpi NRZ drive and a 1600 bpi PE drive. Either drive can utilize ASCII or EBCDIC code, which is selectable by the operator. Maximum block size is 2048 characters. Maximum drive capacity is 4,198,400 characters (800 bpi drive) or 6,871,040 characters (1600 bpi drive), when using a .6-inch inter-record gap, 2048-character block, and 540-foot tape. Connection to a 7500 System requires two optional interfaces, one on the 7500 and one on the tape drive.

MATRIX PRINTER: Three line printers, Models 6440-0202, -0302, and 0402, which print at rates of 125, 70, and 50 lines per minute respectively, are offered for use with the 7500 Series. Printing width is 132 columns. The standard character set contains 64 characters (no lower case alphabetics), which are printed using a 7-by-7 dot matrix. Optionally, Models -0202 and -0302 offer a 96-character set (including lower case alphabetics) that utilizes a 9-by-7 dot matrix; this option requires the Upper/Lower Case feature on the 7500 controller. Models -0202 and -0302 also offer a 64-character OCR-A character generator, which prints OCR characters using a 9-by-9 dot matrix. OCR printing reduces the rated speed of the Model -0202 to 75 lpm, and of the Model -0302 to 40 lpm. Models -0202 and -0302 also offer an optional audible alarm. Model -0302 provides an optional compressed pitch feature that permits the operator to select 6 lpi or 8 lpi vertical spacing. Models -0302 and -0402 provide an optional tear bar kit. Connection to a 7500 system requires two optional interfaces, one on the 7500 and one on the printer.

OCR-A TAG & LABEL PRINTER: The Model 6448 OCR-A Printer prints merchandise labels and tags under the communications control of a parent unit. Any controlling unit that communicates through a standard EIA RS–232–C or CCITT V.24 interface can input data to the printer. The 6448 prints up to 32 OCR-A/B characters per line on 4-line ticket media. Two models are available. One model permits asynchronous point-to-point communications and allows one printer per control unit. The second model permits asynchronous multi-point communications and allows for up to eight printers per control unit. A 6-line version of the 6448, for point-to-point or pollable environments, has been added. This unit prints 4 lines of OCR-A and 2 lines of non-OCR-A print. Transmission rates for the 6448 range from 110 to 9600 bps. Average print speed is 150 tickets per minute (10 characters per line). Single or multiple-part tickets are accommodated.

PRICING

NCR 7500 Series components are available for purchase or can be rented on a one-, three-, or five-year rental plan. Volume discounts are available; contact NCR for details. Monthly maintenance is included in rental plans; a separate maintenance contract is available for purchased units. Control logic modules for data entry, communications, and media conversion are available at no extra charge from NCR field offices for copying onto a user-supplied cassette or diskette. The Basic +6 interpreters and applications program packages are separately priced.

NCR 7500 Series Systems

		Monthly Charge*				
		1-Year Rental	3-Year Rental	5-Year Rental	Purchase	Annual Maint.
7510	System Control Unit; includes 48K-byte RAM, CRT display, cassette recorder interface, and firmware modules for data entry, media conversion, and bisynchronous data communications; requires 7620 cassette recorder and 5850 keyboard					
	Model 3107; 9-inch display	$172	$165	$151	$4,200	$430
	Model 3607; 12-inch display	209	200	183	4,995	558
7520	System Control Unit; includes 48K-byte RAM, CRT display, and firmware modules for data entry, media conversion, and bisynchronous data communications; requires 7642 diskette drive with interface and 5850 keyboard					
	Model 0207; 9-inch display	154	148	135	3,845	359
	Model 2707; 12-inch display	178	170	153	4,575	449
	Small Business System Package; 50 lpm printer	593	565	510	9,195	1,781
	Small Business System Package; 70 lpm printer	625	596	537	11,240	2,035
	Small Business System Package; 125 lpm printer	664	634	570	13,190	2,114
	Receiving & Marking System Package	444	426	389	10,910	1,212
7530	System Control Unit; includes 48K-byte RAM, CRT display, cassette recorder interface, and firmware modules for data entry, media conversion, and bisynchronous data communications; requires 7620 cassette recorder and 5850 keyboard					
	Model 3307; 9-inch display	193	184	166	4,475	400
	Model 3907; 12-inch display	228	217	196	5,225	562

Options

		1-Year Rental	3-Year Rental	5-Year Rental	Purchase	Annual Maint.
	128 ASCII Character Set; for 9-inch displays only	7	6	5	130	15
	Bisynchronous Communications Adapter	43	41	37	1,150	190
	Operator Lead Through	6	5	4	105	15
	Search-On	6	5	4	105	15
	2 Accumulator Controls plus 1 Operations Control	31	30	26	740	63
	4 Accumulator Controls plus 2 Operations Controls	47	45	41	1,060	104
	8 Accumulator Controls plus 4 Operations Controls	56	54	48	1,270	127
	12 Accumulator Controls plus 7 Operations Controls	60	57	52	1,380	143
	3 Check Digit Generator/Verification Schemes	18	16	14	425	32
	Direct Level Addressing	10	9	8	210	24
	Constants Table (includes Search-On)	18	16	14	425	48
	Match On	6	5	4	105	15
	Multiply/Divide	13	12	11	210	15
	Basic +6 Enable Kit; required for implementation of Basic +6 software	—	—	—	10	—
	Upper/Lower Case; required for implementation of the 96-character set on an attached 6440 printer	—	—	—	10	—
	Format Memory Expansion; increases format memory from 512 bytes (standard) to 1024 bytes	8	7	6	160	24
	Format Memory Expansion; increases format memory from 512 bytes (standard) to 2048 bytes	18	16	14	425	56

Peripherals

|		1-Year Rental	3-Year Rental	5-Year Rental	Purchase	Annual Maint.
5850	Keyboards					
	Keypunch-style with 11-key numeric pad	16	15	14	475	71
	Typewriter-style with 11-key numeric pad	16	15	14	475	71
	Basic +6 keyboard with 11-key numeric pad	16	15	14	475	62
	Conversion Kit; permits conversion of typewriter-style keyboard to Basic +6 keyboard	—	—	—	70	—
	Conversion Kit; permits conversion of Basic +6 keyboard to typewriter-style keyboard	—	—	—	70	—

*Includes maintenance

NCR 7500 Series Systems

		Monthly Charge*				
		1-Year Rental	3-Year Rental	5-Year Rental	Purchase	Annual Maint.
7620	Magnetic Cassette Tape Drives; 15 ips; 7510 & 7530 only					
	Single Drive	$44	$40	$38	$1,340	$184
	Dual Drive	88	80	76	2,385	393
7642	Diskette Drive; includes interface; 7520 & 7530 only					
	Single Drive	124	118	106	2,490	415
	Dual Drive	149	142	127	3,350	490
7330	Half-inch Magnetic Tape Drives; 7520 & 7530 only					
	800 bpi NRZ Tape Drive	263	252	228	8,000	782
	1600 bpi PE Tape Drive	407	388	350	12,000	1,021
	Tape Drive Interface	6	5	4	125	15
	7500/7330 Interface	21	20	18	500	84
6440	Line printer; 64-character set using 7-by-7 dot matrix					
	Model 0202; 125 lpm	257	246	222	6,800	949
	Model 0302; 70 lpm	216	207	186	4,790	870
	Model 0402; 50 lpm	183	174	158	4,115	617
	7500 Interface; requires Printer Interface	42	36	—	750	114
	Printer Interface; includes cable	20	19	17	500	57
	96-Character Set using 9-by-7 Dot Matrix; in lieu of standard character set & matrix; Models 0202 and 0302 only; requires Upper/Lower Case feature on Control Unit	4	4	4	105	—
	64-Character OCR-A Font set and character generator; in lieu of standard character set & matrix; Models 0202 and 0302 only; requires 9-by-9 Overlapping Dot feature	6	6	6	160	—
	9-by-9 Overlapping Dots; Model 0202 only	85	81	73	2,000	238
	9-by-9 Overlapping Dots; Model 0302 only	51	49	44	1,200	143
	Audible Alarm; Models 0202 and 0302 only; also includes 6/8 lpi Compressed Pitch feature for Model 0302 only	5	5	5	115	—
	Tear Bar Kit; 8½-inch; Models 0302 and 0402 only	9	9	9	90	—
6448	OCR-A Font Tag & Label Printer					
	6-line Point-to-Point	361	361	361	8,200	1,053
	6-line Pollable	383	383	383	8,700	1,117
	4-line Point-to-Point	327	327	327	7,700	835
	4-line Pollable	348	348	348	8,200	899
	Cutter/Stacker/Power Take-Up	59	59	59	1,400	134

	Monthly License*	One-Time License	Annual Maint.
Software			
Basic +6 Interpreter—			
Cassette-based; for 7510/7530	$29	$800	T/M
Diskette-based; for 7520/7530	35	800	T/M

*Includes maintenance ■

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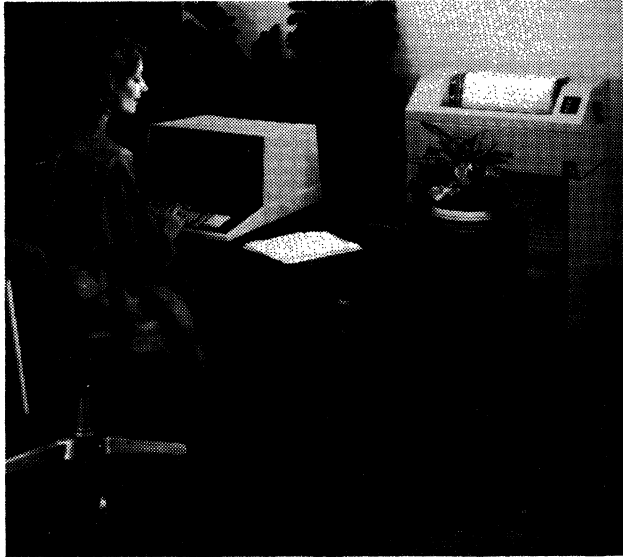
The NCR 7520 Small Business System package offers data and information processing capabilities to the small business user. System components include a CRT/processor, keyboard, dual-drive flexible disk module, Model 6440 matrix printer, and the BASIC +6 software interpreter.

MANAGEMENT SUMMARY

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Three models (7510, 7520, and 7530) provide for cassette-based, diskette-based, or multi-media operation on progressively enhanced levels of sophistication. Each model's configuration starts with a CRT display, a keyboard, a controller, and a cassette or diskette drive; additional peripherals can be added as needed. The 7500 Series peripherals include a single or dual magnetic tape cassette drive, single or dual diskette drive, and either an 800 or 1600 bpi ½" magnetic tape drive, all of which are industry-compatible, and a 50-, 70-, or 125-lpm printer.

Each system's "personality" (data entry, communications, media conversion, or program processing) is molded by loading preprogrammed logic modules from diskette or cassette into the system's RAM memory; its "personality" can be changed simply by loading a new module. Since the RAM memory is volatile, control logic must be reloaded upon each power-up. ▷

A family of single-workstation intelligent terminals that support key-to-cassette or key-to-diskette data entry, media conversion, and bisynchronous batch mode data communications.

User programs are implemented via NCR's BASIC +6 interpreter, which provides an enhanced version of BASIC.

System components include a control unit, a 9- or 12-inch CRT display, a keyboard, and either a magnetic tape cassette drive or a diskette drive. Optional peripherals include a 50-, 70-, or 125-lpm printer, an OCR-A font option, and a ½-inch magnetic tape drive.

A sample configuration, including controller, 12-inch CRT, keyboard, dual diskette drive, BSC adapter, BASIC +6 software, and 50-lpm printer, can be purchased for $11,145, or rented for $556 per month on a five-year rental including maintenance.

CHARACTERISTICS

VENDOR: NCR Corporation, 1700 S. Patterson Blvd., Dayton, Ohio 45479. Telephone (513) 449-2000.

DATE OF ANNOUNCEMENT: June 1978.

DATE OF FIRST DELIVERY: Model 7510—July 1978; Model 7530—October 1978; Model 7520—August 1979.

NUMBER DELIVERED TO DATE: 300.

SERVICED BY: NCR.

CONFIGURATION

The NCR 7500 Series is a family of multi-purpose systems that can be configured as remote batch terminal workstations, user-programmable terminals, or stand-alone small business computers. The family's design concept is modular, and hardware and control logic components can be mixed-and-matched to fulfill each user's requirements. As the user's needs change, the system can be expanded in the field, within the limits of the selected configuration.

The 7500 Series is available in three model configurations, each providing a progressively more sophisticated level of operation. The basic components in each configuration include a microprocessor-based system controller containing 48K bytes of RAM memory, an integral 9-inch CRT display with a screen capacity of 512 characters, a detached keyboard selected from one of three styles, and a cassette or diskette module. An optional 12-inch, 2000-character CRT display is available for any 7500 configuration.

In addition, each configuration supports a unique set of hardware and control logic modules that determines its range of capabilities: ▶

NCR 7500 Series Systems

▷ A non-expandable 48K-byte RAM memory is provided on each 7500 Series system. Of the 48K bytes, 20K bytes are available for processing of user programs, 24K bytes are occupied by the preprogrammed logic modules, and 4K bytes are dedicated to system requirements. User programs are developed and processed using an NCR version of BASIC, which NCR has dubbed BASIC +6. Like the other logic modules, the BASIC +6 interpreter is loaded into the system from cassette or diskette. Unlike the other logic modules, which can be copied on to a user-supplied cassette or diskette for no charge at NCR field offices and are supported by the 7500 Series field engineering group, the BASIC +6 module is separately priced and distributed and supported through NCR's corporate field support group.

The data entry module provides a menu-driven para-meterized language designed for basic formatted data entry. A simple worksheet is provided for preparation of each format. In addition to basic data entry logic, the module contains a number of features similar to those provided on sophisticated key-to-disk systems, such as operator prompting, enhanced file searching, totals accumulation, data processing operations (arithmetics, moves, clears, etc.), check digit generation/ verification, direct addressing of a specific level of a multi-level format program, and constants storage/ insertion. However, so that users who do not need an enhanced level of operation do not end up paying for it, NCR individually "locks out" each of these features unless the user selects the extra cost "key" to enable that particular feature.

The media conversion module permits conversion from one media to another one record or one file at a time. With the Match On option, it can also provide selective copying of records from one peripheral to another under control of a user-designed mask, which can filter out any non-essential data. By copying only that data which is to be read, transmitted, or received, savings in communications charges, computer time, and peripheral device utilization may be significant. The module provides operator prompts by which the user can specify record length, block size, and data code separately for the input and the output media; the conversion program handles changes in record length, blocking/unblocking, and code translation automatically. Basic cassette-based or diskette-based conversion logic is provided for the two smaller models. An enhanced version is provided for the multi-media configuration, and permits conversion from/to virtually any of the system's components.

The bisynchronous communications module provides batch mode IBM 2780/3780 emulation for communications with all NCR and non-NCR systems that support 2780/3780 protocol. Included in its logic is the ability to dump transmitted/received data to the printer.

NCR has introduced two specialized system packages for the 7520 system: the Small Business System package, and the Receiving and Marking System package. The SBS package includes a 12-inch CRT, keyboard, dual diskette ▷

▶ **Model 7510**—provides support for a single ANSI/ECMA magnetic tape cassette drive, which can optionally be expanded to a dual drive. Control logic modules support key-to-cassette data entry, cassette-to-cassette or cassette-to-printer media conversion, cassette-oriented data processing, 2780/3780 bisynchronous communications, and ACH print files.

Model 7520—provides support for a single industry-standard diskette drive, which can optionally be expanded to a dual drive. A ½-inch magnetic tape drive can also be added to the 7520. Control logic modules include enhanced key-to-diskette data entry that permits sequential or direct access filing; diskette-to-diskette, diskette-to-tape, or diskette-to-printer media conversion; diskette-oriented data processing, and 2780/3780 bisynchronous communications.

Model 7530—provides support for a single ANSI/ECMA magnetic tape cassette drive, which can optionally be expanded to a dual drive. Both a ½-inch magnetic tape drive and a single or dual diskette drive can be added to the 7530. Control logic modules include key-to-cassette and key-to-diskette data entry; enhanced media conversion capabilities from/to all appropriate hardware components; cassette- or diskette-oriented data processing; 2780/3780 bisynchronous communications; and ACH communication to magnetic tape.

One of three line printer models can be added to any 7500 configuration. The line printers range in speed from 50 to 125 lpm; two models provide either non-stylized or OCR-A printing. An OCR-A Font, Tag, and Label strip printer is available on the 7520 system.

User-programming is supported on two levels. A para-meterized data entry language is provided for data recording and verification. General purpose user-written programs can be developed and run locally via NCR's BASIC +6 interpreter.

A bisynchronous communications adapter with supporting control logic module is available on all models and permits the 7500 to communicate with an NCR or non-NCR mainframe as a remote batch entry workstation in IBM 2780/3780 mode. Point-to-point communications are also supported with another 7500 Series system in batch mode. The bisynchronous communications module also allows off-line printer from cassette, diskette, or ½-inch magnetic tape to the printer. Federal Reserve Automatic Clearing House (ACH) communication is also supported on the 7530 Magnetic Tape Systems.

TRANSMISSION SPECIFICATIONS

Point-to-point or multipoint operation is supported for communications with an NCR or non-NCR host computer. Point-to-point 7500 Series to 7500 Series communications is also supported. Data is transmitted synchronously in half-duplex mode in blocks of up to 512 characters. Transmission speed is user-selectable at rates of 2400 or 4800 bps; 9600 bps transmission (local only) is also supported for communication from diskette or magnetic tape media. Either ASCII or EBCDIC code may be transmitted. Translation of data stored in EBCDIC into ASCII transmission code, and vice versa, can be performed "on the fly." The bisynchronous communications adapter option includes an RS-232-C interface.

Bisynchronous communications control logic modules can be configured for use by a 7500 communicating with other NCR systems to feature NCR's Century-based bisynchronous protocol, which contains many, but not all, features of IBM 2780/3780 message formatting, or to provide IBM 2780/3780 emulation compatible with other vendor's systems. ▶

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drive, and either a 50-, 70-, or 125-lpm printer. Users have access to a library of optional preprogrammed application packages, including payroll, general ledger, accounts receivable, accounts payable, and fixed asset accounting. The Receiving and Marking package is aimed at the retail industry, and can be used in conjunction with the NCR 6448 OCR Tag and Label Printer.

The 7500 Series is upward-compatible with, and effectively replaces its predecessor, NCR's 7200 Series.

USER REACTION

In November 1981 Datapro contacted five users of the NCR 7500 Series, who reported on their experience with 8 systems. These systems had been installed for an average of over one year. All of those contacted had acquired their NCR 7500s from the manufacturer; four of the users had purchased them, and one leased the equipment. All maintenance was being performed by NCR.

The firms contacted included three banks, a loan company, and a manufacturing concern. Applications these users found for their NCR systems included accounting, transactional bank processing, transmission of information, conversion of information from cassettes to diskettes (for use on IBM equipment), and ticket making.

These users' ratings are tabulated below:

	Excellent	Good	Fair	Poor	WA*
Overall performance	2	3	0	0	3.4
Ease of operation	2	3	0	0	3.4
Ease of programming	0	1	1	0	**
Manufacturer's software	2	1	0	0	3.7
Hardware reliability	4	1	0	0	3.8
Maintenance service	4	1	0	0	3.8

*Weighted Average based on a scale of 4.0 for Excellent.
**Weighted Average regarded as invalid for fewer than three responses.

Two of the users could not rate the ease of programming; this function was performed by NCR and a third party. One user did not rate the manufacturer's software since he had acquired his software from an outside software firm (and wasn't satisfied). Another user declined to rate either the programming or software.

These users appear very satisfied with their NCR 7500 Series systems. Reliability, simplicity of use, and fast operation ("It does the work of two people") were cited as product strengths. One user simply stated, "You plug them in, and they do their thing 24 hours a day."

When asked to describe product weaknesses, one user felt the third party software he was using was very poor (the software company had been recommended by NCR). Another noted the absence of a high-level programming language, which resulted in often-tedious program writing. One user commented on the fact that the NCR ▷

The 7530 Automated Clearing House (ACH) Communication System provides bisynchronous communications, over lease or dial-up lines, at speeds of 2400 or 4800 bps.

SOFTWARE SUPPORT

Each 7500 Series system is equipped with an Intel 8080 microprocessor that provides basic operating logic. Firmware control logic modules (available from NCR at no extra charge) are loaded from cassette (Models 7510 and 7530) or diskette (Model 7520 and 7530) to implement data entry, media conversion, and data communications. An enhanced BASIC interpreter is provided for general purpose user-programming.

The data entry module supports menu-driven multi-level data recording and verification via cassette (Models 7510 and 7530) and diskette (Model 7520 and 7530). Standard module functions include data entry/verification, format entry/verification, cassette/diskette reading/writing, copying to the printer, sequential access filing, direct access filing (diskette-based data entry only), writing/deleting file marks, specifying record length (up to 256 characters), record deletion, etc. The module provides a parameterized language for creation of fill-in-the-blanks formats.

Format characteristics are specified using a simplified worksheet. Standard parameters permit the user to designate each field's length (up to 255 characters), characteristics (zero-fill/space-fill, alpha/numeric, right/left justify, etc.), and entry/verification requirements (must/may fill, bypass, skip, duplicate, etc.), and to specific multi-record block length (up to 512-character blocks). Multiple formats may be stored on a single cassette/diskette.

Separately-priced optional functions can be added to the basic data entry support provided by NCR. These include Operator-Lead-Through (OLT), which provides user-written prompts of up to 18 characters in length to aid the operator in entering data; Search-On, which permits the file to be searched for a specified record or format number, end-of-file or end-of-data mark, or mask; Accumulator Controls, which provide 2, 4, 8, or 12 accumulators for totalling; Operations Controls, which permit 1, 2, 4, or 7 different operations, such as add, subtract, batch transfer, move, perform check digit generation or verification, or clear total, to be performed on data in a specified field or accumulator; Check Digit, which allows up to three different check digit formulas to be specified per program; Direct Level Addressing, which permits the operator to access a particular level in a multi-level format program; Constants Table, from which user-specified constants can be selected for insertion into a data field or accumulator; and Multiply/Divide, which permits quantity and amount extensions during data entry.

A user memory of 512 bytes is provided for format program processing. Optionally the format program memory can be expanded to 1024 or 2048 bytes.

The media conversion module permits conversion from one media to another one record or one file at a time. With the Match-On option, it can also provide selective copy of records under control of a user-designed mask. An operator sign-on procedure permits the user to specify record length, block size, and data code separately for the input and output media; the conversion program handles changes in record length, block/unblocking, and code translation automatically. Media conversion support for Model 7510 permits cassette-to-printer or cassette-to-cassette transfer. Model 7520 supports diskette-to-printer, diskette-to-tape, or diskette-to-diskette conversion. Model 7530 provides enhanced media conversion functions that essentially permits conversion from any one magnetic media (cassette, ▶

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▷ maintenance personnel were not "well rounded," since each of the service persons were skilled in the repair of particular system components, but had no technical knowledge of the rest of the system. Another user complained that the ribbons for his printer were originally promised by NCR to be two-pass, but were in fact only good for a single pass, doubling his ribbon expenditures.□

▶ magnetic tape, or diskette) or from the screen, to any other magnetic media or the printer.

In addition to providing the data communications support described in Transmission Specifications above, the bisynchronous communications enables "dumping" of data from the cassette, diskette drive, or magnetic tape to the printer.

NCR provides an enhanced version of the BASIC programming language, which it calls its BASIC +6 interpreter, for user programming and local processing. The interpreter occupies 24K bytes of user memory; an additional 20K bytes are available for user programs. The interpreter is available in two versions: cassette-oriented (for use with Models 7510 and 7530) and diskette-oriented (for use with Models 7520 and 7530). Programs written in BASIC +6 can perform a full range of data processing operations, including transaction recording, arithmetic and logical manipulation, file management, sorting, and report printing. In order for BASIC +6 software to be implemented, two hardware options are required: the BASIC +6 Enable Kit on the controller; and either the BASIC +6 keyboard or the typewriter-style keyboard with the BASIC +6 conversion kit.

A full complement of preprogrammed diskette-stored business applications programs is available from Data Train, Inc. (Grants Pass, OR) for use with Model 7520 Small Business System. Programs are currently available for fixed asset accounting, accounts receivable, accounts payable, payroll, and general ledger applications.

When the 2000-character CRT display is used with BASIC +6 programs, the entire screen can be utilized. However the data entry, media conversion, and bisynchronous communications firmware only utilize a 32-character wide by 16 line deep area of the upper left portion of the 12-inch screen for data display; in addition the upper right corner can be used to display the menu.

COMPONENTS

DISPLAY: Two CRT displays are available with the 7500 Series: a 9-inch (diagonal measurement) monitor with a screen capacity of 512 characters, arranged in 16 lines of 32 characters; and a 12-inch monitor with a screen capacity of 2000 characters arranged in 25 lines of 80 characters. A 64-character ASCII displayable character set including upper case alphabetics is standard on the 9-inch CRT; a 128-character set with upper and lower case alphabetics and displayable control codes is optional on the 9-inch CRT and standard on the 12-inch CRT. Characters are formed by a 5-by-7 dot matrix. Field-addressable display attributes include high/low intensity and (12-inch screen only) reverse video.

KEYBOARD: Three detachable keyboards are offered for use with the 7500 Series: a keypunch-style keyboard with an 11-key numeric pad, a typewriter-style keyboard with an 11-key numeric pad, and a BASIC +6 keyboard with 11-key numeric pad. The BASIC +6 keyboard is required for NCR's BASIC +6 software; keypunch and typewriter keyboards are used with the NCR firmware modules.

However, NCR provides kits that permit field-installed conversion of the typewriter-style keyboard to the BASIC +6 keyboard and vice versa. Each keyboard generates the full 128-character ASCII set.

MAGNETIC TAPE CASSETTE DRIVE: A single or dual freestanding drive that supports ANSI/ECMA compatible cassettes. Data is recorded in ASCII code. Maximum block size is 512 characters. Read/record speed is 75 or 15 ips. Single-side capacity is 272,384 characters when using a 1.2-inch inter-record gap, 512-character block, and a 282-foot tape. Cassettes produced by the 7500 Series are compatible with NCR mainframes via a common trunk peripheral, the NCR 7649 General Purpose Peripheral Controller, or via the Century 8350 cassette reader. The standard method of cassette input (i.e., NCR 636) may be continued as a cassette device.

DISKETTE DRIVE: A single or dual freestanding drive that supports industry-standard formatting and initialization via single-side/single-density 8-inch diameter diskettes. Data is recorded in ASCII or EBCDIC code. Each diskette can hold 243K bytes, resulting in a total dual drive capacity of 486K bytes. Diskettes are compatible with NCR computers via a common trunk peripheral, the NCR 7649 General Purpose Peripheral Controller. If the host mainframe is an N-8400, or an I-8400 with the "N" option installed, diskettes may be read directly into the system via the integrated firmware loader.

MAGNETIC TAPE (½-INCH): Two 9-track industry-compatible magnetic tape drives are available, an 800 bpi NRZ drive and a 1600 bpi PE drive. Either drive can utilize ASCII or EBCDIC code, which is selectable by the operator. Maximum block size is 2048 characters. Maximum drive capacity is 4,198,400 characters (800 bpi drive) or 6,871,040 characters (1600 bpi drive), when using a .6-inch inter-record gap, 2048-character block, and 540-foot tape. Connection to a 7500 System requires two optional interfaces, one on the 7500 and one on the tape drive.

MATRIX PRINTER: Three line printers, Models 6440-0202, -0302, and -0402, which print at rates of 125, 70, and 50 lines per minute respectively, are offered for use with the 7500 Series. Printing width is 132 columns. The standard character set contains 64 characters (no lower case alphabetics), which are printed using a 7-by-7 dot matrix. Optionally, Models -0202 and -0302 offer a 96-character set (including lower case alphabetics) that utilizes a 9-by-7 dot matrix; this option requires the Upper/Lower Case feature on the 7500 controller. Models -0202 and -0302 also offer a 64-character OCR-A character generator, which prints OCR characters using a 9-by-9 dot matrix. OCR printing reduces the rated speed of the Model -0202 to 75 lpm, and of the Model -0302 to 40 lpm. Models -0202 and -0302 also offer an optional audible alarm. Model -0302 provides an optional compressed pitch feature that permits the operator to select 6 lpi or 8 lpi vertical spacing. Models -0302 and -0402 provide an optional tear bar kit. Connection to a 7500 system requires two optional interfaces, one on the 7500 and one on the printer.

OCR-A TAG & LABEL PRINTER: The Model 6448 OCR-A Printer prints merchandise labels and tags under the communications control of a parent unit. Any controlling unit that communicates through a standard EIA RS-232-C or CCITT V24 interface can input data to the printer. The 6448 prints up to 32 OCR-A/B characters per line on 4-line ticket media. Two models are available. One model permits asynchronous point-to-point communications and allows one printer per control unit. The second model permits asynchronous multi-point communications and allows for up to eight printers per control unit. A 6-line version of the 6448, for point-to-point or pollable environments, has been added. ▶

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▶ This unit prints 4 lines of OCR-A and 2 lines of non-OCR-A print. Transmission rates for the 6448 range from 110 to 9600 bps. Average print speed is 150 tickets per minute (10 characters per line). Single or multiple-part tickets are accommodated.

PRICING

NCR 7500 Series components are available for purchase or can be rented on a one-, three-, or five-year rental plan.

Volume discounts are available; contact NCR for details. Monthly maintenance is included in rental plans; a separate maintenance contract is available for purchased units. Control logic modules for data entry, communications, and media conversion are available at no extra charge from NCR field offices for copying onto a user-supplied cassette or diskette. The BASIC +6 interpreters and applications program packages are separately priced.

			Monthly Charge*			
		1-Year Rental	3-Year Rental	5-Year Rental	Purchase	Annual Maint.
7510	System Control Unit; includes 48K-byte RAM, CRT display, cassette recorder interface, and firmware modules for data entry, media conversion, and bisynchronous data communications; requires 7620 cassette recorder and 5850 keyboard					
	Model 3107; 9-inch display	$157	$150	$137	$3,985	$ 563
	Model 3607; 12-inch display	202	193	176	4,995	470
7520	System Control Unit; includes 48K-byte RAM, CRT display, and firmware modules for data entry, media conversion, and bisynchronous data communications; requires 7642 diskette drive with interface and 5850 keyboard					
	Model 0207; 9-inch display	149	143	130	3,845	302
	Model 2707; 12-inch display	172	164	147	4,575	378
	Small Business System Package; 50 lpm printer	410	390	345	5,370	1,017
	Small Business System Package; 70 lpm printer	439	418	375	7,415	1,231
	Small Business System Package; 125 lpm printer	477	455	407	9,265	1,297
	Receiving & Marking System Package	268	258	237	7,085	538
7530	System Control Unit; includes 48K-byte RAM, CRT display, cassette recorder interface, and firmware modules for data entry, media conversion, and bisynchronous data communications; requires 7620 cassette recorder and 5850 keyboard					
	Model 3307; 9-inch display	187	178	160	4,475	336
	Model 3907; 12-inch display	221	210	189	5,225	473

Options

		1-Year Rental	3-Year Rental	5-Year Rental	Purchase	Annual Maint.
	128 ASCII Character Set; for 9-inch displays only	7	6	5	130	13
	Bisynchronous Communications Adapter	41	39	35	1,150	160
	Operator Lead Through	6	5	4	105	13
	Search-On	6	5	4	105	13
	2 Accumulator Controls plus 1 Operations Control	31	30	26	740	53
	4 Accumulator Controls plus 2 Operations Controls	45	43	39	1,060	87
	8 Accumulator Controls plus 4 Operations Controls	54	52	46	1,260	107
	12 Accumulator Controls plus 7 Operations Controls	58	55	50	1,360	120
	3 Check Digit Generation/Verification Schemes	18	16	14	425	27
	Direct Level Addressing	10	9	8	210	20
	Constants Table (includes Search-On)	18	16	14	425	40
	Match On	6	5	4	105	13
	Multiply/Divide	13	12	11	210	13
	BASIC +6 Enable Kit; required for implementation of BASIC +6 software	—	—	—	10	—
	Upper/Lower Case; required for implementation of the 96-character set on an attached 6440 printer	—	—	—	10	—
	Format Memory Expansion; increases format memory from 512 bytes (standard) to 1024 bytes	8	7	6	160	20
	Format Memory Expansion; increase format memory from 512 bytes (standard) to 2048 bytes	18	16	14	425	47

Peripherals

		1-Year Rental	3-Year Rental	5-Year Rental	Purchase	Annual Maint.
5850	**Keyboards**					
	Keypunch-style with 11-key numeric pad	16	15	14	475	62
	Typewriter-style with 11-key numeric pad	16	15	14	475	62
	BASIC +6 keyboard with 11-key numeric pad	16	15	14	475	62
	Conversion Kit; permits conversion of typewriter-style keyboard to BASIC +6 keyboard	—	—	—	70	—

▶

*Includes maintenance.

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		Monthly Charge*				
		1-Year Rental	3-Year Rental	5-Year Rental	Purchase	Annual Maint.
➤	Conversion Kit; permits conversion of BASIC +6 keyboard to typewriter-style keyboard	—	—	—	$ 70	—
7620	Magnetic Cassette Tape Drives; 15 ips; 7510 & 7530 only					
	Single Drive	$ 42	$ 38	$ 36	1,340	$ 158
	Dual Drive	84	76	72	2,385	340
7642	Diskette Drive; includes interface; 7520 & 7530 only					
	Single Drive	119	113	101	2,490	356
	Dual Drive	143	136	121	3,350	420
7330	Half-inch Magnetic Tape Drives; 7520 & 7530 only					
	800 bpi NRZ Tape Drive	251	240	216	8,000	646
	1600 bpi PE Tape Drive	393	374	336	12,000	844
	Tape Drive Interface	6	5	4	125	12
	7500/7330 Interface	19	18	16	500	70
6440	Line printer; 64-character set using 7-by-7 dot matrix					
	Model 0202; 125 lpm	244	233	209	6,800	799
	Model 0302; 70 lpm	205	196	175	4,790	733
	Model 0402; 50 lpm	175	166	150	4,115	519
	7500 Interface; requires Printer Interface	20	19	17	500	53
	Printer Interface; includes cable	20	19	17	500	53
	96-Character Set using 9-by-7 Dot Matrix; in lieu of standard character set & matrix; Models 0202 and 0302 only; requires Upper/Lower Case feature on Control Unit	4	4	4	105	—
	64-Character OCR-A Font set and character generator; in lieu of standard character set & matrix; Models 0202 and 0302 only; requires 9-by-9 Overlapping Dot feature	6	6	6	160	—
	9-by-9 Overlapping Dots; Model 0202 only	80	76	68	2,000	180
	9-by-9 Overlapping Dots; Model 0302 only	48	46	41	1,200	108
	Audible Alarm; Models 0202 and 0302 only; also includes 6/8 lpi Compressed Pitch feature for Model 0302 only	5	5	5	115	—
	Tear Bar Kit; 8½-inch; Models 0302 and 0402 only	9	9	9	90	—
6448	OCR-A Font Tag & Label Printer					
	6-line Point-to-Point	355	—	—	8,200	984
	6-line Pollable	377	—	—	8,700	1,044
	4-line Point-to-Point	322	—	—	7,700	780
	4-line Pollable	342	—	—	8,200	840
	Cutter Stacker/Power Take-Up	68	—	—	1,650	150

		Monthly License*	One-Time License	Annual Maint.
Software				
	BASIC +6 Interpreter—			
	Cassette-based; for 7510/7530	$35	$800	T/M
	Diskette-based; for 7520/7530	35	800	T/M

*Includes maintenance.■

NCR 7500 Series Systems

MANAGEMENT SUMMARY

NCR's 7500 Series is a family of modular terminal systems with a mix-and-match assortment of hardware and control logic modules that permits the user to select the precise combination of components needed now, and to add additional elements later. Any 7500 Series system can operate on-line as an intelligent batch terminal and off-line as a data entry workstation or desktop computer, depending on the hardware/logic configuration selected. Control logic is provided for four types of applications: cassette- or diskette-based data entry, media conversion, bisynchronous batch data communications, and local user program development and processing.

Three models provide for cassette-based, diskette-based, or multi-media operation on progressively enhanced levels of sophistication. Each model's configuration starts with a CRT display, a keyboard, a controller, and a cassette or diskette drive; additional peripherals can be added as needed. The 7500 Series peripherals include a single or dual magnetic tape cassette drive, single or dual diskette drive, and either an 800 or 1600 bpi ½" magnetic tape drive, all of which are industry-compatible, and a 50-, 70-, or 125-lpm printer.

Each system's "personality" (data entry, communications, media conversion, or program processing) is molded by loading preprogrammed logic modules from diskette or cassette into the system's RAM memory; its "personality" can be changed simply by loading a new module. Since the RAM memory is volatile, control logic must be reloaded upon each power-up. $\triangleright$

A family of single-workstation intelligent terminals that support key-to-cassette or key-to-diskette data entry, media conversion, and bisynchronous batch mode data communications.

User programs are implemented via NCR's BASIC +6 interpreter, which provides an enhanced version of BASIC.

System components include a control unit, a 9- or 12-inch CRT display, a keyboard, and either a magnetic tape cassette drive or a diskette drive. Optional peripherals include a 50-, 70-, or 125-lpm printer, an OCR-A font option, and a ½-inch magnetic tape drive.

A minimum configuration, including controller, 9-inch CRT, keyboard, single diskette drive, BSC adapter, and 50-lpm printer, can be purchased for $12,595, or rented for $464 per month on a three-year rental including maintenance.

CHARACTERISTICS

NCR's 7530, the most sophisticated member of the 7500 Series, can support a wide variety of peripherals, including a 50- to 125-lpm matrix printer (foreground); a ½-inch magnetic tape drive, dual diskette drive, and bisynchronous communications adapter (left of operator); and a magnetic tape cassette drive (right of operator).

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A non-expandable 48K-byte RAM memory is provided on each 7500 Series system. Of the 48K bytes, 20K bytes are available for processing of user programs, 24K bytes are occupied by the preprogrammed logic modules, and 4K bytes are dedicated to system requirements. User programs are developed and processed using an NCR version of BASIC, which NCR has dubbed BASIC +6. Like the other logic modules, the BASIC +6 interpreter is loaded into the system from cassette or diskette. Unlike the other logic modules, which can be copied on to a user-supplied cassette or diskette for no charge at NCR field offices and are supported by the 7500 Series field engineering group, the BASIC +6 module is separately priced and distributed and supported through NCR's corporate field support group.

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The bisynchronous communications module provides batch mode IBM 2780/3780 emulation for communications with NCR Century/Criterion and non-NCR systems. Included in its logic is the ability to dump transmitted/received data to the printer.

The 7500 Series is upward-compatible with, and effectively replaces its predecessor, NCR's 7200 Series.□

▶ **NUMBER DELIVERED TO DATE: 300.**

SERVICED BY: NCR.

CONFIGURATION

The NCR 7500 Series is a family of multi-purpose systems that can be configured as remote batch terminal work-stations, user-programmable terminals, or stand-alone small business computers. The family's design concept is modular, and hardware and control logic components can be mixed-and-matched to fulfill each user's requirements. As the user's needs change, the system can be expanded in the field, within the limits of the selected configuration.

The 7500 Series is available in three model configurations, each providing a progressively more sophisticated level of operation. The basic components in each configuration include a microprocessor-based system controller containing 48K bytes of RAM memory, an integral 9-inch CRT display with a screen capacity of 512 characters, a detached keyboard selected from one of three styles, and a cassette or diskette module. In any configuration, the CRT display can be upgraded to a 12-inch, 2000-character model.

In addition, each configuration supports a unique set of hardware and control logic modules that determines its range of capabilities:

Model 7510—provides support for a single magnetic tape cassette drive, which can optionally be expanded to a dual drive. Control logic modules support key-to-cassette data entry, cassette-to-cassette or cassette-to-printer media conversion, and cassette-oriented data processing.

Model 7520—provides support for a single diskette drive, which can optionally be expanded to a dual drive. A ½-inch magnetic tape drive can also be added to the 7520. Control logic modules include enhanced key-to-diskette data entry that permits sequential or direct access filing; diskette-to-diskette, diskette-to-tape, or diskette-to-printer media conversion; and diskette-oriented data processing.

Model 7530—provides support for a single magnetic tape cassette drive, which can optionally be expanded to a dual drive. Both a ½-inch magnetic tape drive and a single or dual diskette drive can be added to the 7530. Control logic modules include key-to-cassette and key-to-diskette data entry; enhanced media conversion capabilities from/to all appropriate hardware components; and cassette- or diskette-oriented data processing.

One of three line printer models can be added to any 7500 configuration. The line printers range in speed from 50 to 125 lpm; two models provide either non-stylized or OCR-A printing.

User-programming is supported on two levels. A para-meterized data entry language is provided for data recording and verification. General purpose user-written programs can be developed and run locally via NCR's BASIC +6 interpreter.

A bisynchronous communications adapter with supporting control logic module is available on all models and permits the 7500 to communicate with an NCR Century or Criterion or non-NCR mainframe as a remote batch entry worksta-tion in IBM 2780/3780 mode. Point-to-point communica-tions are also supported with another 7500 Series system in batch mode. The bisynchronous communications module also allows off-line printing from cassette, diskette, or ½-inch magnetic tape to the printer.

TRANSMISSION SPECIFICATIONS

Point-to-point or multipoint operation is supported for communications with an NCR Century or Criterion or a non-NCR host computer. Point-to-point 7500 Series to 7500 Series communications is also supported. Data is transmitted synchronously in half-duplex mode in blocks ▶

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▶ of up to 512 characters. Transmission speed is user-selectable at rates of 2400 or 4800 bps; 9600 bps transmission (local only) is also supported for communication from diskette or magnetic tape media. Either ASCII or EBCDIC code may be transmitted. Translation of data stored in EBCDIC into ASCII transmission code, and vice versa, can be performed "on the fly". The bisynchronous communications adapter option includes an RS-232C interface.

Bisynchronous communications control logic modules can be configured for use by a 7500 communicating with other NCR systems to feature NCR's Century-based bisynchronous protocol, which contains many, but not all, features of IBM 2780/3780 message formatting, or to provide IBM 2780/3780 emulation compatible with other vendor's systems.

SOFTWARE SUPPORT

Each 7500 Series system is equipped with an Intel 8080 microprocessor that provides basic operating logic. Control logic modules (available from NCR at no extra charge) are loaded from cassette (Models 7510 and 7530) or diskette (Model 7520 and 7530) to implement data entry, media conversion, and data communications. An enhanced BASIC interpreter is provided for general purpose user-programming. A number of ready-to-use diskette-stored business applications software packages are available from NCR for use with the two diskette-supporting configurations, Models 7520 and 7530.

The data entry module supports menu-driven multi-level data recording and verification via cassette (Models 7510 and 7530) and diskette (Model 7520 and 7530). Standard module functions include data entry/verification, format entry/verification, cassette/diskette reading/writing, copying to the printer, sequential access filing, direct access filing (diskette-based data entry only), writing/deleting file marks, specifying record length (up to 256 characters), record deletion, etc. The module provides a parameterized language for creation of fill-in-the-blanks formats.

Format characteristics are specified using a simplified worksheet. Standard parameters permit the user to designate each field's length (up to 255 characters), characteristics (zero-fill/space-fill, alpha/numeric, right/left justify, etc.), and entry/verification requirements (must/may fill, bypass, skip, duplicate, etc.), and to specific multi-record block length (up to 512-character blocks). Multiple formats may be stored on a single cassette/diskette.

Separately-priced optional functions can be added to the basic data entry support provided by NCR. These include Operator-Lead-Through (OLT), which provides user-written prompts of up to 18 characters in length to aid the operator in entering data; Search-On, which permits the file to be searched for a specified record or format number, end-of-file or end-of-data mark, or mask; Accumulator Controls, which provide 2, 4, 8, or 12 accumulators for totalling; Operations Controls, which permit 1, 2, 4, or 7 different operations, such as add, subtract, batch transfer, move, perform check digit generation or verification, or clear total, to be performed on data in a specified field or accumulator; Check Digit, which allows up to three different check digit formulas to be specified per program; Direct Level Addressing, which permits the operator to access a particular level in a multi-level format program; Constants Table, from which user-specified constants can be selected for insertion into a data field or accumulator; and Multiply/Divide, which permits quantity and amount extensions during data entry.

A user memory of 512 bytes is provided for format program processing. Optionally the format program memory can be expanded to 1024 or 2048 bytes.

The media conversion module permits conversion from one media to another one record or one file at a time. With the Match-On option, it can also provide selective copy of records under control of a user-designed mask. An operator sign-on procedure permits the user to specify record length, block size, and data code separately for the input and output media; the conversion program handles changes in record length, block/unblocking, and code translation automatically. Media conversion support for Model 7510 permits cassette-to-printer or cassette-to-cassette transfer. Model 7520 supports diskette-to-printer, diskette-to-tape, or diskette-to-diskette conversion. Model 7530 provides enhanced media conversion functions that essentially permits conversion from any one magnetic media (cassette, magnetic tape, or diskette) or from the screen, to any other magnetic media or the printer.

In addition to providing the data communications support described in Transmission Specifications above, the bisynchronous communications enables "dumping" of data from the cassette or diskette drive to the printer.

NCR provides an enhanced version of the BASIC programming language, which it calls its BASIC +6 interpreter, for user programming and local processing. The interpreter occupies 24K bytes of user memory; an additional 20K bytes are available for user programs. The interpreter is available in two versions: cassette-oriented (for use with Models 7510 and 7530) and diskette-oriented (for use with Models 7520 and 7530). Programs written in BASIC +6 can perform a full range of data processing operations, including transaction recording, arithmetic and logical manipulation, file management, sorting, and report printing. In order for BASIC +6 software to be implemented, two hardware options are required: the BASIC +6 Enable Kit on the controller; and either the BASIC +6 keyboard or the typewriter-style keyboard with the BASIC +6 conversion kit.

A full complement of preprogrammed diskette-stored business applications programs are available from NCR for use with Model 7520 and 7530 systems that have implemented the BASIC +6 interpreter. Programs are currently available for fixed asset accounting, accounts receivable, accounts payable, payroll, and general ledger applications. Hardware configuration for these programs requires the 12-inch CRT, dual diskette drive, BASIC +6 keyboard, and matrix printer.

When the 2000-character CRT display is used with BASIC +6 programs, the entire screen can be utilized. However the data entry, media conversion, and bisynchronous communications firmware only utilize a 32-character wide by 16 line deep area of the upper left portion of the 12-inch screen for data display; in addition the upper right corner can be used to display the menu.

COMPONENTS

DISPLAY: Two CRT displays are available with the 7500 Series: a 9-inch (diagonal measurement) monitor with a screen capacity of 512 characters, arranged in 16 lines of 32 characters; and a 12-inch monitor with a screen capacity of 2000 characters arranged in 25 lines of 80 characters. A 64-character ASCII displayable character set including upper case alphabetics is standard on the 9-inch CRT; a 128-character set with upper and lower case alphabetics and displayable control codes is optional on the 9-inch CRT and standard on the 12-inch CRT. Characters are formed by a 5-by-7 dot matrix. Field-addressable display attributes include high/low intensity and (12-inch screen only) reverse video. ▶

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► KEYBOARD: Three detachable keyboards are offered for use with the 7500 Series: a keypunch-style keyboard with an 11-key numeric pad, a typewriter-style keyboard with an 11-key numeric pad, and a BASIC +6 keyboard with 11-key numeric pad. The BASIC +6 keyboard is required for NCR's BASIC +6 software; keypunch and typewriter keyboards are used with the NCR firmware modules. However, NCR provides kits that permit field-installed conversion of the typewriter-style keyboard to the BASIC +6 keyboard and vice versa. Each keyboard generates the full 128-character ASCII set.

MAGNETIC TAPE CASSETTE DRIVE: A single or dual freestanding drive that supports ANSI/ECMA compatible cassettes. Data is recorded in EBCDIC code. Maximum block size is 512 characters. Read/record speed is 15 ips. Single-side capacity is 272,384 characters when using a 1.2-inch inter-record gap, 512-character block, and a 282-foot tape. Cassettes produced by the 7500 Series are compatible with Century and Criterion mainframes via a common trunk peripheral, the NCR 7649 General Purpose Peripheral Controller, or via the Century 8350 cassette reader. The standard method of cassette input (i.e. NCR 636) may be continued as a cassette device.

DISKETTE DRIVE: A single or dual freestanding drive that supports industry-standard formatting and initialization via single-side/single-density 8-inch diameter diskettes. Data is recorded in ASCII code. Maximum block size is 512 characters. Each diskette can hold 243K bytes, resulting in a total dual drive capacity of 486K bytes. Diskettes are compatible with Century and 8400/8500 Series computers via a common trunk peripheral, the NCR 7649 General Purpose Peripheral Controller. If the host mainframe is an N-8400, or an I-8400 with the "N" option installed, diskettes may be read directly into the system via the integrated firmware loader.

MAGNETIC TAPE (½-INCH): Two 9-track industry-compatible magnetic tape drives are available, an 800 bpi NZE drive and a 1600 bpi PE drive. Either drive can utilize ASCII or EBCDIC code, which is selectable by the operator. Maximum block size is 2048 characters. Maximum drive capacity is 4,198,400 characters (800 bpi drive) or 6,871,040 characters (1600 bpi drive), when using a .6-inch inter-record gap, 2048-character block, and 540-foot tape. Connection to a 7500 System requires two optional interfaces, one on the 7500 and one on the tape drive.

MATRIX PRINTER: Three line printers, Models 6440-0202, -0302, and -0402, which print at rates of 125, 70, and 50 lines per minute respectively, are offered for use with the 7500 Series. Printing width is 132 columns. The standard character set contains 64 characters (no lower case alphabetics), which are printed using a 7-by-7 dot matrix. Optionally, Models -0202 and -0302 offer a 96-character set (including lower case alphabetics) that utilizes a 9-by-7 dot matrix; this option requires the Upper/Lower Case feature on the 7500 controller. Models -0202 and -0302 also offer a 64-character OCR-A character generator, which prints OCR characters using a 9-by-9 dot matrix. OCR printing reduces the rated speed of the Model -0202 to 75 lpm, and of the Model -0302 to 40 lpm. Models -0202 and -0302 also offer an optional audible alarm. Model -0302 provides an optional compressed pitch feature that permits the operator to select 6 lpi or 8 lpi vertical spacing. Models -0302 and -0402 provide an optional tear bar kit. Connection to a 7500 system requires two optional interfaces, one on the 7500 and one on the printer.

PRICING

NCR 7500 Series components are available for purchase or can be rented on a one-, three-, or five-year rental plan. Volume discounts are available; contact NCR for details. Monthly maintenance is included in rental plans; a separate maintenance contract is available for purchased units. Control logic modules for data entry, communications, and media conversion are available at no extra charge from NCR field offices for copying onto a user-supplied cassette or diskette. The BASIC +6 interpreters and applications program packages are separately priced.

		Monthly Charge*				
		1-Year Rental	3-Year Rental	5-Year Rental	Purchase	Annual Maint.
7510	System Control Unit; includes 48K-byte RAM, CRT display, cassette recorder interface, and firmware modules for data entry, media conversion, and bisynchronous data communications; requires 7620 cassette recorder and 5850 keyboard					
	Model 3107; 9-inch display	$147	$140	$126	$3,960	$305
	Model 3607; 12-inch display	178	169	152	4,710	395
7520	System Control Unit; includes 48K-byte RAM, CRT display, and firmware modules for data entry, media conversion, and bisynchronous data communications; requires 7642 diskette drive with interface and 5850 keyboard					
	Model 0207; 9-inch display	132	126	113	3,625	252
	Model 2707; 12-inch display	172	164	147	4,575	378
7530	System Control Unit; includes 48K-byte RAM, CRT display, cassette recorder interface, and firmware modules for data entry, media conversion, and bisynchronous data communications; requires 7620 cassette recorder and 5850 keyboard					
	Model 3307; 9-inch display	187	178	160	4,475	336
	Model 3907; 12-inch display	217	206	185	5,225	426

*Includes maintenance.

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	Monthly Charge*				
	1-Year Rental	3-Year Rental	5-Year Rental	Purchase	Annual Maint.

► Options

	1-Year Rental	3-Year Rental	5-Year Rental	Purchase	Annual Maint.
128 ASCII Character Set; for 9-inch displays only	5	5	4	125	12
Bisynchronous Communications Adapter	40	38	34	1,150	144
Operator Lead Through	4	4	3	100	12
Search-On	4	4	3	100	12
2 Accumulator Controls plus 1 Operations Control	28	27	24	700	48
4 Accumulator Controls plus 2 Operations Controls	40	38	34	1,000	78
8 Accumulator Controls plus 4 Operations Controls	48	46	41	1,200	96
12 Accumulator Controls plus 7 Operations Controls	52	49	44	1,300	108
3 Check Digit Generation/Verification Schemes	16	15	13	400	24
Direct Level Addressing	8	8	7	200	18
Constants Table (includes Search-On)	16	15	13	400	36
Match On	4	4	3	100	12
Multiply/Divide	10	10	10	200	12
BASIC +6 Enable Kit; required for implementation of BASIC +6 software	—	—	—	10	—
Upper/Lower Case; required for implementation of the 96-character set on an attached 6440 printer	—	—	—	10	—
Format Memory Expansion; increases format memory from 512 bytes (standard) to 1024 bytes	6	6	5	150	18
Format Memory Expansion; increase format memory from 512 bytes (standard) to 2048 bytes	16	15	13	400	42

Peripherals

	1-Year Rental	3-Year Rental	5-Year Rental	Purchase	Annual Maint.
5850 Keyboards					
Keypunch-style with 11-key numeric pad	15	14	13	475	52
Typewriter-style with 11-key numeric pad	15	14	13	475	52
BASIC +6 keyboard with 11-key numeric pad	15	14	13	475	52
Conversion Kit; permits conversion of typewriter-style keyboard to BASIC +6 keyboard	—	—	—	70	—
Conversion Kit; permits conversion of BASIC +6 keyboard to typewriter-style keyboard	—	—	—	70	—
7620 Magnetic Cassette Tape Drives; 15 ips; 7510 & 7530 only					
Single Drive	41	37	35	1,340	144
Dual Drive	79	71	67	2,385	280
7642 Diskette Drive; includes interface; 7520 & 7530 only					
Single Drive	106	101	90	2,350	336
Dual Drive	141	134	119	3,350	396
7330 Half-inch Magnetic Tape Drives; 7520 & 7530 only					
800 bpi NRZ Tape Drive	242	230	207	8,000	533
1600 bpi PE Tape Drive	380	361	323	12,000	696
Tape Drive Interface	6	5	4	125	12
7500/7330 Interface	18	17	16	500	58
6440 Line printer; 64-character set using 7-by-7 dot matrix					
Model 0202; 125 lpm	215	205	183	6,600	720
Model 0302; 70 lpm	180	171	153	4,650	660
Model 0402; 50 lpm	155	147	132	3,995	468
7500 Interface; requires Printer Interface	20	19	17	500	48
Printer Interface; includes cable	20	19	17	500	48
96-Character Set using 9-by-7 Dot Matrix; in lieu of standard character set & matrix; Models 0202 and 0302 only; requires Upper/Lower Case feature on Control Unit	4	4	4	105	—
64-Character OCR-A Font set and character generator; in lieu of standard character set & matrix; Models 0202 and 0302 only; requires 9-by-9 Overlapping Dot feature	6	6	6	160	—
9-by-9 Overlapping Dots; Model 0202 only	80	76	68	2,000	180
9-by-9 Overlapping Dots; Model 0302 only	48	46	41	1,200	108
Audible Alarm; Models 0202 and 0302 only; also includes 6/8 lpi Compressed Pitch feature for Model 0302 only	5	5	5	115	—
Tear Bar Kit; 8½-inch; Models 0302 and 0402 only	9	9	9	90	—

*Includes maintenance.

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	Monthly License*	One-Time License	Annual Maint.
Software			
BASIC +6 Interpreter—			
Cassette-based; for 7510/7530	$35	$800	$72
Diskette-based; for 7520/7530	42	950	84
Applications Program Packages—			
Payroll	—	750	—
General Ledger	—	850	—
Accounts Payable	—	900	—
Accounts Receivable	—	600	—
Fixed Asset Accounting	—	400	—

*Includes maintenance.■