NCR 7900 Display Terminals

The 7900 Model 1, introduced by NCR in 1979, has been ergonomically redesigned. Standard features now include a 12-inch amber display screen, tilt/swivel base, and a detachable keyboard.

MANAGEMENT SUMMARY

Introduced in 1979, NCR's 7900 Display Terminals are successors to the company's popular 796 Series. The family currently contains four ASCII terminal models, 7900 Models 1 and 3, the 7901, and the 7910, all intended largely for use with NCR's mainframes and minicomputer systems. NCR has also introduced an IBM 3270-compatible display, the 7950 (for information on this model, see Report C25-010-101).

The 7901, introduced in 1982, is the low-end member of the 7900 family. Features include a 12-inch, green phosphor display with tilt capability and a 1920-character capacity. Also standard on the 7901 is a detachable keyboard and a serial printer interface.

The 7900 Models 1 and 3 are the senior members of the family. Model 1 was introduced as a plug-compatible replacement for the 796-101; it has recently been redesigned to include a tilt/swivel monitor, amber phosphor screen, and a detachable keyboard as standard (the detachable keyboard was formerly available as an option). Model 3, unveiled in 1981, includes some features not available on the Model 1, including more extensive editing functions and multipoint operation. It does not, however, include the ergonomic features found on the Model 1.

The 7910 is the newest member of the 7900 family, having been introduced in September 1983. Despite carrying a price tag considerably lower than that of the 7900 Model 3, the 7910 contains the most extensive set of features avail- ▷

NCR's 7900 Series of display terminals includes four ASCII terminals designed primarily for use with the company's mainframes and minicomputer systems. Offerings range from a low-priced, conversational terminal to a fully-featured smart unit. A wide variety of functions and ergonomic features are available, depending on the model selected.

MODELS: 7900 Model 1, 7900 Model 3, 7901, and 7910.
DISPLAY: A 12-inch display is standard on the 7900 Models 1 and 3 and on the 7901; a 15-inch display is standard on the 7910. Characters are displayed in amber on the 7900 Model 1 and 7910, and green on the 7900 Model 3 and 7901.
KEYBOARD: A detachable, typewriter-style keyboard is standard on the 7900 Model 1, 7901, and 7910; an integral keyboard is standard on the 7900 Model 3, with a detachable version available optionally.
COMPETITION: Datamaxx U.S.A. and Falco Data Products offer terminals with NCR emulation.
PRICE: Purchase prices range from $850 to $3,670; one- and three-year leases are available for all models except the 7901.

CHARACTERISTICS

VENDOR: NCR Corporation, World Headquarters, Dayton, Ohio 45479. Telephone (513) 445-5000.

DATE OF ANNOUNCEMENT: 7900 Model 1—October 1979; 7900 Model 3—April 1981; 7901—February 1982; 7910—September 1983.

DATE OF FIRST DELIVERY: 7900 Model 1—January 1980; 7900 Model 3—June 1981, 7901—May 1982; 7910—September 1983.

NUMBER DELIVERED TO DATE: Approximately 100,000 terminals worldwide (all models).

SERVICED BY: NCR.

MODELS

The NCR 7900 family consists of the following asynchronous ASCII terminals:

7900 Model 1—an interactive terminal, plug-compatible with its predecessor the NCR 796-101. Standard features include a 12-inch amber display, tilt/swivel monitor, and detachable keyboard.

7900 Model 3—contains more extensive functions than those found on the 7900 Model 1 (including full editing capabilities), plus multipoint operation (pollable and ad- ▶

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▷ able in the 7900 family. These include: a 15-inch amber display; four pages of display memory; full editing capabilities; 80/132-column display capability; business graphics; split screen; an ergonomic design, including tilt/swivel monitor and detachable keyboard; an optional RS-422 interface; and conformity with the ANSI X3.64 standard.

COMPETITIVE POSITION

NCR is an established vendor of mainframes and minicomputer systems, with special emphasis in the banking and retail markets. The 7900 Series display terminals are designed for use primarily with NCR systems, including the V-8500/V-8600, I-9000, and 9300; thus, their competition in this area is limited. Datamaxx (Maxxima Series) and Falco Data Products (TS-1) are two vendors who provide NCR emulation on their terminal products.

Applied Digital Data Systems (ADDS), a long-time leader in the general-purpose ASCII terminal industry, is a subsidiary of NCR; however, NCR itself does not compete directly in this market.

ADVANTAGES AND RESTRICTIONS

The 7900 Display Terminals, the first of which (Model 1) was introduced in 1979, are successors to NCR's 796 Series terminals. The 7900 Model 1 has been recently redesigned to include ergonomic features such as a tilt/swivel monitor, amber phosphor screen, and a standard detachable keyboard (formerly available as an option). The terminal contains limited editing features (erase only) and carries a somewhat high price tag ($1,500 quantity one); this, however, is not unusual for a "captive market" product such as this. The 7900 Model 3 contains more extensive features than those found on the Model 1; it does not, however, include the improved ergonomic design, and its price is considerably higher.

NCR has improved the price/performance ratio of its display terminal line with the addition of the 7901 and 7910. The 7901 is a character mode version of the 7900 Model 1 with the lowest price ($850 quantity one) of any 7900 series terminal. The 7910 contains features not found on any 7900 family member (132-columns display, four pages of memory), and sells for a price more in line with the ASCII display terminal market ($1,995 quantity one).

On all 7900 models extensive built-in shields protect the terminals from electromagnetic interference, radio frequency interference, and electrostatic discharge. In addition, low-power consumption has eliminated the need for a cooling fan.

Due to an insufficient number of responses on the NCR 7900 Display Terminals in Datapro's 1983 Terminal Users Survey, no User Reaction section is included in this report.□

▶ dressable). Standard features include a 12-inch amber display and integral keyboard; a detachable keyboard is optional.

7901—a low-end, conversational terminal. Standard features include a 12-inch green display, tiltable monitor, and detachable keyboard.

7910—a fully-featured interactive terminal. Standard features include a 15-inch amber display, tilt/swivel monitor, detachable keyboard, full editing capabilities, 80/132-column display formats, four pages of display memory, split screen, and business graphics. The 7910 conforms to the ANSI X3.64 standard, and is fully compatible with the 7900 Models 1 and 3, as well as the 7900 Model 4, which is no longer available.

TRANSMISSION SPECIFICATIONS

Transmission is character by character for the 7901, and by character, line, or block for all other models. Communications interface software is stored in the Read Only Memory (ROM) and operates with other terminal firmware. The interface enables EIA RS-232-C/CCITT V.24 and current loop communications in full- or half-duplex on two/four wire networks. Half-duplex operation supports the reverse channel option when working through a modem. All models have asynchronous switch-selectable speeds of up to 19,200 bps (except up to 9600 bps on the 7900 Model 3).

ASCII code is generated in conversational or line message mode. Odd, even, mark, or space parity is selectable. A message mode for block transmission of selected lines is standard.

Error checking is performed by monitoring for parity, overrun, and framing error. The interface provides for the detection of primary and secondary breaks. Major RS-232-C/CCITT control signals are monitored for interface integrity and error messages are displayed when necessary. An RS-422 interface is optional on the 7910.

The NCR 7900 can be used in three types of system configurations: point-to-point, dial-in, or in-house. A *point-to-point* arrangement provides a communications link in which a private leased-line is dedicated to a single CRT terminal. In this arrangement, the terminal has constant access to the CPU via a two-wire or four-wire telephone line and two data sets.

A *dial-in* arrangement uses the public telephone network instead of private leased lines. The remote terminal operator uses a data set or a standard telephone and an acoustic coupler to establish a communication link with the system CPU each time the line is needed; a data set is used at the system CPU in all cases.

In-house operation is performed by directly connecting the EIA/Current Loop connector on the terminal's back panel to a computer for in-house operation without data sets. Normally, the EIA connection is used; the current loop is generally utilized only in environments where electrical noise is high. Transmission speed is controlled by the transmission rate switch on the back panel; any of the available speeds can be used.

The Model 3 can be configured for multipoint operation. Each site can contain a single terminal or a group of terminals, connected by a special daisy chain cable. Up to 96 terminals may be used in a cluster. In multipoint operation, each terminal or cluster must be equipped with its own modem.

DEVICE CONTROL

The operating modes include local and remote, wrap and roll, half- and full-duplex, and conversation and message modes. A full 96 function code set is available. Message mode is not available on the 7901.

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▶ A range of visual attributes are available on all models; including underline, blink, blank, and reverse video. Bold and double–size characters are available on the 7910.

On the 7900 Model 1 and 7901, the only editing function available is Erase. Full editing functions, including insert/delete line and character, are available on the 7900 Model 3 and 7910. Enhanced features on the 7910 include four pages of display memory (which may be scrolled through), and split screen capability.

Terminal performance is tested by internal ROM-based diagnostics every time the terminal is powered up. The condition is shown by eight possible error codes and is displayed on the Status (25th) line of the screen. This line consists of 12 fields in reverse video and displays communications status, modes of operation, error status, type of interface, keyboard status, and transmission status.

The cursor is set by switches located on the back panel, and can be displayed as a blinking underline, solid underline, blinking reverse video block or a solid reverse video block.

COMPONENTS

CRT DISPLAY UNIT: A 12–inch (diagonally measured) display screen is standard on the 7900 Model 1, 7900 Model 3, and 7901. The display screen on the 7910 measures 15 inches diagonally. Display formats of 24 lines by 80 characters are standard on all models. A 25th line for the display of terminal status information is standard on all models except the 7901. In addition, the 7910 also offers a 24–line by 132–character format, with 25th status line. Characters are displayed in amber on the 7900 Model 1 and 7910, and in green (P31 phosphor) on the 7900 Model 3 and 7901. Characters are formed via a 7–by–7 dot matrix on the 7900 Models 1 and 3, a 5–by–7 dot matrix on the 7901, and 7–by–9 (80–column) or 5–by–9 (132–column) dot matrices on the 7910.

The 96–character ASCII set is displayable on the 7901; all other models provide the 128–character ASCII set. The 7910 also provides 32 graphics characters and 96 international symbols. A tilt/swivel capability is standard on the 7900 Model 1 and 7910; the 7901 provides a tilt capability only.

KEYBOARD: All models feature a keyboard with a typewriter–style layout. A detachable keyboard is standard on the 7900 Model 1, 7901, and 7910; it is optional on the 7900 Model 3. The keyboard is divided into three basic key groups: a 56–key main array, with nine control keys; a row of five cursor control keys; and a 14–key numeric pad. As an option on the 7900 Models 1 and 3, the numeric pad can be arranged to match the layout of a touch–tone telephone.

Standard keyboard features include horizontal tab, N–key rollover, and adjustable audible key click. Fifteen internal character sets are available.

PRICING

NCR 7900 terminals are available for purchase, or on a one-year or three-year lease (except the 7901, which is purchase only). Quantity discounts are available.
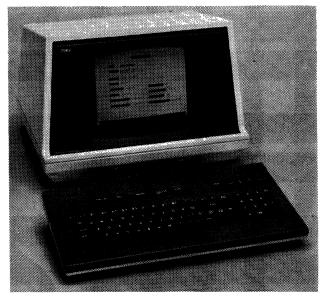
EQUIPMENT PRICES

Monthly Charge*

	1-Year Lease	2-Year Lease	Purchase	Monthly Maint.
7900 Model 1	$108	$ 97	$1,500	$19.00
7900 Model 3 (w/integral keyboard)	176	165	3,500	30.50
7900 Model 3 (w/detachable keyboard)	182	171	3,670	30.50
7901	—	—	850	15.00
7910	159	135	1,995	18.00
Touch-tone numeric pad (7900 Models 1 and 3)	—	—	150	—

*Includes maintenance.

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NCR 7900 Display Terminals

The NCR 7900 terminals are available with a detachable keyboard option. The Model 1 (shown here) features interactive operation enhanced by a number of video attributes.

NCR's Teletype-compatible display terminals.

The Model 1 is an interactive terminal designed to replace the NCR 796-101. The Model 3 is an asynchronous poll/select terminal which replaces the NCR 796-301.

Both models transmit data at switch-selectable rates from 50 to 9600 bps (19,200 bps for the Model 1). Additional features include editing capabilities (Model 3 only), switch-selectable modes of operation, built-in diagnostics, and electrical interference shielding.

The base price for the Model 1 is $2,000, or $100 per month on a one-year lease. The Model 3 sells for $3,500, or $171 per month. Quantity discounts are available.

MANAGEMENT SUMMARY

NCR Corporation began delivery of its 7900 Model 1 ASCII terminal in early 1980, as a plug-compatible replacement for its popular Model 796-101. Since then, it has introduced the 7900 Model 3, a pollable ASCII terminal designed to succeed the Model 796-301.

The Model 1 is designed for interactive, on-line, multiprogramming environments. The Model 3 contains a number of editing capabilities and is designed for polled communications with a remote computer.

Both models contain a 12-inch diagonal, green phosphor CRT display. The non-glare screen displays 2000 characters over 25 lines of 80 characters each. Characters are formed by a 7-by-9 dot matrix within a 10-by-12 character cell. The Model 1 utilizes 64, 96, or 128 switch selectable ASCII characters; the Model 3 utilizes a 128 ASCII character set. The user has the option of viewing green characters on a dark background or dark characters on a green background.

The operation modes include local or remote, wrap or roll, half- or full-duplex, and conversational or message. The terminals provide asynchronous ASCII transmission over public or dedicated lines at switch-selectable speeds of 50 to 9600 bps (19,200 bps for the Model 1). The transmission speed can be selected locally or at the central CPU.

Extensive built-in shields protect the terminal from electro-magnetic interference, radio frequency interference, and electro-static discharge. In addition, low ▷

CHARACTERISTICS

VENDOR: NCR Corporation, Dayton, Ohio 45479. Telephone (513) 445-5000.

DATE OF ANNOUNCEMENT: Model 1 — October 1979; Model 3 — April 1981.

DATE OF FIRST DELIVERY: Model 1 — January 1980; Model 3 — June 1981.

NUMBER DELIVERED TO DATE: Approximately 10,000 Model 1s and 2000 Model 3s.

SERVICED BY: NCR.

MODELS

Two NCR 7900 models are currently available:

Model 1 — an asynchronous ASCII terminal. Plug-compatible without software modification with the NCR model 796-101, it is designed for interactive, on-line, multiprogramming environments.

Model 3 — an asynchronous ASCII terminal with editing capabilities. The Model 3 is designed for polled communications with a remote computer, and is plug-compatible without software modification with the NCR model 796-301.

TRANSMISSION SPECIFICATIONS

Transmission is character by character for the Model 1, and by character, line, or block with the Model 3. Communications interface software is stored in the Read Only Memory (ROM) and operates with other terminal firmware. The interface enables EIA RS-232-C/CCITT V.24 and current loop communications in full- or half-duplex on two/four wire networks. Half-duplex operation supports the reverse channel option when working through a modem. Both models have asynchronous switch-selectable speeds of 50, 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, and 9600; 19,200 bps transmission is available with the ▶

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▷power consumption has eliminated the need for a cooling fan.

NCR has plans to further expand the product line to include a replacement for the Model 796-401 terminal.

NCR Corporation did not supply Datapro with a list of 7900 Model users, and no users of these terminals responded to Datapro's 1981 survey on alphanumeric displays. Therefore, no User Reaction section appears in this report.□

▶Model 1 only. ASCII code is generated in conversational or line message mode. Odd, even, mark, or space parity is selectable. A message mode for block transmission of selected lines is standard.

Error checking is performed by monitoring for parity, overrun, and framing error. The interface provides for the detection of primary and secondary breaks. Major RS-232-C/CCITT control signals are monitored for interface integrity and error messages are displayed when necessary.

The NCR 7900 can be used in three types of system configurations: point-to-point, dial-in, or in-house. A *point-to-point* arrangement provides a communications link in which a private leased-line is dedicated to a single CRT terminal. In this arrangement, the terminal has constant access to the CPU via a 2-wire or 4-wire telephone line and two data sets.

A dial-in arrangement uses the public telephone network instead of private leased lines. The remote terminal operator uses a data set or a standard telephone and an acoustic coupler to establish a communication link with the system CPU each time the line is needed; a data set is used at the system CPU in all cases.

In-house operation is performed by directly connecting the EIA/Current Loop connector on the terminal's back panel to a computer for in-house operation without data sets. Normally, the EIA connection is used; the current loop is generally utilized only in environments where electrical noise is high. Transmission speed is controlled by the transmission rate switch on the back panel; any of the available speeds can be used.

The Model 3 can be configured for multipoint operation. Each site can contain a single terminal or a group of terminals, connected by a special daisy chain cable. Up to 96 terminals may be used in a cluster. In multipoint operation, each terminal or cluster must be equipped with its own modem.

DEVICE CONTROL

The operating modes include local and remote, wrap and roll, half- and full-duplex, and conversation and message modes. A full 96 function code set is available.

The terminal operates under the control of ROM-based stored programs that are an integral part of the logic. The ·

stored program determines the basis of the model configuration and is not subject to change by the user.

The terminal is performance tested by internal ROM-based diagnostics every time the terminal is powered up. The condition is shown by eight possible error codes and is displayed on the Status (25th) line of the screen. This line consists of twelve fields in reverse video and displays communications status, modes of operation, error status, type of interface, keyboard status, and transmission status.

The cursor is set by switches located on the back panel, and can be displayed as a blinking underline, solid underline, blinking reverse video block or a solid reverse video block.

COMPONENTS

CRT DISPLAY UNIT: A 12-inch diagonal, green phosphor (P31) screen that displays 24 data lines of 80 characters each for a total of 1920 displayable positions. The 25th line of the screen is used to display terminal status. Each character is a configuration of a 7 x 9 dot pattern in a 10 x 12 dot matrix character cell. The Model 1 print set includes 64, 96, or 128 switch-selectable upper/lower case ASCII characters. The Model 3 utilizes a 128-character ASCII code set. The characters are displayed as dark characters on a green background or green characters on a dark background. Display characteristics such as normal or reverse video with combinations of underlining, blinking, and half intensity are available through the use of keyboard controls or via the CPU. An audible alarm is standard.

KEYBOARD: Both models utilize a standard typewriter-style keyboard divided into three basic key groups: the 56-key main keyboard, with nine control keys; a row of five cursor control keys; and a 14-key numeric pad.

In addition, the Model 1 keyboard contains a row of five mode control keys: Function, Roll (Roll & Wrap mode), Printer, Auto Line Feed, and Local mode. The Model 3 keyboard contains a row of ten special function keys. These include Transmit, Page, Format, Local, Tag, Break, Insert/Delete Line, and Insert/Delete character.

A detachable keyboard with a 48-inch coiled cord and a numeric pad with a telephone-type layout are optional. Other keyboard features include horizontal tab, N-key rollover, and an adjustable audible keyclick. Fifteen international character sets are available.

PRINTER: The 7900 Model 1 is equipped with a serial interface for operating the NCR 260 RO Serial Printer, NCR 6440 Matrix Printer, or similar device. The Model 3 is available with either a bit-parallel or 260-9 interface. The operator or CPU can initiate or terminate the printing cycle.
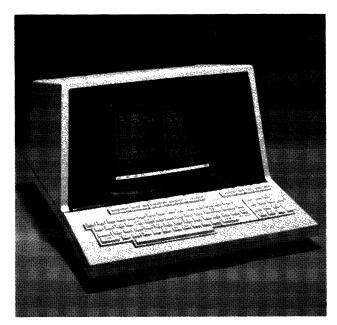
PRICING

NCR 7900 terminals are available for purchase, or on a one-year or three-year lease. Quantity discounts are available.

	Purchase	Monthly Maintenance	Monthly Charge* 1-Year Lease	3-Year Lease
NCR 7900, Model 1 w/detachable keyboard	$2,000	$25	$100	$89
	2,170	25	106	95
NCR 7900, Model 3 w/detachable keyboard	3,500	30.50	171	160
	3,670	30.50	177	166
Touch-tone numeric pad (available for both models)	150	—	—	—
Daisy chain cable (Model 3 only)	50+$3/meter above 3 meters			

*Includes maintenance.■

NCR 7900 Model 1 Display Terminal

The first in a new series of microprocessor-controlled display terminals offered by NCR, the 7900 Model 1 is highlighted by low power consumption and shields against electro-magnetic interference.

A microprocessor-controlled, interactive data display terminal designed to replace the NCR 796-101. This teletype-compatible terminal operates under firmware control to send and receive data either locally or remotely using public or private communication facilities.

The 7900 Model 1 transmits data in an asynchronous mode at switch-selectable rates up to 19.2K baud. Additional features include switch-selectable modes of operation; built in diagnostics; optional touch-tone keypad; reduced power consumption; and extensive shields against electro-magnetic, radio, and electro-static interference.

The new terminal rents for $95 per month or can be purchased for $2,000.

MANAGEMENT SUMMARY

The NCR 7900 Model 1 is the first in a projected line of desk-top, teletype-compatible intelligent display terminals. It is intended to replace the earlier Model 796-101 and operates with a variety of NCR computers ranging from a low-end, small business system up to a large-scale mainframe. Because it is plug-compatible with the 796-101, present 796-101 installations can upgrade to the 7900 without interruption to operations.

The microprocessor controlled 7900 operates in inter-active, on-line, distributive, and multiprogramming environments. In a multiprogramming environment, entry and retrieval can take place simultaneously from multiple terminals with the systems resources appearing to be dedicated to a single terminal.

Power consumption of the 7900 has been cut by approximately one-third over that of its predecessor. The lower power consumption and cooler operation eliminate the need for a cooling fan resulting in quieter operation. The terminal measures 17½ inches wide by 20 inches deep and weighs only 25 pounds.

The green phosphor, 12-inch diagonal, non-glare CRT screen displays 25 lines of 80-characters each. The 64, 96, or 128 switch-selectable ASCII characters are formed by a 7 x 7 dot matrix. The user has the option of viewing green characters on a black background or black characters on a green background. ▷

CHARACTERISTICS

VENDOR: NCR Corporation, Dayton, Ohio 45479. Telephone (513) 449-2150.

DATE OF ANNOUNCEMENT: January 1980.

DATE OF FIRST DELIVERY: October 1979.

NUMBER DELIVERED TO DATE: Approximately 3,000.

SERVICED BY: NCR.

TRANSMISSION SPECIFICATIONS

Communications interface software is stored in the Read Only Memory (ROM) and operates with other terminal firmware. The interface enables EIA RS-232-C/CCITT and current loop communications in full- or half-duplex on two/four wire networks. Half-duplex operation supports the reverse channel option when working through a modem. Asynchronous switch-selectable speeds of 50, 75, 110, 134.5, 150, 300, 600, 1,200, 1,800, 2,000, 2,400, 3,600, 4,800, 7,200, 9,600, and 19,200 bits per second are available. ASCII code is generated in conversational or line message mode. Parity is available for odd, even, mark, or space, and stop bits programmed for one or two positions. A Message mode for block transmission of selected lines is standard.

Error checking is performed by monitoring for parity, over-run, and framing error. The interface provides for the detection of primary and secondary breaks. Major RS-232-C/CCITT control signals are monitored for interface integrity and error messages are displayed when necessary.

The 7900 Model 1 can be used in three types of system configurations: point-to-point, dial-in, or in-house. *Point-to-Point System* is a communications link in which a private leased-line is dedicated to a single CRT terminal. In this arrangement, the terminal has constant access to the CPU via a 2-wire or 4-wire telephone line and two data sets. When using a 2-wire line, the user selects the terminal's ▶

NCR 7900 Model 1 Display Terminal

▷ The operation modes include local and remote, wrap and roll, half- and full-duplex, and conversational or message. The terminal provides asynchronous ASCII transmission over public or dedicated lines at switch-selectable speeds of 50 to 19,200 bits per second. The transmission speed can be selected locally or at the central CPU.

Extensive built-in shields protect the terminal from electro-magnetic interference, radio frequency interference, and electro-static discharge.

Unlike its predecessor which NCR purchased from Applied Digital Data Systems (ADDS) on an OEM contract, the 7900 Model 1 is manufactured by NCR. It is the first in a plan to "vertically integrate" display manufacturing operations.□

▶ highest transmission speed that can be used with a 2-wire system. When the terminal is used in an established system or when other equipment is added to the system that limits the line speed, the terminal must be operated at the established line speed.

Dial-In System uses the public switched telephone network instead of private leased lines. The remote terminal operator uses a data set or a standard telephone and an acoustic coupler to establish a communication link with the system CPU each time the line is needed; a data set is used at the system CPU in all cases. Communication is established in a manner similar to using a standard telephone. When the CPU detects a call, it acknowledges that call with an audible tone, which instructs the operator to proceed with data transfer. If an operator dials the system CPU while it is being used by another terminal, a busy signal occurs and the operator must try again later. If desired, the CPU can be supplied with several consecutive numbers and an automatic switching device. A remote terminal calling the first of these numbers is automatically switched to the first available number and its associated data set.

In-House (EIA) System operation is performed by directly connecting the EIA/Current Loop connector on the terminal's back panel to a computer for in-house operation without data sets. Normally, the computer manufacturer supplies a point at which the terminal can be plugged directly into the computer's communications hardware using the standard EIA data set cable. *In-House (Current Loop)* is utilized in environments where electrical noise is high. The EIA/Current Loop connector on the terminal may be directly connected to the computer via the 20 mA current loop interface. Transmission speed is controlled by the transmission rate switch on the back panel. Any of the available speeds can be used.

DEVICE CONTROL

The operating modes include local and remote, wrap and roll, half- and full-duplex, and conversation or message modes. A full 96 function code set is available.

The terminal operates under the control of ROM-based stored programs that are an integral part of the logic. The stored program determines the basis of the model configuration and is not subject to change by the user.

The terminal is performance tested by internal ROM-based diagnostics everytime the terminal is powered up. The condition is shown by eight possible error codes and is displayed on the Status (25th) line of the screen. This line consists of several fields in reverse video and displays communications status, modes of operation, error status, type of interface, keyboard status, and transmission status.

The cursor (six dots wide) is used to inform the operator of the position of the next character to appear on the screen. It may be set by switches, located on the back panel, to be displayed as a blinking underline, solid underline, blinking reverse video block or a solid reverse video block.
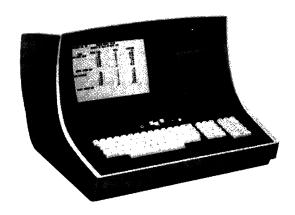
COMPONENTS

CRT DISPLAY UNIT: A 12-inch diagonal, green phosphor display screen that displays 24 data lines of 80-characters each with a total of 1920 displayable positions. The 25th line of the screen is used to display terminal status. Each character is a configuration of a 7 x 7 dot pattern in a 10 x 12 dot matrix character cell. The print set includes 64, 96, or 128 switch-selectable upper/lower case ASCII characters. The characters are displayed as black characters on a green background or green characters on a black background. Display characteristics such as normal or reverse video with combinations of underlining, blinking and half intensity are available through the use of keyboard controls or via the CPU.

KEYBOARD: Communications type unit that is included in the terminal cabinet. The keys are divided into four groups: the main keyboard, mode control keys, cursor control keys, and a standard numeric keypad; an optional touch-tone keypad arrangement is available. All keys in the main keyboard and the keypad (with the exception of SHIFT, CONTROL, REPEAT, and BREAK) are encoded keys; that is, they generate ASCII codes for transmission to the CPU and cause characters to be displayed on the screen. The cursor control keys cause the cursor to move to a new location on the screen and generate ASCII codes for transmission. The main keyboard consists of 56 keys arranged in a typewriter manner. They contain the normal alphanumeric keys for data entry as well as function keys for machine operation and generation of control codes. The function keys in the main key group include BREAK, CONTROL, ESC (Escape), LINE FEED, NEW LINE, REP (Repeat), RUB OUT, SCREEN ERSE (Screen Erase), and SHIFT. The Model Control Keys are five separate functions keys located above the main keyboard. They include FUNCTION KEY, ROLL KEY (Roll Mode), ROLL KEY (Wrap Mode), PRINTER KEY, AUTO LINE FEED, and LOCAL. These keys are used by the operator to control the operating mode of the terminal. The Cursor Control keys consists of five cursor movement keys including HOME, CURSOR RIGHT, CURSOR LEFT, CURSOR DOWN, and CURSOR UP.

PRINTER: The 7900 Model 1 is equipped with a serial interface for operating the NCR 260 RO Serial Printer, NCR 6440 Matrix Printer or similar device. The operator or CPU can initiate or terminate the printing cycle. By depressing the Printer key, the operator either enables or disables the RS-232-C serial interface. When the printer is enabled, the PTR is displayed on the status line. The only way keyed data is printed is if the "echo" feature switch located on the back panel is enabled. In a full-duplex state, only the keyboard generated data that is returned by the CPU for display is printed. In either half- or full-duplex, the transmission speed is limited by the speed of the printer if the printer is unbuffered. When the printer is used for printing messages from the CPU, the output message must include pad characters following certain control characters. The pad character allows time for the printer to perform such functions as carriage return and line feed.

PRICING

The 7900 Model 1 is available for purchase at $2,000. One- and three-year leases are available at $95 and $85 per month, respectively. The maintenance charge is $300 per year.■

NCR 796 Series Display Terminals

An ADDS Consul model? Yes, with the NCR nameplate. A top-of-the line model, the 796-301 has the same physical appearance as the rest of the models, but offers more features than the other asynchronous models. Reverse video is the standard display technique for all models.

A family of stand-alone keyboard/display terminals featuring Teletype compatibility or ASCII bisynchronous transmission.

Features include serial or parallel printer interfaces; ASCII code; conversational, message (line), or page (block) transmission; protected format; and limited graphics. An impact or non-impact printer is optional.

The four models are available for purchase or on a 1-, 3-, or 5-year lease. Purchase prices range from $2,000 to $3,750 (quantity discounts are available); 5-year lease charges are $75 to $145, including maintenance.

MANAGEMENT SUMMARY

NCR currently offers four terminal models in its 796 series. The three older models, 796-101, -301, and -401, are Teletype-compatible units that feature asynchronous half- or full-duplex transmission. The newest model, 796-501, offers ASCII bisynchronous transmission compatible with NCR Century/Criterion software. The terminal is also compatible with non-NCR systems on which user provides appropriate software support. The 796-501 is similar to the top-of-the line Model 796-301 in terms of most other features and functions.

All models have the same physical appearance and are equipped with a 12-inch CRT and integral keyboard. A serial or parallel printer interface is available on all units and accommodates a choice of NCR impact or non-impact printers. A limited graphics capability is optional on the 796-301 and standard on the 796-401 and -501.

The terminals are purchased from Applied Digital Data Systems (ADDS) under OEM contracts dating back to September 1973. NCR had purchased an equity position in ADDS amounting to 7 percent of the company's common stock. The NCR 796 Series are the ADDS Consul series. Model 796-101 is the ADDS Consul 580; Model 796-301, the Consul 880A; the 796-401, the Consul 980; and the 796-501, the Consul 980A.

The salient features of the 796 Series include:

● Character, line, or page transmission.

● Switchable transmission rates from 110 bps to 9600 bps.

CHARACTERISTICS

VENDOR: NCR Corporation, Dayton, Ohio 45479. Telephone (513) 449-2150.

DATE OF ANNOUNCEMENT: Models 796-101, -201, and -301—January 1973; Model 796-401—September 1975; Model 796-501—August 1978.

DATE OF FIRST DELIVERY: Models 796-101, -201 and -301—March 1973; Model 796-401—November 1975; Model 796-501—August 1978.

NUMBER DELIVERED TO DATE: Over 20,000.

SERVICED BY: NCR.

MODELS

The NCR 796 series terminals currently include four stand-alone models with integral keyboards. They are Model 796-101, 796-301, 796-401, and 796-501. A printer interface is optional on Model 796-301 and standard on all other models. Model 796-101 provides a serial interface that accommodates an NCR Model 260-8 thermal printer or Model 6440 matrix line printer. All other models provide a parallel interface that accommodates an NCR Model 260-9 thermal printer or Model 6440 matrix line printer.

TRANSMISSION SPECIFICATIONS

● **Model 796-101**—When equipped with an RS-232C or CCITT V. 24 interface, speeds are selectable at 110, 1200, 2400, and 9600 bits/second. Other speeds can be specified. When equipped with a 20 mA dc current loop interface, speeds are switch selectable at 110, 300, 1200, 2400, and 9600 bits/second.

● **Model 796-401**—Can be equipped with an RS-232C or 20 ma dc current loop interface. Transmission speeds are switch-selectable at 110, 300, 1200, 2400, or 9600 bits/second with either the RS-232C or current loop interface.

● **Model 796-301**—Equipped with an RS-232C, CCITT V. 24 or 20 mA dc current loop interface and provides switch-selectable speeds of 110, 300, 1200, 1800, and 2400 bits/second. Other speeds can be specified. The terminal has a polling capability and is designed for multipoint or daisy-chained transmission.

NCR 796 Series Display Terminals

▷ ● 1920 character screen capacity.

● An addressable cursor.

● Individual cursor control keys.

● A numeric pad.

● Editing.

● Format protection.

● Graphics.

● Optional printed output (interface is standard).

● An RS-232C or current loop interface.

● 64 or 96 displayable symbols.

● Polling.

Not all these features are combined in one model; however, each model includes many of them, and the features are distributed among models to satisfy both unsophisticated and sophisticated applications.

USER REACTION

In Datapro's 1979 survey of alphanumeric display terminal users, 7 users reported on their experience with 213 NCR 796 Series terminals. Their ratings are presented below.

	Excellent	Good	Fair	Poor	WA*
Overall performance	3	4	0	0	3.4
Ease of operation	4	3	0	0	3.6
Display clarity	4	2	1	0	3.4
Keyboard feel and usability	2	3	1	1	2.9
Hardware reliability	2	5	0	0	3.3
Maintenance	2	3	1	1	2.9
Software and technical support	2	3	0	1	3.0

*Weighted Average based on a scale of 4.0 for Excellent.

These users cited low cost, flexibility, and compact size as the key advantages. No significant disadvantages were mentioned.□

▶ All of the above models provide Teletype compatibility. The 10- or 11-unit, 8-level ASCII transmission code is used. Each character transmitted includes a start bit; 7 data bits; a parity, mark, or space bit; and one or two (at 110 bps) stop bits. The eighth bit is switch-selectable for odd or even parity, mark ("1") or space ("0").

● Model 796-501—Communications protocol is compatible with ASCII bisynchronous line discipline supported by NCR Century/Criterion systems software. The terminal is also compatible with non-NCR systems on which the user provides appropriate software support. It is *not* compatible with IBM BSC protocol. An 8-level (7 data bits + parity bit) ASCII transmission code is used. An RS-232C or 20 mA dc current loop interface is standard. Transmission is synchronous, half-duplex, at speeds of 2400, 4800, or 9600 bps. The terminal has a polling capability and is designed for multipoint or daisy-chain transmission. Up to 32 terminals can be included on the daisy chain.

DEVICE CONTROL

Model 796-101: Transmission is performed in a character-by-character basis only. Remote or keyed commands execute carriage return, line feed, screen erase, cursor control, keyboard lock/unlock functions, and printer control (on and off). Cursor functions include up, down, left, right, and home. A roll function causes data to roll by one line as a new line is keyed or received; data rolled off the screen is lost. An auto line feed function causes an automatic line feed for each carriage return. Printer controls provide on- and off-line (local) printing functions.

Model 796-401: Provides three operating modes: Conversational, Message, and Page. Conversational mode transmits a character for each key depression. Message mode transmits a line at a time (up to 80 characters). Page mode transmits up to a full page of data (up to 1920 characters). The cursor is addressable and can be positioned to any location by remote command. Cursor controls include up, down, left, right, and home. Tab and screen erase functions are also provided. Format protection restricts data entry to unprotected fields; protected fields are displayed at half intensity. Only unprotected fields are transmitted. Edit controls include character and line insertion and deletion. Printer controls provide on- and off-line (local) printing functions.

Model 796-301/-501: Provides two operating modes: Message and Page. Message mode transmits a line at a time (up to 80 characters). Page mode transmits up to a full page of data (1920 characters). The cursor is addressable and can be positioned to any location by remote command. Cursor controls include up, down, left, right, and home. Tab and screen erase functions are also provided. Format protection restricts data entry to unprotected fields, protected fields are displayed at half intensity. Only unprotected fields are transmitted. Edit controls include character insertion and deletion. Line insertion and deletion is also featured on the 796-501 only. Printer controls provide on- and off-line (local) printing functions. Two user-definable program function keys are provided on the 796-501 only for storage of program function sequences.

COMPONENTS

CRT DISPLAY UNIT: A 12-inch (diagonal measurement) CRT with a viewing area 9 inches wide by 6 inches high. The display arrangement for all models is 24 lines of 80 characters each for a total screen capacity of 1920 characters. The standard character set for Models 796-101 and -301 is 64 displayable symbols that include upper-case alphabetics only; Models 796-401 and -501 feature 96 displayable symbols including upper and lower case alphabetics and numerics plus 32 special ASCII symbols. Each character is formed via a 5-by-7 dot matrix. Data is displayed in black (reverse video). A limited graphics feature is optional on Model 796-301 and standard on Model 796-401 and -501. The graphics feature displays graphic data via a matrix of 11,520 elements. The matrix arrangement is composed of 72 vertical by 160 horizontal dots.

MODEL 796-101 KEYBOARD: A teletypewriter style attached keyboard. The main keygroup consists of 54 keys including functions for Erase, New Line, Break, Rub Out, Line Feed, Repeat, Escape, Space, Shift, and Control Shift. An 11-key numeric pad (including decimal point) and an 18-key cluster of 5 cursor and 2 printer control keys and 6 blank (undefined) keys are located to the right of the main keygroup. Roll, Auto Line Feed, and Full Duplex mode keys are located over the main keygroup. The keyboard can generate any of 128 ASCII character codes. ▶

NCR 796 Series Display Terminals

▶ **MODELS 796-301/-401/-501 KEYBOARD:** A teletype-writer-style attached keyboard. The main keygroup is identical with Model 796-101. An 11-key numeric pad and a 13-key cluster of function keys including 5 cursor, 2 printer, 2 tab (start and stop), 2 edit (insert and delete) and 2 format (on or off) control keys are located to the right of the main keygroup. The Mode Control keys are located over the main keyboard (Conversational/Message/Page, depending on model).

MODEL 796-501 KEYBOARD: A teletypewriter-style attached keyboard. The main keygroup is identical with Model 796-101. A 12-key numeric pad (including a tab key) and a 15-key cluster of function keys, including 5 cursor, 2 printer, 2 tab (start and stop), 2 exit (insert and delete) and 2 format (on and off) control keys and 2 user-defined program function keys, are located to the right of the main keygroup. The Mode Control (Message/Page) keys are located over the main keygroup.

NON-IMPACT PRINTERS: The NCC 260-8 (serial interface) and 260-9 (parallel interface) printers are non-impact printers that use an electrothermal printing technique. Characters are formed within a 5-by-7 dot matrix; character size is 0.110 inch high by 0.082 inch wide. The 260-8/-9 prints any of 94 ASCII symbols, including upper and lower case alphabetics, numerics, and special characters, at 30 char/second. Lower case letters are printed as capitalized, half-size equivalents of the corresponding upper case letters. Line length is 80 characters (8 inches). Horizontal and vertical spacing are 10 char/inch and 6 lines/inch, respectively. The printer has a friction-feed platen and accommodates a 100-foot or (optionally) 430-foot roll of 8.5-inch-wide NCR thermal paper, which fits inside the printer.

Model 260-8 attaches to the Model 796-101 via a serial interface; Model 260-9 attaches to Models 796-301, -401, or -501 via a parallel interface. Model 260-8 also has its own communications capabilities and can stand alone as an RO teleprinter terminal. Model 260-9 has no communications capabilities and operates only as a slave printer.

IMPACT PRINTERS: NCR Models 6440-0202, -0302, and -0402 provide impact matrix line printing at speeds of 125, 70, or 50 lines per minute respectively using a 7-by-7 dot matrix for a 132-column print line. Models -0302 and -0402 are equipped with "position seeking" bidirectional print-heads that minimize printhead movement and can print a 33-column print line using a 7-by-7 dot matrix at 155 and 200 lines per minute. Model -0202 has dual bidirectional print-heads but lacks the "position-seeking" feature. Optional 9-by-7 and 9-by-9 dot matrix configurations are available on Models -0202 and -0302. A 64-character ASCII character set is standard on all models; a 64-character OCR set and a 96-character (upper/lower case) set are optional on Models -0202 and -0302. Horizontal and vertical spacing are 10 characters per inch and 6 lines per inch respectively; optional spacing of 10/16.5 characters per inch (Model -0302) and 6/8 lines per inch (Models -0202 and -0302) are also available. Each unit can handle 5-part continuous forms 4 to 16.5 inches wide and 3.5 to 17 inches long. Model 6440 printers attach to the Model 796-101 via a serial interface and to Models 796-301, -401, or -501 via a parallel interface. Models -0202 and -0302 also have their own communications capabilities and can stand alone as RO teleprinter terminals. Model -0402 has no communications capabilities and operates only as a slave printer.

PRICING

The NCR 796 Series display terminals are available for purchase or on a 1-, 3-, or 5-year lease, which includes full maintenance. A separate maintenance contract is available for purchased equipment. Quantity discounts are available for purchased equipment. NCR also provides an educational discount.

Monthly Charge*

	1-Year Lease	3-Year Lease	5-Year Lease	Purchase	Monthly Maint.
Model 796-101	$ 90	$ 85	$ 75	$2,000	$25
Model 796-301	168	160	145	3,500	28
Model 796-401	137	130	115	3,100	27
Model 796-501	155	145	130	3,750	24
Model 260-8 Serial Printer (for 796-101 only)	98	93	88	2,495	23
Model 260-9 Parallel Printer (for 796-301/-401/-501 only)	88	83	78	2,245	23
Model 6440-0202 Matrix Line Printer, 125 lpm	270	257	230	8,150	65
Model 6440-0302 Matrix Line Printer, 70 lpm	180	171	153	5,250	55
Model 6440-0402 Matrix Line Printer, 50 lpm	155	147	132	3,995	39
Printer interface (optional for 796-301 only)	8	8	7	185	—
Graphics feature (optional for 796-301 only)	10	10	9	230	—

*Includes maintenance.

QUANTITY AND EDUCATIONAL DISCOUNTS

	Quantity Discount Purchase Prices					Educational Discount*	
	1-10 Units	11-25 Units	26-50 Units	51-75 Units	75 & Over Units	Purchase	1-Year Lease
Model 796-101	$2,000	$1,840	$1,760	$1,720	$1,700	$1,900	$86
Model 796-301	3,500	3,220	3,080	3,010	2,975	3,325	160
Model 796-401	3,100	2,852	2,728	2,666	2,635	2,945	130
Model 796-501	3,750	3,450	3,300	3,225	3,188	3,563	147

*Any quantity of one or more units; 3- and 5-year leases are not discounted.■

NCR 796 Series Display Terminals

MANAGEMENT SUMMARY

NCR's 796 Series currently include four models of Teletype-compatible, stand-alone display terminals that range from the basic 796-101 to the more sophisticated 796-401. The terminals are purchased from Applied Digital Data Systems (ADDS) under OEM contracts dating back to September 1973. NCR had purchased an equity position in ADDS amounting to 7 percent of the companies common stock. The NCR 796 Series are the ADDS Consul series. Model 796-101 is the ADDS Consul 580, Model 796-201, the Consul 880; Model 796-301, the Consul 880A and the 796-401, the Consul 980. NCR is phasing out the 796-201 and replacing it with the 796-401, which is essentially an enhanced 201 with a few extra features including upper and lower case alphabetics and graphics as a standard feature. The graphics feature is optional on the -201 and -301. The 796-201 is now available on a limited basis. All models have the same physical appearance and are equipped with a 12-inch CRT and integral keyboard.

The salient features of the 796 Series include:

● Character, line, or page transmission.

● Switchable transmission rates from 110 bps to 9600 bps.

● 1920 character screen capacity.

● An addressable cursor.

● Individual cursor control keys. ▷

A low-cost family of Teletype-compatible stand-alone CRT keyboard/display terminals.

Standard features include switchable transmission rates up to 9600 bps, editing, format protection, full cursor control, cursor addressability, character or block transmission, upper and lower case alphabetics and graphics (optional on some models). A printer is optional.

Pricing ranges from $90 to $165 per month under a 1-year lease, including maintenance. Quantity discounts are available.

CHARACTERISTICS

VENDOR: NCR Corporation, Dayton, Ohio 45479. Telephone (513) 449-2150.

DATE OF ANNOUNCEMENT: Models 796-101, -201, and -301 — January 1973; Model 796-401 — September 1975.

DATE OF FIRST DELIVERY: Models 796-101, -201 and -301 — March 1973; Model 796-401 — November 1975.

NUMBER DELIVERED TO DATE: Over 5,000.

SERVICED BY: NCR.

MODELS

The NCR 796 series terminals currently include four stand-alone models with integral keyboards. They are Models 796-101, 796-201, 796-301, and 796-401. A printer ▶

An ADDS Consul model? Yes, with the NCR nameplate. A top-of-the-line model, the 796-301 has the same physical appearance as the rest of the models, but offers more features. Reverse video is the standard display technique for all models.

NCR 796 Series Display Terminals

▷ ● A numeric pad.

● Editing.

● Format protection.

● Graphics.

● Optional printed output (interface is standard).

● An RS-232C or current loop interface.

● 64 or 96 displayable symbols.

● An integral acoustic coupler.

● Polling.

Not all these features are combined in one model; however, each model includes many of them, and the features are distributed among models to satisfy both unsophisticated and sophisticated applications.

USER REACTION

In Datapro's 1976 survey of alphanumeric display terminal users, 6 users reported on their experience with 67 NCR 796 Series terminals. Their ratings are presented below.

	Excellent	Good	Fair	Poor	WA*
Overall performance	2	4	0	0	3.3
Ease of operation	2	4	0	0	3.3
Display clarity	2	4	0	0	3.3
Keyboard feel and usability	2	4	0	0	3.3
Hardware reliability	1	4	1	0	3.0
Maintenance	1	3	2	0	2.8
Software and technical support	0	4	2	0	2.7

* Weighted Average on a scale of 4.0 for Excellent.

These users cited low cost, flexibility, reliability, and strong vendor support as the key advantages. No significant disadvantages were mentioned.□

▶ interface is standard on Model 796-101 and optional on all other models. The interface accommodates an NCR Model 260-1 RO thermal printer.

TRANSMISSION SPECIFICATIONS

Transmission is asynchronous, half- and full-duplex for all models, and the 10- or 11-unit, 8-level ASCII transmission code is used. Each character transmitted includes a start bit; 7 data bits; a parity, mark, or space bit; and one or two (at 110 bps) stop bits. The eighth bits is switch-selectable for odd or even parity, mark ("1"), or space ("0"). Speed and interfacing parameters differ according to model.

● **Model 796-101** — When equipped with an RS 232C or CCITT V. 24 interface, speeds are selectable at 110, 1220, 2400, and 9600 bits/second. Other speeds can be specified. When equipped with a 20 ma dc current loop interface, speeds are switch selectable at 110, 300, 1200, 2400, and 9600 bits/second.

● **Model 796 - 201/-401** — Can be equipped with an RS-232C or 20 ma dc current loop interface. Model 796-201 can also be equipped with an acoustic coupler for operation at 110 or 300 bits/second in the originate mode only. Transmission speeds are switch-selectable at 110, 300, 1200, 1800, or 2400 bits/second with either the RS-232C or current loop interface.

● **Model 796-301** — Equipped with an RS-232C or CCITT V. 24 interface and provides switch-selectable speeds of 110, 300, 1200, 1800, and 2400 bits/second. Other speeds can be specified. Designed for multipoint or daisy-chained transmission.

DEVICE CONTROL

Model 796-101: Transmission is performed in a character-by-character basis only. Remote or keyed commands execute carriage return, line feed, screen erase, cursor control, keyboard lock/unlock functions, and printer control (on and off). Cursor functions include up, down, left, right, and home. A roll function causes data to roll by one line as a new line is keyed or received; data rolled off the screen is lost. An auto line feed function causes an automatic line feed for each carriage return. Printer controls provide on- and off-line (local) printing functions.

Model 796-201/-401: Provides three operating modes: Conversational, Message, and Page. Conversational mode transmits a character for each key depression. Message mode transmits a line at a time (up to 80 characters). Page mode transmits up to a full page of data (up to 1920 characters). The cursor is addressable and can be positioned to any location by remote command. Cursor controls include up, down, left, right, and home. Tab and screen erase functions are also provided. Format protection restricts data entry to unprotected fields; protected fields are displayed at half intensity. Only unprotected fields are transmitted. Edit controls include character insertion and deletion. Printer controls provide on- and off-line (local) printing functions.

Model 796-301: Provides two operating modes: Message and Page. Message mode transmits a line at a time (up to 80 characters). Page mode transmits up to a full page of data (1920 characters). The cursor is addressable and can be positioned to any location by remote command. Cursor controls include up, down, left, right, and home. Tab and screen erase functions are also provided. Format protection restricts data entry to unprotected fields, protected fields are displayed at half intensity. Only unprotected fields are transmitted. Edit controls include character insertion and deletion. Printer controls provide on -and off-line (local) printing functions.

COMPONENTS

CRT DISPLAY UNIT: A 12-inch (diagnal measurement) CRT with a viewing area 9 inches wide by 6 inches high. ▶

NCR 796 Series Display Terminals

► The display arrangement for all models is 24 lines of 80 characters each for a total screen capacity of 1920 characters. The standard character set is 64 displayable symbols that include upper-case alphabetics only for all models but the 796-401, which features 96 displayable symbols including upper and lower case alphabetics and numeric plus 32 special ASCII symbols. Each character is formed via a 5-by-7 dot matrix. Data is displayed in black (reverse video). A limited graphics feature is optional on Models 796-201 and -301 and standard on Model 796-401. The graphics feature displays graphic data via a matrix of 11,520 elements. The matrix arrangement is composed of 72 vertical by 160 horizontal dots.

MODEL 796-101 KEYBOARD: A 54-key typewriter-style attached keyboard. Key functions include Screen Erase, New Line, Break, Rub Out, Line Feed, Repeat, Escape, Space, Shift, and Control Shift. An 11-key numeric pad (including decimal point) and an 18-key cluster of 5 cursor and 2 printer control keys and 6 blank (undefined) keys are located to the right of the main keygroup. Roll, Auto Line Feed, and Full Duplex mode keys are located over the main keygroup. The keyboard can generate any of 128 ASCII character codes.

MODELS 796-201/-301/-401 KEYBOARD: A 54-key typewriter-style attached keyboard indentical with Model 796-101. Also includes an 11-key numeric pad and a 13-key cluster of function keys including 5 cursor, 2 printer, 2 tab (start and stop), 2 edit (insert and delete) and 2 format

(on and off) control keys. The Mode Control Keys are located over the main keyboard (Conversational/Message/Page, depending on model).

PRINTER: The NCR 260-1 printer is a non-impact printer that uses an electrothermal printing technique. Characters are formed within a 5-by-7 dot matrix; character size is 0.110 inch high by 0.082 inch wide.

The 260-1 prints any of 94 ASCII symbols, including upper and lower case alphabetics, numerics, and special characters, at 30 char/second. Lower case letters are printed as capitalized, half-size equivalents of the corresponding upper case letters.

Line length is 80 characters (8 inches). Horizontal and vertical spacing are 10 char/inch and 6 lines/inch, respectively. The printer has a friction-feed platen and accommodates a 100-foot or (optionally) 430-foot roll of 8.5-inch-wide NCR thermal paper, which fits inside the printer.

PRICING

The NCR 796 Series display terminals are available for purchase or lease, which includes full maintenance. Model 796-101 is available on a 1-, 3-, or 5-year lease; the other models are available on a 1-year lease only. A separate maintenance contract is available for purchased equipment. Quantity discounts are available for purchased equipment. NCR also provides an educational discount.

| | Monthly Charge* | | | | |
	1-Year Lease	3-Year Lease	5-Year Lease	Purchase	Monthly Maint.
Model 796-101	$ 90	$85	$75	$2,000	$25
Model 796-201	145	**	**	3,000	25
Model 796-301	165	**	**	3,500	25
Model 796-401	135	**	**	3,100	25
Model 260-1 Printer	100	85	75	1,595	17
Graphics feature	10	10	10	230	—

*Includes maintenance.
**Not available on a 3- or 5-year lease.

QUANTITY AND EDUCATIONAL PURCHASE DISCOUNTS

| | Purchase Prices | | | |
	1-5 Units	6-24 Units	25 & over Units	Educational Discounts
Model 796-101	$2,000	$1,720	$1,620	$1,620
Model 796-301	3,500	3,250	2,965	2,965
Model 796-401	3,100	2,790	2,550	2,550

*Any quantity of one or more units.■