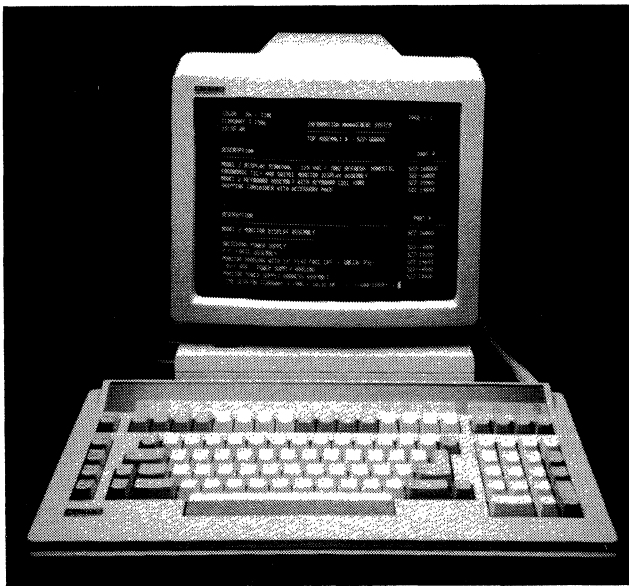# Applied Digital Data Systems (ADDS) Display Terminals

The new ADDS 2020 features a 14-inch, flat-face CRT display and is available in green, amber or smooth white phosphor. This model offers 26 lines, including top status and bottom label line. It is compatible with the ADDS Viewpoint A1/A2; Regents 40; TeleVideo 925, 920, and 910; Wyse 50; and Hazeltine 1500.

MANAGEMENT SUMMARY

UPDATE: Along with its Viewpoint Series of display terminals, Applied Digital Data Systems (ADDS) recently introduced the ADDS 2020 and ADDS 3220 terminals in July of this year. This report includes information on these two new models as well as the most recent changes to the Viewpoint line of display terminals.

Applied Digital Data Systems (ADDS) introduced the original Viewpoint display terminal in March 1981. This introduction proved to have a sharp impact on the ASCII terminal market. With a single-unit purchase price of $650 (currently $595), the Viewpoint was priced significantly lower than any comparable terminal on the market at that time. The ADDS introduction triggered a flurry of activity in the market, as competitors added new models or slashed prices on established models in response. The price war continues; today, prices at the low end have fallen to the $400 level, and some even below, with virtually all ASCII terminal vendors offering at least one model in that range.

Since the introduction of the original Viewpoint, ADDS has introduced several new models, creating the Viewpoint terminal family. The Viewpoint terminals replaced ADDS' highly successful Regent terminal line. In addition to conversational and smart terminals, ADDS has introduced low-priced color models and IBM-compatible models (when used in conjunction with a protocol converter). Also, ADDS became a wholly owned subsidiary of NCR in 1981.

The most recent additions to the ADDS terminal line are the ADDS 2020 and ADDS 3220, introduced in July of this ▷

ADDS is one of the traditional leaders in the general-purpose ASCII display terminal market. The Viewpoint Series remains one of the most successful product lines in that market; models in the series range from a basic conversational terminal to a smart color unit. ADDS has recently added a new line of terminals including the ADDS 2020 and, for the ANSI market, the ADDS 3220.

MODELS: The new product line consists of the ADDS 2020 and ADDS 3220. The Viewpoint models are the Viewpoint+, Viewpoint/Color, Viewpoint/60+, Viewpoint/78, Viewpoint/78 Color, Viewpoint/Color, Viewpoint/90, and Viewpoint/122.

DISPLAY: ADDS' new models feature flat-face, 14-inch displays; phosphors available are green, amber, and smooth white. The 2020 and 3220 offer a 24-line by 80 or 132-column format plus label and status lines. A 12-inch display with 24-line by 80-column arrangement is standard on all Viewpoint models.

KEYBOARD: All models feature a detachable, typewriter-style keyboard; the Viewpoint/78 and Viewpoint/78 Color feature an IBM 3278-style key arrangement; optional PC and/or PC/AT compatible keyboard offered with the ADDS 2020.

COMPETITION: Wyse, TeleVideo Systems, Lear Siegler, Esprit Systems, Visual Technology, ITT Qume, Liberty Electronics, and several others.

PRICE: Prices for the ADDS terminals range from $549 to $1,295.

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▷ year. Both terminals feature 14-inch, flat- face displays, 70 Hz refresh rates and 24-lines by 80 or 132-columns selectable formats. The ADDS 3220 is ADDS' second entry into the ANSI terminal competition.

Unveiled in August of 1985, the Viewpoint 122 is a Digital Equipment Corporation VT220-compatible terminal. This terminal features a 12-inch, tilt/swivel display, enhanced keyboard with 22 nonvolatile function keys, and bidirectional printer port. Included in the Viewpoint product line are the Viewpoint, Viewpoint+, and Viewpoint/60+. All of these terminals contain a new ergonomic enclosure. The Viewpoint is a redesigned version of the original Viewpoint, and the Viewpoint/60+ likewise replaced the older Viewpoint/60. The Viewpoint+ is an enhanced version of the Viewpoint that replaced three older models: the Viewpoint A1, A2, and 3A Plus.

All of the ADDS terminals provide a tiltable display and a detached keyboard, with a small footprint design; the Viewpoint+ and Viewpoint/60+ provide a display swivel capability. ADDS offers quantity discounts for end users and OEMs, as well as customized versions of the Viewpoint terminals for OEMs.

COMPETITIVE POSITION

Founded in 1969, Applied Digital Data Systems is a longtime leader in the ASCII terminal market. The company's initial product lines were the Consul, Envoy, and MRD Series; these were succeeded by the Regent Series, ADDS' first microprocessor-based terminals. The Viewpoint family replaced the Regent product line. International Data Corporation (IDC), located in Framingham, MA, places ADDS fourth in the CRT-based display market, and third as a producer of domestic ASCII terminals. 1984 shipments by ADDS totalled over 81,000 units. The top four vendors in this market continue to be Wyse Technology, TeleVideo, ADDS, and Esprit Systems. However, several newcomers are threatening to break into this elite group. Visual Technology, ITT Qume, and Liberty Electronics have all carved out a healthy market share in the past several months. ADDS new product introductions are no doubt designed to protect the company's market share from these upstarts.

ADVANTAGES AND RESTRICTIONS

Until recently, ADDS manufactured its complete products in the U.S. However, with the reduction in labor costs made necessary by the increase in competition, ADDS has followed the lead of several other terminal vendors and negotiated for offshore assembly.

In 1981, ADDS was acquired by NCR Corporation. Then its number-one customer, ADDS has been considerably strengthened by the backing of the computer giant. It is, in fact, the only one of the top four vendors in the ASCII market with this type of backing (ITT Qume, one of the challengers, is owned by communications giant ITT). Like TeleVideo, ADDS has also entered the microcomputer market. ▷

▶ **MODELS**

Applied Digital Data Systems (ADDS) offers two distinct families of display terminals: the ADDS Series and the Viewpoint Series. The ADDS series consists of the ADDS 2020 and 3220, and the Viewpoint Series of general-purpose alphanumeric terminals which currently consists of eight models. All of ADDS' displays are standalone ASCII units that include a display and keyboard.

- **ADDS 2020**—a smart terminal featuring a 14-inch, flat-face screen, etched for reduced glare. A programmable menu system is offered as well as pop-up window system which provides off-line display of text windows on the monitor under application and operator control.

- **ADDS 3220**— an ANSI X3.64 terminal available in green, amber, or smooth white phospher. Compatible with the ADDS 122 and Digital VT220, VT100, and VT52.

The Viewpoint Series consists of:

- **Viewpoint**—a basic conversational terminal. The original member of the Viewpoint Series, the Viewpoint was enhanced in July 1984 with a new ergonomic enclosure and a lower price.

- **Viewpoint+**—a version of the Viewpoint that provides emulation of three older Viewpoint models: A1, A2, and 3A+.

- **Viewpoint/Color**—a smart terminal with eight-color (red, green, blue, yellow, magenta, cyan, black, and white) display capability. Editing features, business graphics, and eight function keys are also standard.

- **Viewpoint/60+**—a smart terminal which includes editing features, business graphics, and eight function keys. The Viewpoint/60+ is an enhanced version of the Viewpoint/ 60.

- **Viewpoint/78**—a conversational terminal that provides IBM 3278 emulation when used in conjunction with a protocol converter. The terminal's keyboard contains a key layout identical to that of an IBM 3278 Model 2, including 24 function keys.

- **Viewpoint/78 Color**—a color version of the Viewpoint/78.

- **Viewpoint/90**—a smart terminal which includes editing features, business graphics, 15 function keys, and one page of display memory, with a second page optional.

- **Viewpoint 122**—an ANSI terminal which features a 12-inch display unit available with green phospher (amber optional). The detachable, low-profile keyboard offers two-position tilt and 22 programmable function keys with tactile feedback.

TRANSMISSION SPECIFICATIONS

Transmission is asynchronous, in half- or full-duplex modes, at speeds from 110 to 19,200 bits per second. An RS-232-C interface is standard, as is an auxiliary serial output interface. RS-422 and 20 ma current loop interfaces are optional. Odd, even, mark, or space parity is selectable.

DEVICE CONTROL

The ADDS 2020 and ADDS 3220 transmit data character by character as it is keyed. Cursor controls move the cursor up, down, right, left, and home. The cursors appear as blinking, nonblinking, or steady block or underline, as selected by the user. Visual attributes include normal, reverse, blink, underline, half intensity, or zero intensity; bold is also offerred on the ADDS 3220. ▶

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➤ USER REACTION

In the 1985 Terminal Users' Survey, conducted by Datapro in conjunction with *Data Communications* magazine, a total of 51 responses was received from users of ADDS Viewpoint Series terminals. These users represented an installed base of 2,500 terminals. Broken down by model, 15 of the users reported on the Viewpoint, 3 on the Viewpoint/90, 10 on the Viewpoint/60, and 5 on the Viewpoint A2. Older models are included. The users were asked to rate their terminals in several categories. Their ratings are summarized in the following table.

	Excellent	Good	Fair	Poor	WA*
Overall performance	10	33	8	0	3.0
Ease of operation	12	31	8	0	3.1
Display clarity	10	32	7	0	3.0
Keyboard feel & usability	11	29	6	5	2.9
Ergonomics	5	11	18	15	2.1
Hardware reliability	16	27	7	1	3.1
Maintenance service/ technical support	8	23	10	5	2.7

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

The users were also asked whether or not they would recommend the Viewpoint terminals to other users. Of the 51 respondents, 31 answered that they would; 11 stated that they would not, while the remaining 8 were undecided. □

➤ Editing features available on the ADDS 2020 and ADDS 3220 include insert/delete character and insert/delete line. The ADDS 2020 includes 16 programmable function keys, shiftable to 32 and 28 programmable editing keys, shiftable to 56. The ADDS 3220 includes 22 programmable function keys which are host and/or user programmable and available in all modes.

On the ADDS 2020, 88 programmable key modes are supported by 3K characters of nonvolatile RAM. One page of memory is offerred on the ADDS 3220.

The Viewpoint 122 can transmit data character by character as it is keyed. The block or underline cursor appears as blinking, steady visible, or invisible. Video attributes include normal video plus any combination of blink, bold, underline, or reverse video. This unit permits four independent speeds of smooth scroll selectable through setup display or keyboard control.

The Viewpoint, Viewpoint+, Viewpoint/78, and Viewpoint/78 Color transmit data character by character as it is keyed. Cursor controls move the cursor up, down, left, right, and home. The cursor appears as a blinking or nonblinking block or underline, as selected by the user via a switch. The cursor is addressable. Video attributes include normal video plus a choice of one visual effect per screen: either blinking, underline, reverse video, half intensity, or zero intensity.

The Viewpoint/Color, Viewpoint/60+, and Viewpoint/90 can transmit character by character, by partial or full line, or by page. The cursor can be selected to appear as a blinking or nonblinking block or underline, and it can also be selected to be invisible. Visual attributes available on the Viewpoint/60+ and Viewpoint/90 include full/half/zero intensity, blink, underline, and reverse video, which can be used in any combination. Visual attributes available on the Viewpoint/Color include zero intensity, blink, and reverse video.

Edit features available on the Viewpoint/Color, Viewpoint/60+ and Viewpoint/90 include insert/delete character and insert/delete line. The Viewpoint/60+ includes 8 function keys which can be user-programmed to perform 16 discrete programmed functions. The Viewpoint/Color has 8 preprogrammed function keys, shiftable to 16 functions. The Viewpoint/90 provides 15 function keys with 256 total characters allocated to 30 codes.

The Viewpoint/Color has two pages of memory standard. The Viewpoint/60+ supports a second page optionally, allowing either independent pages or a single 48-line page. On the Viewpoint/90, a second page of memory can be optionally added for use as a display background print buffer, an extra I/O buffer, or additional customer program memory. With the second page, data can be scrolled up or down between pages. Lines or areas on the screen can be designated as locked, in which case the unlocked area can be scrolled independently of the locked area.

The Viewpoint/78 and Viewpoint/78 Color can access IBM 3270 applications on an IBM mainframe when used in conjunction with an appropriate protocol converter. The Viewpoint/78 and Viewpoint/78 Color provide functional emulation of the IBM 3278 Display Station.

Operating parameters on the Viewpoint Series terminal are selected via the terminal's keyboard, from a menu displayed on the screen.

COMPONENTS

ADDS CRT DISPLAY UNITS: The ADDS 2020 and ADDS 3220 include 14-inch, flat-face display screens, etched for reduced glare. The displays feature 24-line by 80 or 132-character formats (40 or 66 with double wide characters) and are available in green, amber, or smooth white phospher. A top status line and bottom label line are included on the ADDS 2020.

VIEWPOINT SERIES CRT DISPLAY UNITS: The Viewpoint, Viewpoint+, Viewpoint/60+, Viewpoint/78, Viewpoint/90 and Viewpoint 122 all include a 12-inch (diagonally measured), nonglare display screen. The Viewpoint/Color and Viewpoint/78 Color feature a 13-inch display. The standard display capacity is 1,920 characters for all models, arranged in a 24-line by 80-character format. In the 132-column format on the Viewpoint 122, there is a 3,168 character screen capacity. A 25th display line for the display of status information is available on all models except the Viewpoint and Viewpoint+. A variable display tilt adjustment is standard on all models; a display swivel capability is standard on all models except the Viewpoint.

White (P4) or green (P31) phosphor characters can be selected on all monochrome models. The Viewpoint/Color and Viewpoint/78 Color can assign eight available colors (red, blue, green, yellow, magenta, cyan, black, and white, in P22 phosphor) as desired by the operator. Characters are formed utilizing a 5-by-7 dot matrix on the Viewpoint, Viewpoint+, and Viewpoint/Color, via a 7-by-8 dot matrix on the Viewpoint/90, Viewpoint/78, and Viewpoint/78 Color, and via a 7-by-9 dot matrix on the Viewpoint/60+. Characters on the Viewpoint 122 are formed via a 10-by-10 dot matrix for 80 columns and 9-by-10 dot matrix for 132 columns. The 128-character ASCII set is displayable on all models.

A fine-line business graphics capability is standard on the Viewpoint/60+ and Viewpoint/Color. Fine-line and element business graphics are standard on the Viewpoint/90. The following international character sets are available: Belgium, Denmark, Finland, France, Germany, Norway, Spain, Sweden, Switzerland, and United Kingdom. ➤

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► ADDS KEYBOARDS: The ADDS 3220 contains a 112 key keyboard which is VT220-compatible with seven additional function keys. Twenty-two host and/or user programmable keys are available in all modes. Smooth scroll speed may be selected from the keyboard.

The ADDS 2020 features 88 programmable key modes supported by 3K characters of nonvolatile RAM. This unit includes 16 programmable function keys, shiftable to 32 and 28 programmable editing keys, shiftable to 56.

VIEWPOINT SERIES KEYBOARDS: All models include a detachable, low-profile keyboard. Except for the Viewpoint/78, all of the keyboards feature a typewriter-style layout with a separate numeric pad. The Viewpoint/78 and Viewpoint/78 Color feature a key layout that emulates the keyboard found on the IBM 3278 Display Station Model 2. All keyboards are stepped, contain sculptured keycaps, and feature a nonglare finish. Typamatic keys are also standard on all models.

The Viewpoint and Viewpoint+ contain 72 keys, including a 58-key main array, and a 14-key array with numeric entry keys, cursor controls, and three function keys.

The Viewpoint/60+ and Viewpoint/Color contain 78 keys, including a 56-key main array, 14 numeric entry keys, and 8 function keys. Tactile feedback is standard.

The Viewpoint/78 and Viewpoint/78 Color contain 85 keys, divided into an alphanumeric cluster, function key cluster, and editing and mode clusters. Twenty-four program function keys and two program attention keys are included.

The Viewpoint/90 contains 89 keys, including a 56-key main array, an 18-key numeric entry pad, and 15 function keys. Tactile feedback is standard. Also included are three

unpopulated key positions, with unique codes defined in nonvolatile memory.

The Viewpoint 122 contains 112 keys, 22 of which are programmable function keys, an ESC key, and compose character key. Also included are separate editing and cursor keypad and separate numeric keypad.

When ordered with optional foreign-compatible power supplies, the Viewpoint and Viewpoint+ include the appropriate foreign key caps. Other models feature optional kits for foreign languages.

PRICING

All Viewpoint terminals are available for purchase only. Quantity discounts are available for OEMs and end users. The following purchase prices are single-quantity, end-user prices. Contact ADDS for OEM pricing.

	Purchase Price ($)
ADDS 2020	*
ADDS 3220	*
Viewpoint	549
Viewpoint+	595
Viewpoint Color	1,295
Viewpoint 60+	749
Viewpoint 78	1,095
Viewpt 78 Color	1,595
Viewpoint 90	1,195
Viewpoint 122	699

*Prices unavailable. ∎

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The new Viewpoint + replaces three older Viewpoint versions: the A1, A2, and 3A Plus. The Viewpoint + features ADDS' new ergonomic enclosure design, including a 12-inch tilt/swivel display and a low-profile keyboard.

MANAGEMENT SUMMARY

Applied Digital Data Systems (ADDS) introduced the original Viewpoint display terminal in March 1981. This introduction proved to have a sharp impact on the ASCII terminal market. With a single-unit purchase price of $650, the Viewpoint was priced significantly lower than any comparable terminal on the market at that time. The ADDS introduction triggered a flurry of activity in the market, as competitors added new models or slashed prices on established models in response. The price war continues; today, prices at the low end have fallen to the $500 level, with virtually all ASCII terminal vendors offering at least one model in that range.

Since the introduction of the original Viewpoint, ADDS has introduced several new models, creating the Viewpoint terminal family. The Viewpoint terminals replaced ADDS' highly successful Regent terminal line. In addition to conversational and smart terminals, ADDS has introduced a low-priced color model, and IBM-compatible models (when used in conjunction with a protocol converter). Also, ADDS became a wholly owned subsidiary of NCR in 1981.

Recently, ADDS has made several changes to the Viewpoint product line. At the 1984 National Computer Confer- ▷

ADDS is one of the traditional leaders in the general-purpose ASCII display terminal market. The Viewpoint Series is currently one of the most successful product lines in that market; models in the series range from a basic conversational terminal to a smart color unit. ADDS has recently enhanced the Viewpoint line with new and redesigned models. In addition, the company has brought to market a family of graphics terminals, called the X Series.

MODELS: The Viewpoint product line consists of the Viewpoint, Viewpoint +, Viewpoint/Color, Viewpoint/60 +, Viewpoint/78, Viewpoint/78 Color, Viewpoint/90, and Viewpoint/925+. The X Series consists of the ADDS/XK1, ADDS/XK19, and ADDS/X5A.

DISPLAY: A variety of display sizes is available, ranging from 12 inches for most Viewpoint models to 19 inches for the XK19. The Viewpoint/Color, Viewpoint/78 Color, and ADDS/X5A feature color displays; all other models feature monochrome displays with green or black and white phosphor. (Amber and smooth white are optionally available.) The standard display arrangement for all models is 24 lines by 80 columns.

KEYBOARD: All models feature a detachable, typewriter-style keyboard; the Viewpoint/78 and Viewpoint/78 Color feature an IBM 3278-style key arrangement.

COMPETITION: TeleVideo Systems, Lear Siegler, Esprit Systems, Visual Technology, Qume, Liberty Electronics, and several others.

PRICE: Prices for the Viewpoint terminals range from $549 to $1,995. Prices for the X Series terminals range from $3,295 to $4,495.

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▷ ence in Las Vegas, ADDS debuted the Viewpoint, Viewpoint +, Viewpoint/60+, and Viewpoint/925+. All of these new terminals contain a new ergonomic enclosure. The Viewpoint is a redesigned version of the original Viewpoint, and the Viewpoint/60+ likewise replaces the older Viewpoint/60. The Viewpoint + is an enhanced version of the Viewpoint that replaces three older models: the Viewpoint A1, A2, and 3A Plus. The Viewpoint/925+ is a new model that provides emulation of the TeleVideo 925. The terminal is a version of the Epic 14E, which ADDS acquired from Epic Computer Products in 1983.

At the 1984 SIGGRAPH show in Minneapolis, ADDS unveiled the X Series of graphics terminals. The X Series consists of ADDS' versions of U.K.-based Datatype's AutoGraph X Series of graphics terminals; ADDS purchased the U.S. manufacturing and marketing rights to the AutoGraph product line in February 1984. Three models were introduced by ADDS: the ADDS/XK1, ADDS/XK19, and ADDS/X5A. All models provide both alphanumeric and graphics capabilities, with Tektronix 4014 graphics terminal emulation, along with DEC VT100 or TeleVideo 925 alphanumeric terminal compatibility. The ADDS/XK1 and ADDS/XK19 are monochrome terminals with 14- and 19-inch displays, respectively. The ADDS/X5A is a color terminal with a 13-inch display.

All of the ADDS terminals provide a tiltable display and a detached keyboard, with a small footprint design; the new Viewpoint +, Viewpoint/60+, and Viewpoint 925+ also provide a display swivel capability. ADDS offers quantity discounts for end users and OEMs, as well as customized versions of the Viewpoint terminals for OEMs.

COMPETITIVE POSITION

Founded in 1969, Applied Digital Data Systems is a long-time leader in the ASCII terminal market. The company's initial product lines were the Consul, Envoy, and MRD series; these were succeeded by the Regent Series, ADDS' first microprocessor-based terminals. The current Viewpoint family replaced the Regent product line. Market research firm Dataquest (San Diego, CA) places ADDS second in terminal shipments to industry leader TeleVideo Systems; 1983 shipments by ADDS' totalled over 100,000 units. The top four vendors in this market continue to be TeleVideo, ADDS, Lear Siegler, and Esprit Systems. However, several newcomers are threatening to break into this elite group. Visual Technology, Qume, Liberty Electronics, and Wyse Technology have all carved out a healthy market share in the past several months. ADDS new product introductions are no doubt designed to protect the company's market share from these upstarts.

ADVANTAGES AND RESTRICTIONS

ADDS' marketing strategy, as stated by Director of Marketing Joseph Maronna in an interview that appeared in Electronic News (October 3, 1983), is *not* to become the price leader in the ASCII terminal market. ADDS' main objective, stated Mr. Maronna, ". . . is to provide a suitable product based on market demands, and to be able to do that at sufficient margins for our distributors and our company." The company has obviously found this to be a ▷

▶ DATE OF FIRST DELIVERY: Viewpoint—April 1981; Viewpoint/90—First Quarter 1982; Viewpoint/78—January 1983; Viewpoint/Color—May 1983; Viewpoint/78 Color—May 1983; Viewpoint (enhanced version), Viewpoint +, Viewpoint/60 +, and Viewpoint/925+—August 1984; ADDS/XK1, ADDS/XK19, and ADDS/X5A—fourth quarter 1984 (anticipated).

NUMBER DELIVERED TO DATE: Over 500,000 (all models).

SERVICED BY: ADDS, NCR, TRW, General Electric.

MODELS

Applied Digital Data Systems (ADDS) offers two distinct families of display terminals: the Viewpoint Series and the X Series. The Viewpoint Series of general-purpose alphanumeric terminals currently consists of eight models; the X Series of graphics terminals contains three models. All of ADDS' displays are stand-alone ASCII units that include a display and keyboard.

The Viewpoint Series consists of:

• Viewpoint—a basic conversational terminal. The original member of the Viewpoint Series, the Viewpoint was enhanced in July 1984 with a new ergonomic enclosure and a lower price.

• Viewpoint +—a version of the Viewpoint that provides emulation of three older Viewpoint models: A1, A2, and 3A+.

• Viewpoint/Color—a smart terminal with eight-color (red, green, blue, yellow, magenta, cyan, black, and white) display capability. Editing features, business graphics, and eight function keys are also standard.

• Viewpoint/60+—a smart terminal which includes editing features, business graphics, and eight function keys. The Viewpoint/60+ is an enhanced version of the Viewpoint/60.

• Viewpoint/78—a conversational terminal that provides IBM 3278 emulation when used in conjunction with a protocol converter. The terminal's keyboard contains a key layout identical to that of an IBM 3278 Model 2, including 24 function keys.

• Viewpoint/78 Color—a color version of the Viewpoint/78.

• Viewpoint/90—a smart terminal which includes editing features, business graphics, 15 function keys, and one page of display memory, with a second page optional.

• Viewpoint/925+—a smart terminal that offers TeleVideo 925 emulation

The X Series consists of:

• ADDS/XK1—provides graphics capabilities (Tektronix 4010 emulation) plus alphanumeric capabilities (DEC VT100 and TeleVideo 925 compatibility). The ADDS/XK1 features a 14-inch monochrome display with a 1024-by-1024 pixel resolution.

• ADDS/XK19—provides all of the features of the ADDS/XK1, with a 19-inch monochrome display.

• ADDS/X5A—provides all of the features of the ADDS/XK1, with a 13-inch color display. ▶

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▷ successful strategy, attested to by their strong position in this fiercely competitive market. ADDS' recent product introductions serve to broaden the product line and strengthen that position. The X Series puts ADDS in the graphics terminal market for the first time.

ADDS' manufacturing strategy has, up until recently, also been somewhat different from that of the other players in the ASCII market. The company had been one of the few to continue the manufacturing of complete products in the U.S. The reduction in labor costs made necessary by the current price war has driven most vendors to off-shore manufacturing sources, at least for the production of components if not the complete unit. ADDS had been manufacturing subassemblies at a dedicated plant in Draper, Utah, with final assembly at the company's main plant in New York; however, the company has recently closed the plant and is looking to move off-shore for subassembly manufacturing. The move seems to indicate that some off-shore manufacturing is now almost mandatory for survival in this market.

Another strategy unique to ADDS seems to be the acquisition of needed products from outside sources. The purchase of the AutoGraph X Series of graphics terminals from Datatype has provided ADDS with an established graphics product line. In order to enter the ANSI X3.64-compatible terminal market, ADDS acquired the rights to the Epic 14E product line from floundering Epic Computer Products. The X Series and Viewpoint/925+ will result from these acquisitions.

In 1981, ADDS was itself acquired by NCR Corporation. Then its number-one customer, ADDS has been considerably strengthened by the backing of the computer giant. It is, in fact, the only one of the top four vendors in the ASCII market with this type of backing (Qume, one of the challengers, is owned by communications giant ITT). Like TeleVideo, ADDS has recently entered the microcomputer market.

USER REACTION

In the 1983 Terminal Users' Survey, conducted by Datapro in conjunction with *Data Communications* magazine, a total of 23 responses was received from users of ADDS Viewpoint Series terminals. These users represented an installed base of 634 terminals. Broken down by model, 13 of the users reported on the Viewpoint, 5 on the Viewpoint/90, 2 on the Viewpoint/60, 2 on the Viewpoint A2, and 1 on the Viewpoint/3A Plus. The users were asked to rate their terminals in several categories. Their ratings are summarized in the following table.

	Excellent	Good	Fair	Poor	WA*
Overall performance	12	10	1	0	3.5
Ease of operation	4	16	2	0	3.1
Display clarity	3	18	2	0	3.0
Keyboard feel & usability	4	15	4	0	3.0
Ergonomics	5	13	4	0	3.0
Hardware reliability	4	12	7	0	2.9
Maintenance service/ technical support	6	11	3	2	3.0

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

▶ **TRANSMISSION SPECIFICATIONS**

Transmission is asynchronous, in half- or full-duplex modes, at speeds from 110 to 19,200 bits per second. An RS-232-C interface is standard, as is an auxiliary serial output interface. RS-422 and 20 ma current loop interfaces are optional. Odd, even, mark, or space parity is selectable.

DEVICE CONTROL

The Viewpoint, Viewpoint +, Viewpoint/78, and Viewpoint/78 Color transmit data character-by-character as it is keyed. Cursor controls move the cursor up, down, left, right, and home. The cursor appears as a blinking or nonblinking block or underline, as selected by the user via a switch. The cursor is addressable. Video attributes include normal video plus a choice of one visual effect per screen: either blinking, underline, reverse video, half intensity, or zero intensity.

The Viewpoint/Color, Viewpoint/60+, Viewpoint/90, and Viewpoint/925+ can transmit character-by-character, by partial or full line, or by page. The cursor can be selected to appear as a blinking or nonblinking block or underline, and it can also be selected to be invisible. Visual attributes available on the Viewpoint/60+, Viewpoint/90, and Viewpoint/925+ include: full/half/zero intensity, blink, underline, and reverse video which can be used in any combination. Visual attributes available on the Viewpoint/Color include: zero intensity, blink, and reverse video.

Edit features available on the Viewpoint/Color, Viewpoint/60+, Viewpoint/90, and Viewpoint/925+ include insert/delete character and insert/delete line. The Viewpoint/60+ includes 8 function keys which can be user-programmed to perform 16 discrete programmed functions. The Viewpoint/Color has 8 preprogrammed function keys, shiftable to 16 functions. The Viewpoint/90 provides 15 function keys with 256 total characters allocated to 30 codes.

The Viewpoint/Color has two pages of memory standard. The Viewpoint/60+ supports a second page optionally, allowing either independant pages or a single 48-line page. On the Viewpoint/90, a second page of memory can be optionally added for use as a display background print buffer, an extra I/O buffer, or additional customer program memory. With the second page, data can be scrolled up or down between pages. Lines or areas on the screen can be designated as locked, in which case the unlocked area can be scrolled independently of the locked area.

The Viewpoint/78 and Viewpoint/78 Color can access IBM 3270 applications on an IBM mainframe when used in conjunction with an appropriate protocol converter. The Viewpoint/78 and Viewpoint/78 Color provide functional emulation of the IBM 3278 Display Station.

Operating parameters on the Viewpoint Series terminal are selected via the terminal's keyboard, from a menu displayed on the screen.

The X Series terminals provide both graphics and alphanumeric capabilities. For graphics applications, the X Series terminals provide Tektronix 4014 graphics terminal emulation and support Tektronix Plot 10 graphics software. For alphanumeric applications, the X Series terminals provide DEC VT100 and TeleVideo 925 compatibility for smart terminal operation. Separate memory planes are available for graphics and alphanumerics. The terminals are based on a Motorola 68000 microprocessor, and provide support for a variety of optional peripheral devices, including digitizers and joysticks. Graphics capabilities supported include zoom, pan, scroll, and draw. ▶

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▷ The users were also asked whether or not they would recommend the Viewpoint terminals to other users. Of the 23 respondents, 18 answered that they would; only 2 stated that they would not, while the remaining 3 were undecided. □

▶ COMPONENTS

VIEWPOINT SERIES CRT DISPLAY UNITS: The Viewpoint, Viewpoint +, Viewpoint/60+, Viewpoint/78, and Viewpoint/90 all include a 12-inch (diagonally measured) nonglare display screen. The Viewpoint/Color and Viewpoint/78 Color feature a 13-inch display, while the Viewpoint/925+ includes a 14-inch display. The standard display capacity is 1920 characters for all models, arranged in a 24-line by 80-character format. A 25th display line for the display of status information is available on all models except the Viewpoint and Viewpoint+. A variable display tilt adjustment is standard on all models; a display swivel capability is standard on all models except the Viewpoint.

White (P4) or green (P31) phosphor characters can be selected on all monochrome models (green only on the Viewpoint/925+). The Viewpoint/Color and Viewpoint/78 Color can assign eight available colors (red, blue, green, yellow, magenta, cyan, black, and white, in P22 phosphor) as desired by the operator. Characters are formed utilizing a 5-by-7 dot matrix on the Viewpoint, Viewpoint +, and Viewpoint/Color, via a 7-by-8 dot matrix on the Viewpoint/90, Viewpoint/78, and Viewpoint/78 Color, and via a 7-by-9 dot matrix on the Viewpoint/60+ and Viewpoint/925+. The 128-character ASCII set is displayable on all models.

A fine-line business graphics capability is standard on the Viewpoint/60+ and Viewpoint/Color. Fine-line and element business graphics are standard on the Viewpoint/90. The following international character sets are available: Belgium, Denmark, Finland, France, Germany, Norway, Spain, Sweden, Switzerland, and United Kingdom.

X SERIES CRT DISPLAY UNITS: The ADDS/XK1 includes a 14-inch (diagonally measured) monochrome display screen; the ADDS/XK19 features a 19-inch display screen. Both models have a display resolution of 1024 by 1024 pixels with a 1024-by-780 pixel viewing window. The ADDS/X5A includes a 13-inch color display screen with a 512-by-512 pixel color presentation and a 512-by-390 pixel viewing window. Up to 16 colors may be displayed simultaneously, from a user-defined palette providing 4096 possible colors. All models except the ADDS/XK19 feature a tilt/swivel display capability.

VIEWPOINT SERIES KEYBOARDS: All models include a detachable, low-profile keyboard. Except for the View-

point/78, all of the keyboards feature a typewriter-style layout with a separate numeric pad. The Viewpoint/78 and Viewpoint/78 Color feature a key layout that emulates the keyboard found on the IBM 3278 Display Station Model 2. All keyboards are stepped, contain sculptured keycaps, and feature a nonglare finish. Typamatic keys are also standard on all models.

The Viewpoint and Viewpoint + contain 72 keys, including a 58-key main array, and a 14-key array with numeric entry keys, cursor controls, and three function keys.

The Viewpoint/60+ and Viewpoint/Color contain 78 keys, including a 56-key main array, 14 numeric entry keys, and 8 function keys. Tactile feedback is standard.

The Viewpoint/78 and Viewpoint/78 Color contain 85 keys, divided into an alphanumeric cluster, function key cluster, and editing and mode clusters. Twenty-four program function keys and two program attention keys are included.

The Viewpoint/90 contains 89 keys, including a 56-key main array, an 18-key numeric entry pad, and 15 function keys. Tactile feedback is standard. Also included are three unpopulated key positions, with unique codes defined in nonvolatile memory.

When ordered with optional foreign-compatible power supplies, the Viewpoint and Viewpoint+ include the appropriate foreign key caps. Other models feature optional kits for foreign languages.

X SERIES KEYBOARDS: All models include a detachable, low-profile keyboard. A typewriter-style key layout with a separate numeric pad is standard. A joystick is included for graphics applications.

PRICING

All Viewpoint and X Series terminals are available for purchase only. Quantity discounts are available for OEMs and end users. The following purchase prices are single-quantity end-user prices. Contact ADDS for OEM pricing.

Model	Purchase Price ($)
Viewpoint	549
Viewpoint +	595
Viewpoint/Color	1,295
Viewpoint/60 +	749
Viewpoint/78	1,095
Viewpoint/78 Color	1,595
Viewpoint/90	1,195
Viewpoint/925+	749
ADDS/XK1	3,295
ADDS/XK19	4,495
ADDS/X5A	3,595 ■

Applied Digital Data Systems (ADDS) Display Terminals

The new Viewpoint + replaces three older Viewpoint versions: the A1, A2, and 3A Plus. The Viewpoint + features ADDS' new ergonomic enclosure design, including a 12-inch tilt/swivel display and a low-profile keyboard.

MANAGEMENT SUMMARY

Applied Digital Data Systems (ADDS) introduced the original Viewpoint display terminal in March 1981. This introduction proved to have a sharp impact on the ASCII terminal market. With a single-unit purchase price of $650, the Viewpoint was priced significantly lower than any comparable terminal on the market at that time. The ADDS introduction triggered a flurry of activity in the market, as competitors added new models or slashed prices on established models in response. The price war continues; today, prices at the low end have fallen to the $500 level, with virtually all ASCII terminal vendors offering at least one model in that range.

Since the introduction of the original Viewpoint, ADDS has introduced several new models, creating the Viewpoint terminal family. The Viewpoint terminals replaced ADDS' highly successful Regent terminal line. In addition to conversational and smart terminals, ADDS has introduced a low-priced color model, and IBM-compatible models (when used in conjunction with a protocol converter). Also, ADDS became a wholly owned subsidiary of NCR in 1981.

Recently, ADDS has made several changes to the Viewpoint product line. At the 1984 National Computer Confer- ▷

ADDS is one of the traditional leaders in the general-purpose ASCII display terminal market. The Viewpoint Series is currently one of the most successful product lines in that market; models in the series range from a basic conversational terminal to a smart color unit. ADDS has recently enhanced the Viewpoint line with new and redesigned models. In addition, the company has brought to market a family of graphics terminals, called the X Series.

MODELS: The Viewpoint product line consists of the Viewpoint, Viewpoint +, Viewpoint/Color, Viewpoint/60 +, Viewpoint/78, Viewpoint/78 Color, Viewpoint/90, and Viewpoint/925+. The X Series consists of the ADDS/XK1, ADDS/XK19, and ADDS/X5A.

DISPLAY: A variety of display sizes is available, ranging from 12 inches for most Viewpoint models to 19 inches for the XK19. The Viewpoint/Color, Viewpoint/78 Color, and ADDS/X5A feature color displays; all other models feature monochrome displays with green or black and white phosphor. (Amber and smooth white are optionally available.) The standard display arrangement for all models is 24 lines by 80 columns.

KEYBOARD: All models feature a detachable, typewriter-style keyboard; the Viewpoint/78 and Viewpoint/78 Color feature an IBM 3278-style key arrangement.

COMPETITION: TeleVideo Systems, Lear Siegler, Esprit Systems, Visual Technology, Qume, Liberty Electronics, and several others.

PRICE: Prices for the Viewpoint terminals range from $549 to $1,995. Prices for the X Series terminals range from $3,295 to $4,495.

CHARACTERISTICS

Applied Digital Data Systems
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▷ ence in Las Vegas, ADDS debuted the Viewpoint, Viewpoint +, Viewpoint/60+, and Viewpoint/925+. All of these new terminals contain a new ergonomic enclosure. The Viewpoint is a redesigned version of the original Viewpoint, and the Viewpoint/60+ likewise replaces the older Viewpoint/60. The Viewpoint + is an enhanced version of the Viewpoint that replaces three older models: the Viewpoint A1, A2, and 3A Plus. The Viewpoint/925+ is a new model that provides emulation of the TeleVideo 925. The terminal is a version of the Epic 14E, which ADDS acquired from Epic Computer Products in 1983.

At the 1984 SIGGRAPH show in Minneapolis, ADDS unveiled the X Series of graphics terminals. The X Series consists of ADDS' versions of U.K.-based Datatype's AutoGraph X Series of graphics terminals; ADDS purchased the U.S. manufacturing and marketing rights to the AutoGraph product line in February 1984. Three models were introduced by ADDS: the ADDS/XK1, ADDS/XK19, and ADDS/X5A. All models provide both alphanumeric and graphics capabilities, with Tektronix 4014 graphics terminal emulation, along with DEC VT100 or TeleVideo 925 alphanumeric terminal compatibility. The ADDS/XK1 and ADDS/XK19 are monochrome terminals with 14- and 19-inch displays, respectively. The ADDS/X5A is a color terminal with a 13-inch display.

All of the ADDS terminals provide a tiltable display and a detached keyboard, with a small footprint design; the new Viewpoint +, Viewpoint/60+, and Viewpoint 925+ also provide a display swivel capability. ADDS offers quantity discounts for end users and OEMs, as well as customized versions of the Viewpoint terminals for OEMs.

COMPETITIVE POSITION

Founded in 1969, Applied Digital Data Systems is a long-time leader in the ASCII terminal market. The company's initial product lines were the Consul, Envoy, and MRD series; these were succeeded by the Regent Series, ADDS' first microprocessor-based terminals. The current Viewpoint family replaced the Regent product line. Market research firm Dataquest (San Diego, CA) places ADDS second in terminal shipments to industry leader TeleVideo Systems; 1983 shipments by ADDS' totalled over 100,000 units. The top four vendors in this market continue to be TeleVideo, ADDS, Lear Siegler, and Esprit Systems. However, several newcomers are threatening to break into this elite group. Visual Technology, Qume, Liberty Electronics, and Wyse Technology have all carved out a healthy market share in the past several months. ADDS new product introductions are no doubt designed to protect the company's market share from these upstarts.

ADVANTAGES AND RESTRICTIONS

ADDS' marketing strategy, as stated by Director of Marketing Joseph Maronna in an interview that appeared in Electronic News (October 3, 1983), is *not* to become the price leader in the ASCII terminal market. ADDS' main objective, stated Mr. Maronna, "... is to provide a suitable product based on market demands, and to be able to do that at sufficient margins for our distributors and our company." The company has obviously found this to be a ▷

▶ **DATE OF FIRST DELIVERY:** Viewpoint—April 1981; Viewpoint/90—First Quarter 1982; Viewpoint/78—January 1983; Viewpoint/Color—May 1983; Viewpoint/78 Color—May 1983; Viewpoint (enhanced version), Viewpoint +, Viewpoint/60 +, and Viewpoint/925+—August 1984; ADDS/XK1, ADDS/XK19, and ADDS/X5A—October 1984.

NUMBER DELIVERED TO DATE: Over 500,000 (all models).

SERVICED BY: ADDS, NCR, TRW, General Electric.

MODELS

Applied Digital Data Systems (ADDS) offers two distinct families of display terminals: the Viewpoint Series and the X Series. The Viewpoint Series of general-purpose alphanumeric terminals currently consists of eight models; the X Series of graphics terminals contains three models. All of ADDS' displays are stand-alone ASCII units that include a display and keyboard.

The Viewpoint Series consists of:

* **Viewpoint**—a basic conversational terminal. The original member of the Viewpoint Series, the Viewpoint was enhanced in July 1984 with a new ergonomic enclosure and a lower price.

* **Viewpoint +**—a version of the Viewpoint that provides emulation of three older Viewpoint models: A1, A2, and 3A+.

* **Viewpoint/Color**—a smart terminal with eight-color (red, green, blue, yellow, magenta, cyan, black, and white) display capability. Editing features, business graphics, and eight function keys are also standard.

* **Viewpoint/60 +**—a smart terminal which includes editing features, business graphics, and eight function keys. The Viewpoint/60+ is an enhanced version of the Viewpoint/60.

* **Viewpoint/78**—a conversational terminal that provides IBM 3278 emulation when used in conjunction with a protocol converter. The terminal's keyboard contains a key layout identical to that of an IBM 3278 Model 2, including 24 function keys.

* **Viewpoint/78 Color**—a color version of the Viewpoint/78.

* **Viewpoint/90**—a smart terminal which includes editing features, business graphics, 15 function keys, and one page of display memory, with a second page optional.

* **Viewpoint/925 +**—a smart terminal that offers TeleVideo 925 emulation

The X Series consists of:

* **ADDS/XK1**—provides graphics capabilities (Tektronix 4010 emulation) plus alphanumeric capabilities (DEC VT100 and TeleVideo 925 compatibility). The ADDS/XK1 features a 14-inch monochrome display with a 1024-by-1024 pixel resolution.

* **ADDS/XK19**—provides all of the features of the ADDS/XK1, with a 19-inch monochrome display.

* **ADDS/X5A**—provides all of the features of the ADDS/XK1, with a 13-inch color display. ▶

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▷ successful strategy, attested to by their strong position in this fiercely competitive market. ADDS' recent product introductions serve to broaden the product line and strengthen that position. The X Series puts ADDS in the graphics terminal market for the first time.

ADDS' manufacturing strategy has, up until recently, also been somewhat different from that of the other players in the ASCII market. The company had been one of the few to continue the manufacturing of complete products in the U.S. The reduction in labor costs made necessary by the current price war has driven most vendors to off-shore manufacturing sources, at least for the production of components if not the complete unit. ADDS had been manufacturing subassemblies at a dedicated plant in Draper, Utah, with final assembly at the company's main plant in New York; however, the company has recently closed the plant and is looking to move off-shore for subassembly manufacturing. The move seems to indicate that some off-shore manufacturing is now almost mandatory for survival in this market.

Another strategy unique to ADDS seems to be the acquisition of needed products from outside sources. The purchase of the AutoGraph X Series of graphics terminals from Datatype has provided ADDS with an established graphics product line. In order to enter the ANSI X3.64-compatible terminal market, ADDS acquired the rights to the Epic 14E product line from floundering Epic Computer Products. The X Series and Viewpoint/925+ will result from these acquisitions.

In 1981, ADDS was itself acquired by NCR Corporation. Then its number-one customer, ADDS has been considerably strengthened by the backing of the computer giant. It is, in fact, the only one of the top four vendors in the ASCII market with this type of backing (Qume, one of the challengers, is owned by communications giant ITT). Like TeleVideo, ADDS has recently entered the microcomputer market.

USER REACTION

In the 1983 Terminal Users' Survey, conducted by Datapro in conjunction with *Data Communications* magazine, a total of 23 responses was received from users of ADDS Viewpoint Series terminals. These users represented an installed base of 634 terminals. Broken down by model, 13 of the users reported on the Viewpoint, 5 on the Viewpoint/90, 2 on the Viewpoint/60, 2 on the Viewpoint A2, and 1 on the Viewpoint/3A Plus. The users were asked to rate their terminals in several categories. Their ratings are summarized in the following table.

	Excellent	Good	Fair	Poor	WA*
Overall performance	12	10	1	0	3.5
Ease of operation	4	16	2	0	3.1
Display clarity	3	18	2	0	3.0
Keyboard feel & usability	4	15	4	0	3.0
Ergonomics	5	13	4	0	3.0
Hardware reliability	4	12	7	0	2.9
Maintenance service/ technical support	6	11	3	2	3.0

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

TRANSMISSION SPECIFICATIONS

Transmission is asynchronous, in half- or full-duplex modes, at speeds from 110 to 19,200 bits per second. An RS-232-C interface is standard, as is an auxiliary serial output interface. RS-422 and 20 ma current loop interfaces are optional. Odd, even, mark, or space parity is selectable.

DEVICE CONTROL

The Viewpoint, Viewpoint +, Viewpoint/78, and Viewpoint/78 Color transmit data character-by-character as it is keyed. Cursor controls move the cursor up, down, left, right, and home. The cursor appears as a blinking or nonblinking block or underline, as selected by the user via a switch. The cursor is addressable. Video attributes include normal video plus a choice of one visual effect per screen: either blinking, underline, reverse video, half intensity, or zero intensity.

The Viewpoint/Color, Viewpoint/60+, Viewpoint/90, and Viewpoint/925+ can transmit character-by-character, by partial or full line, or by page. The cursor can be selected to appear as a blinking or nonblinking block or underline, and it can also be selected to be invisible. Visual attributes available on the Viewpoint/60+, Viewpoint/90, and Viewpoint/925+ include: full/half/zero intensity, blink, underline, and reverse video which can be used in any combination. Visual attributes available on the Viewpoint/Color include: zero intensity, blink, and reverse video.

Edit features available on the Viewpoint/Color, Viewpoint/60+, Viewpoint/90, and Viewpoint/925+ include insert/delete character and insert/delete line. The Viewpoint/60+ includes 8 function keys which can be user-programmed to perform 16 discrete programmed functions. The Viewpoint/Color has 8 preprogrammed function keys, shiftable to 16 functions. The Viewpoint/90 provides 15 function keys with 256 total characters allocated to 30 codes.

The Viewpoint/Color has two pages of memory standard. The Viewpoint/60+ supports a second page optionally, allowing either independant pages or a single 48-line page. On the Viewpoint/90, a second page of memory can be optionally added for use as a display background print buffer, an extra I/O buffer, or additional customer program memory. With the second page, data can be scrolled up or down between pages. Lines or areas on the screen can be designated as locked, in which case the unlocked area can be scrolled independently of the locked area.

The Viewpoint/78 and Viewpoint/78 Color can access IBM 3270 applications on an IBM mainframe when used in conjunction with an appropriate protocol converter. The Viewpoint/78 and Viewpoint/78 Color provide functional emulation of the IBM 3278 Display Station.

Operating parameters on the Viewpoint Series terminal are selected via the terminal's keyboard, from a menu displayed on the screen.

The X Series terminals provide both graphics and alphanumeric capabilities. For graphics applications, the X Series terminals provide Tektronix 4014 graphics terminal emulation and support Tektronix Plot 10 graphics software. For alphanumeric applications, the X Series terminals provide DEC VT100 and TeleVideo 925 compatibility for smart terminal operation. Separate memory planes are available for graphics and alphanumerics. The terminals are based on a Motorola 68000 microprocessor, and provide support for a variety of optional peripheral devices, including digitizers and joysticks. Graphics capabilities supported include zoom, pan, scroll, and draw. ▶

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The users were also asked whether or not they would recommend the Viewpoint terminals to other users. Of the 23 respondents, 18 answered that they would; only 2 stated that they would not, while the remaining 3 were undecided. □

COMPONENTS

VIEWPOINT SERIES CRT DISPLAY UNITS: The Viewpoint, Viewpoint +, Viewpoint/60+, Viewpoint/78, and Viewpoint/90 all include a 12-inch (diagonally measured) nonglare display screen. The Viewpoint/Color and Viewpoint/78 Color feature a 13-inch display, while the Viewpoint/925+ includes a 14-inch display. The standard display capacity is 1920 characters for all models, arranged in a 24-line by 80-character format. A 25th display line for the display of status information is available on all models except the Viewpoint and Viewpoint+. A variable display tilt adjustment is standard on all models; a display swivel capability is standard on all models except the Viewpoint.

White (P4) or green (P31) phosphor characters can be selected on all monochrome models (green only on the Viewpoint/925+). The Viewpoint/Color and Viewpoint/78 Color can assign eight available colors (red, blue, green, yellow, magenta, cyan, black, and white, in P22 phosphor) as desired by the operator. Characters are formed utilizing a 5-by-7 dot matrix on the Viewpoint, Viewpoint +, and Viewpoint/Color, via a 7-by-8 dot matrix on the Viewpoint/90, Viewpoint/78, and Viewpoint/78 Color, and via a 7-by-9 dot matrix on the Viewpoint/60+ and Viewpoint/925+. The 128-character ASCII set is displayable on all models.

A fine-line business graphics capability is standard on the Viewpoint/60+ and Viewpoint/Color. Fine-line and element business graphics are standard on the Viewpoint/90. The following international character sets are available: Belgium, Denmark, Finland, France, Germany, Norway, Spain, Sweden, Switzerland, and United Kingdom.

X SERIES CRT DISPLAY UNITS: The ADDS/XK1 includes a 14-inch (diagonally measured) monochrome display screen; the ADDS/XK19 features a 19-inch display screen. Both models have a display resolution of 1024 by 1024 pixels with a 1024-by-780 pixel viewing window. The ADDS/X5A includes a 13-inch color display screen with a 512-by-512 pixel color presentation and a 512-by-390 pixel viewing window. Up to 16 colors may be displayed simultaneously, from a user-defined palette providing 4096 possible colors. All models except the ADDS/XK19 feature a tilt/swivel display capability.

VIEWPOINT SERIES KEYBOARDS: All models include a detachable, low-profile keyboard. Except for the View-point/78, all of the keyboards feature a typewriter-style layout with a separate numeric pad. The Viewpoint/78 and Viewpoint/78 Color feature a key layout that emulates the keyboard found on the IBM 3278 Display Station Model 2. All keyboards are stepped, contain sculptured keycaps, and feature a nonglare finish. Typamatic keys are also standard on all models.

The Viewpoint and Viewpoint + contain 72 keys, including a 58-key main array, and a 14-key array with numeric entry keys, cursor controls, and three function keys.

The Viewpoint/60+ and Viewpoint/Color contain 78 keys, including a 56-key main array, 14 numeric entry keys, and 8 function keys. Tactile feedback is standard.

The Viewpoint/78 and Viewpoint/78 Color contain 85 keys, divided into an alphanumeric cluster, function key cluster, and editing and mode clusters. Twenty-four program function keys and two program attention keys are included.

The Viewpoint/90 contains 89 keys, including a 56-key main array, an 18-key numeric entry pad, and 15 function keys. Tactile feedback is standard. Also included are three unpopulated key positions, with unique codes defined in nonvolatile memory.

When ordered with optional foreign-compatible power supplies, the Viewpoint and Viewpoint+ include the appropriate foreign key caps. Other models feature optional kits for foreign languages.

PRICING

All Viewpoint and X Series terminals are available for purchase only. Quantity discounts are available for OEMs and end users. The following purchase prices are single-quantity end-user prices. Contact ADDS for OEM pricing.

Model	Purchase Price ($)
Viewpoint	549
Viewpoint +	595
Viewpoint/Color	995
Viewpoint/60+	749
Viewpoint/78	1,095
Viewpoint/78 Color	1,595
Viewpoint/90	1,195
Viewpoint/925+	749
ADDS/XK1	3,295
ADDS/XK19	4,495
ADDS/XK5A	3,595 ∎

ADDS Viewpoint Series Display Terminals

The Viewpoint/60, introduced by ADDS in April 1982, is a mid-range smart terminal. Standard features include conversational and block mode transmission, editing features, and visual attributes. The Viewpoint/60 contains a 12-inch non-glare display with a two-position tilt adjustment, and a detachable keyboard. All of the models in the Viewpoint Series (except the Viewpoint/Color) have the same physical appearance.

MANAGEMENT SUMMARY

Applied Digital Data Systems (ADDS) introduced the original Viewpoint display terminal in March, 1981. This introduction proved to have a sharp impact on the ASCII terminal market. With a single unit purchase price of $650, the Viewpoint was priced significantly lower than any comparable terminal on the market at that time. The ADDS introduction triggered a flurry of activity in the market, as competitors added new models (Hazeltine Esprit) or slashed prices on established models (Lear Siegler ADM 3A and ADM 5) in response. Today, virtually all of the major ASCII terminal vendors feature low-end models selling in the $600-to-$700 price range—and prices continue to fall.

ADDS hopes to have the same impact on the general-purpose color display market with their newest product, the Viewpoint/Color. Introduced at the Comdex show in Las Vegas in November 1982, the Viewpoint/Color represents the same price breakthrough that the original Viewpoint did. In OEM quantities of 100 or more, the new Viewpoint/Color is the first general-purpose color terminal to carry a price tag below $1,000 ($995). If current trends in the terminal industry continue (and there is no reason to believe that they won't), other vendors will follow with low-priced color units, and there may come a time in the near future when color units become as commonplace as monochrome terminals are today.

Since the introduction of the original Viewpoint, ADDS has added additional models to form the Viewpoint termi- ▷

One of the industry's leading families of low-priced, general purpose ASCII display terminals.

ADDS has recently enhanced the family with the addition of the Viewpoint/Color, which is currently the lowest priced general-purpose color display on the market. In addition to the Viewpoint/Color, the Viewpoint Series contains five monochrome models, ranging from the basic conversational Viewpoint to the smart Viewpoint/90. All of the Viewpoint terminals (with the exception of Viewpoint/Color) feature the same basic design, including a 12-inch non-glare display (13-inches on the Viewpoint/Color), tilt adjustment, and a detachable keyboard.

Prices for the Viewpoint Series range from $650 to $1,095, in single quantities. OEM discounts are available.

CHARACTERISTICS

VENDOR: Applied Digital Data Systems (ADDS) Inc., 100 Marcus Boulevard, Hauppauge, NY 11787. Telephone (516) 231-5400.

DATE OF ANNOUNCEMENT: Viewpoint—March 1981; Viewpoint/3A Plus and Viewpoint/90—December 1981; Viewpoint/60—April 1982; Viewpoint/78 and Viewpoint/Color—November 1982.

DATE OF FIRST DELIVERY: Viewpoint—April 1981; Viewpoint/3A Plus and Viewpoint/90—First quarter 1982; Viewpoint/60—June 1982; Viewpoint/78—January 1983; Viewpoint/Color—May 1983 (scheduled).

NUMBER DELIVERED TO DATE: Over 320,000 (including older Consul, Envoy, MRD, and Regent series).

SERVICED BY: ADDS, NCR, TRW, General Electric.

MODELS

The Viewpoint Series of display terminals currently consists of six models, all of which are stand-alone ASCII terminals. The series consists of:

- Viewpoint—the original member of the family; a basic conversational terminal.

- Viewpoint/3A Plus—a conversational terminal with two operation modes: 3A mode offers Lear Siegler ADM 3A emulation; Plus mode offers additional features and some compatibility with the Lear Siegler ADM 5, Soroc IQ 120, and TeleVideo 912/920.

- Viewpoint/78—a conversational terminal that provides IBM 3278 emulation when used in conjunction with a protocol converter. The terminal's keyboard contains a ▷▷

ADDS Viewpoint Series Display Terminals

▷ nal family. Including the new Viewpoint/Color, the family now consists of six members, the others being the Viewpoint/60, Viewpoint/78, Viewpoint/90, and Viewpoint/3A Plus. This family will eventually succeed the popular and successful Regent Series.

All of the Viewpoint models feature essentially the same ergonomic design. A 12-inch (diagonal) display screen is standard on all models except the Viewpoint/Color, which contains a slightly larger 13-inch screen. The standard screen arrangement on all models is 24 lines by 80 characters. The display contains a tilt adjustment for operator comfort; in addition, the Viewpoint/Color provides a swivel capability for the display. A detachable keyboard is standard on all models, featuring a typewriter-style layout (except for the Viewpoint/78, which contains an IBM 3278-style layout).

The original Viewpoint is a basic conversational terminal with limited editing capabilities. In addition to conversational mode transmission, the Viewpoint includes visual attributes, such as blink, underline, zero/half intensity, and reverse video, and an addressable cursor. The Viewpoint/3A Plus is also a conversational terminal, and contains all of the features of the Viewpoint. In addition, the Viewpoint/3A Plus offers two operating modes. In the terminal's "3A" mode, the Viewpoint/3A Plus is compatible with the Lear Siegler ADM 3A. In "Plus" mode, the terminal offers several additional features, as well as some compatibility with the Lear Siegler ADM 5, the Soroc IQ 120, and the TeleVideo 912/920.

The newest conversational member of the Viewpoint series is the Viewpoint/78, which was introduced along with the Viewpoint/Color at Comdex '82. The Viewpoint/78 is designed to provide the user with IBM 3278 compatibility when used in conjunction with a protocol converter. Up to eight Viewpoint/78s may be connected to a single protocol converter for communications with an IBM host. The terminal may be remotely located and the protocol converter may be accessed via dial-up over standard switched telephone lines. The Viewpoint/78's keyboard contains a layout identical to the IBM 3278 Model 2, to eliminate the need for operator re-training.

The Viewpoint/90 was the first smart terminal to be added to the Viewpoint Series. Enhanced features available on the Viewpoint/90 include: full editing (insert/delete line, insert/delete character); visual attributes (full/half and zero intensities, blink, underline, and reverse video, in any combination); single or double wide characters; 15 function keys; business graphics; a page of display memory, with a second page optional; non-destructive scrolling up and down (between pages, if the two-page option is selected); and an optional 132-character per line capability. Green phosphor characters may be selected in lieu of the white phosphor characters, which are standard on the low-end models.

The Viewpoint/60 fits in between the conversational Viewpoint models and the Viewpoint/90 in capability. The ▷

▶ key layout identical to that of an IBM 3278 Model 2, including 24 function keys.

- **Viewpoint/60**—a smart terminal which includes editing features, business graphics, and eight function keys.

- **Viewpoint/90**—a smart terminal which includes editing features, business graphics, 15 function keys, and one page of display memory, with a second page optional.

- **Viewpoint/Color**—a smart terminal with eight color (red, green, blue, yellow, magenta, cyan, black, and white) display capability. Editing features, business graphics, and eight function keys are also standard.

TRANSMISSION SPECIFICATIONS

Transmission is asynchronous, in half- or full-duplex modes, at speeds from 110 to 19,200 bits per second. An RS–232–C interface is standard, as is an auxiliary serial output interface. RS–422 and 20mA current loop interfaces are optional. Odd, even, mark, or space parity is selectable.

DEVICE CONTROL

The Viewpoint, Viewpoint/3A Plus, and Viewpoint/78 transmit data character-by-character as it is keyed. Cursor controls move the cursor up, down, left, right, and home. The cursor appears as a blinking or non-blinking block or underline, as selected by the user via a switch. The cursor is addressable. Video attributes include normal video plus a choice of one visual effect per screen: either blinking, underline, reverse video, half intensity, or zero intensity.

The Viewpoint/60, Viewpoint/90, and Viewpoint/Color can transmit character-by-character, by partial or full line, or by page. The cursor can be selected to appear as a blinking or non-blinking block or underline, and it can also be selected to be invisible. Visual attributes available on the Viewpoint/60 and Viewpoint/90 include: full/half/zero intensity, blink, underline, and reverse video, and can be used in any combination. Visual attributes available on the Viewpoint/Color include: zero intensity, blink, and reverse video.

Edit features available on the Viewpoint/60, Viewpoint/90, and Viewpoint/Color include insert/delete character and insert/delete line. The Viewpoint/60 and Viewpoint/Color include eight function keys which can be user-programmed to perform 16 discrete programmed functions. The Viewpoint/90 provides 15 function keys with 256 characters total allocated to 30 codes.

All three models include one page of display memory. On the Viewpoint/90, a second page of memory can be optionally added for use as a display background print buffer, an extra I/O buffer, or additional customer program memory. With the second page, data can be scrolled up or down between pages. Lines or areas on the screen can be designated as locked, in which case the unlocked area can be scrolled independently of the locked area.

COMPONENTS

CRT DISPLAY UNIT: All models except the Viewpoint/Color feature a 12-inch (diagonally measured) non-glare display screen; the Viewpoint/Color's display measures 13 inches diagonally. The standard display capacity is 1920 characters for all models, arranged in a 24-line by 80-character format. A 132-character display format is optional on the Viewpoint/90. A 25th display line for the display of status information is available on all models except the Viewpoint and Viewpoint 3A/Plus. A two-position display ▶

ADDS Viewpoint Series Display Terminals

▷ Viewpoint/60 is a smart unit with editing features, business graphics, and eight function keys. The terminal is intended to provide a "migration path" from ADDS' Regent 40 and Regent 60 display terminals, and will eventually replace these older models.

The Viewpoint/Color can assign eight standard colors: red, green, blue, yellow, magenta, cyan, black, and white. The Viewpoint/Color contains smart terminal features, including conversational and block mode transmission, full editing features, some visual attributes (blink, blank, and reverse video), and business graphics. The terminal's keyboard provides eight function keys.

ADDS provides quantity discounts for end-users and OEMs on all Viewpoint terminals. In addition, ADDS also will provide customized features for OEMs. ADDS is a subsidiary of NCR, and is an acknowledged leader in the general-purpose ASCII terminal market.

USER REACTION

Datapro's 1982 Terminal Users' Survey, conducted in conjunction with *Data Communications* magazine during June, July, and August 1982, yielded three responses on the ADDS Viewpoint display terminal. These three responses represented a combined total of 28 installed units. The users were asked to rate their terminals in six specific areas. The ratings given to the Viewpoint are summarized in the following table.

	Excellent	Good	Fair	Poor	WA*
Overall performance	2	1	0	0	3.7
Ease of operation	1	2	0	0	3.3
Display clarity	2	1	0	0	3.7
Keyboard feel & usability	1	2	0	0	3.3
Hardware reliability	2	1	0	0	3.7
Maintenance service/ technical support	0	2	1	0	2.7

*Weighted Average on a scale of 4.0 for Excellent.

In addition to the ratings, the users were asked whether or not they would recommend the Viewpoint display terminal to other users with similar applications. All three users indicated that they would.□

► tilt adjustment is standard on all models; the Viewpoint/ Color also features a display swivel capability.

White (P4) phosphor characters are standard on all models except the Viewpoint/Color. Green (P31) phosphor characters are also available as an option on all models (this is a no-charge option on the Viewpoint/60 and Viewpoint/90). The Viewpoint/Color can assign eight available colors (red, blue, green, yellow, magenta, cyan, black, and white, in P22 phosphor) as desired by the operator. Characters are formed utilizing a 5-by-7 dot matrix on the Viewpoint, Viewpoint/3A Plus, and Viewpoint/Color, via a 7-by-8 dot matrix on the Viewpoint/60 and Viewpoint/78, and via a 7-by-9 dot matrix on the Viewpoint/90. The 128-character ASCII set is displayable on all models.

A fine-line business graphics capability is standard on the Viewpoint/60 and Viewpoint/Color. Fine-line or element business graphics are standard on the Viewpoint/90. All models feature six selectable international character sets: Germany, France, United Kingdom, Spain, Sweden, and Denmark.

KEYBOARDS: All models feature a detachable keyboard. Except for the Viewpoint/78, all of the keyboards feature a typewriter-style layout with a separate numeric pad. The Viewpoint/78 emulates the keyboard found on the IBM 3278 Model 2. All keyboards are stepped, contain sculptured keycaps, and feature a non-glare finish. Typamatic is also standard on all models.

The Viewpoint and Viewpoint/3A Plus contain 72 keys, including a 58-key main array, and a 14-key array with numeric entry keys, cursor controls, and three function keys.

The Viewpoint/60 and Viewpoint/Color contain 78 keys, including a 56-key main array, 14 numeric entry keys, and eight function keys. Tactile feedback is standard.

The Viewpoint/78 contains 85 keys, divided into an alphanumeric cluster, function key cluster, and editing and mode clusters. Twenty-four program function keys and two program attention keys are included.

The Viewpoint/90 contains 89 keys, including a 56-key main array, an 18-key numeric entry pad, and 15 function keys. Tactile feedback is standard. Also included are three unpopulated key positions, with unique codes defined in non-volatile memory.

When ordered with optional foreign compatible power supplies, the appropriate foreign key caps are included.

PRICING

All Viewpoint Series terminals are available for purchase only. Quantity discounts are available for OEMs and end-users. The following purchase prices are single-quantity end-user prices. Contact ADDS for OEM pricing.

	Purchase Price
Viewpoint	$ 650
Viewpoint 3A/Plus	650
Viewpoint/60	895
Viewpoint/78	1,095
Viewpoint/90	895
Viewpoint/Color	1,095 ■

ADDS Regent Display Terminals

The Regent 25 has a display capacity of 1920 characters in a 24-line by 80-character format. The typewriter-style keyboard features a separate numeric and cursor control pad.

MANAGEMENT SUMMARY

ADDS' Regent Series of display terminals is the successor to its earlier lines of terminals, including the Consul, Envoy, and MRD Series. The Regent terminals are microprocessor-controlled, stand-alone units. The line currently consists of four basic models: the Regent 20, 25, 40, and 60. All models consist of a 12" diagonal display screen capable of displaying 1920 characters in a 24-line by 80-character format (plus a 25th line for status information), dot matrix characters which are displayed in black on a white background, reverse video, and a typewriter-style keyboard. A 96-character ASCII set plus 32 control codes is displayable.

The Regent 20 is a basic conversational terminal. Characters are displayed using a 5 x 8 dot matrix with lower case descenders. Fully incremental cursor movement and addressability are featured. EIA RS-232-C and 20 mA current loop interfaces are included, and transmission speeds up to 9600 bps can be selected. Data entry is accomplished via the 59-key typewriter layout keyboard. The Regent 25 contains all of the features of the Regent 20, while adding a separate 18-key array that contains an ANSI standard numeric pad layout, plus cursor control, comma, and Enter keys. Both the Regent 20 and 25 have a Monitor Mode feature that aids application development and debugging by turning the terminal into a line monitor that will display the data stream sent to the terminal (including the 32 control codes). Both models also contain seven resident national character sets, including U.S., United Kingdom, French, German, Swedish/Finnish, Danish/Norwegian, and Spanish. The Regent 25 is also available with Hazeltine 1500, Soroc IQ 120, and Microdata Prism emulation. ▷

A family of microprocessor-controlled, stand-alone CRT display/keyboard terminals.

All models feature a 12" diagonally measured display screen which can accommodate 1920 characters in a 24-line by 80-character format. A 25th line displays status information. A typewriter-style keyboard is standard, and some models include a separate numeric pad, function keys, editing and transmission mode keys, and the option of a detachable keyboard.

Also standard on all models are the following features: addressable cursor, reverse video, typamatic keys, and switch-selectable transmission mode and rates.

End user prices range from $695 to $1,700, with discounts for quantities over 25 available. OEM pricing may be obtained by contacting ADDS.

CHARACTERISTICS

DATE OF ANNOUNCEMENT: Information not available.

DATE OF FIRST DELIVERY: Regent 20, 25, and 40—March 1979; Regent 60—July 1979.

NUMBER DELIVERED TO DATE: Over 200,000 (all models, including older Consul, Envoy, and MRD Series).

SERVICED BY: ADDS, TRW, or General Electric.

MODELS

The ADDS Regent Series currently consists of four basic models of display terminals; some of these are available with special emulation, bringing the total number of terminal models available to 10. The family consists of the following members:

● *Regent 20*—a basic conversational stand-alone terminal with a typewriter-style keyboard.

● *Regent 25*—contains all of the features of the Regent 20, plus a separate 18-key array on the keyboard that includes a numeric pad and cursor control, comma, and Enter keys. The Regent 25 is also available in three additional models including Hazeltine 1500, Soroc IQ 120, and Microdata Prism emulation.

● *Regent 40*—a conversational terminal that is equipped with a 14-key numeric pad, eight function keys, five cursor ▶

ADDS Regent Display Terminals

▷ The Regent 40 is also a conversational terminal, but with additional features, not found in the Regent 20 or 25, that offer improved versatility. The Regent 40 keyboard includes a 14-key numeric pad, plus eight function keys, five cursor control keys, and an auxiliary port control key. Characters are formed within an 8 x 8 dot matrix. Visual attributes available on the Regent 40 include reverse video, blinking at two frames per second, underline, and full, half, and zero intensity. Eleven special line-drawing symbols are also included for limited graphics capability. The Monitor Mode feature is available on the Regent 40, as well as the following additional features: insert/delete line, read terminal status, and self diagnostics.

The Regent 60 is a buffered terminal capable of conversational (character at a time), message (line at a time), or page (full or partial screen at a time) transmission. The Regent 60 keyboard has all of the features of the Regent 40 keyboard, plus Print Local, editing, and transmission mode keys. In the buffered mode, the operator has the ability to transmit only those fields in which data has been altered. Additional editing features available on the Regent 60 include erase to end of line, erase to end of page, character overwrite, back space, forward and backward tab, and character as well as line insert/delete. The Monitor Mode feature is also included on the Regent 60.

The ADDS family of display terminals continue to be one of the more prominent display terminal families on the market. Selling primarily to the OEM market, ADDS has shipped over 200,000 terminals since the company was founded in 1969. Sales to end users are on a purchase-only basis; no lease plans are currently available through ADDS.

ADDS was recently acquired by NCR, which is operating the company as a wholly-owned subsidiary under present ADDS management.

USER REACTION

In Datapro's 1980 survey of alphanumeric display terminal users, responses were received from seven users of ADDS Regent display terminals, covering a total of 83 units. (In our 1981 survey, Regent terminals were not separately identified from other ADDS terminals.) The ratings obtained from these users are as follows:

	Excellent	Good	Fair	Poor	WA*
Overall performance	2	5	0	0	3.3
Ease of operation	1	4	1	1	2.7
Display clarity	3	4	0	0	3.4
Keyboard feel & usability	1	5	0	1	2.9
Hardware reliability	4	2	1	0	3.4
Maintenance service	2	2	2	0	3.0
Technical support	0	4	1	1	2.5

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

Two users felt positive enough about the ADDS terminals to add additional comments to their replies. ▷

▶ control keys, and an auxiliary port control key. A variety of visual attributes such as blinking, full, half or zero intensity, and underlining are included, as well as 11 special line drawing symbols and an insert/delete line feature. An additional model, the Regent 42, contains all of the features of the Regent 40 but implements Regent 100 firmware. Also available is the Regent 40/VT, which features DEC VT-52 emulation.

* *Regent 60*—a smart buffered terminal that offers the choice of operation in conversational (character at a time) mode, message (line at a time) mode, and page (full or partial screen at a time) mode. The Regent 60 contains all of the basic features of the Regent 40 plus additional features such as erase to end of line, erase to end of page, character overwrite, forward and backward tab, and character as well as line insert/delete. A modified data transmission feature allows the operator to transmit only those fields in which data has been altered. An additional model, the Regent 62, implements Regent 200 firmware.

TRANSMISSION SPECIFICATIONS

All models operate simultaneously in half- or full-duplex mode at which selectable speeds from 110 to 9600 bits per second. The 8-level ASCII transmission code is used. Odd, even, mark, or space parity can be selected. An EIA RS-232-C or 20 mA current loop interface may be selected. The Regent 20, 25, 40, and 60, are equipped with an auxiliary EIA serial output peripheral interface.

DEVICE CONTROL

Regent 20 and 25: Transmission is performed on a character-by-character basis as each character is keyed. Received and keyed commands execute carriage return, line feed, and keyboard lock/unlock functions. The cursor is addressable through direct positioning by either incremental steps, absolute address, or separate line or column address. The cursor appears as either a block or an underline, either solid or blinking (switch-selectable). A print transparent feature allows the terminal to pass all received data to the auxiliary port without reacting to the commands of the display data stream. A feature called monitor mode enables the terminal to become a line monitor that will display the data stream including control characters, sent ot the terminal.

Regent 40: Transmission is performed on a character-by-character basis as each character is keyed. Received and keyed commands execute carriage return, line feed, and keyboard lock/unlock. The cursor is addressable through direct positioning by either discrete or absolute address. The cursor can be selected as either a blinking or non-blinking block or underline. Video attributes include reverse video, blinking (at two frames per second), underline, and full, half, or zero intensity. Monitor mode and the print transparent feature are included, as with the Regent 20 and 25. A read terminal status feature allows the host computer to interrogate for terminal status, present cursor address, and memory value at cursor position. A self-diagnostic firmware program provides a self-test feature upon power-up; the result is shown on the status line. Editing can be accomplished through an insert/delete line feature. The Regent 40 contains eight pre-programmed function keys, and five cursor control keys to position the cursor left, right, up, down, or home.

Regent 60: Transmission can be performed on a character-by-character basis as the data is keyed, or from the buffer a line at a time or a full or partial screen at a time. The cursor is addressable through direct positioning by either discrete or absolute address. The cursor is selectable as a blinking or non-blinking block or underline. Video attributes include reverse video, blinking, underline, and full, half, and zero ▶

ADDS Regent Display Terminals

▷ "The Regent 25 works very well for an NCR 796-101 replacement at half the cost," stated one user. "The numeric pad is much more functional." This user also praised the reverse video feature. He added that they were currently using the Regent terminal with an NCR 8200 system, and that they had several more Regent terminals on order for use with an NCR V8455 system.

A second user, with both Regent 25 and Regent 100 terminals installed, stated that he was so pleased with the performance of the terminals that his company had also ordered additional units.

Three of the users reported that they were using their Regent terminals as plug-compatible replacements for Teletype 33/35 terminals. Two users are using the terminals as replacements for DEC VT Series terminals, and one as an NCR 796 Series replacement. Only one of the seven respondents reported that he received maintenance service from ADDS; the six remaining users have third-party maintenance.□

▶ intensity. Monitor mode, as well as the print transparent, read terminal status, and self-test features are included. Editing features include erase to end of line, erase to end of page, character overwrite, back space, forwrd and backward tab, and character and line insert/delete. The Regent 60 includes eight pre-programmed function keys, and five cursor control keys to position the cursor up, down, left, right, and home.

COMPONENTS

CRT DISPLAY UNIT: All models are equipped with a 12″ (diagonally measured) display screen. Display capacity is 1920 characters in a 24-line by 80-column format. A 25th line displays status information. Characters are formed by utilizing a 5 x 8 dot matrix (Regent 20 and 25) or an 8 x 8 dot

The Regent 60 is a smart buffered display terminal which can operate in conversational, message, or page modes.

matrix (all others). The display presentation is dark characters on a light background, or light characters on a dark background for reverse video. A 96-character ASCII set plus 32 ASCII control codes can be displayed. An 11 symbol line drawing set is available on all models except the Regent 20 and 25. Refresh rate is 60 frames per second (50 frames per second for export model).

KEYBOARDS: All models feature a typewriter-style keyboard.

Regent 20: a 59-key keyboard with typamatic keys. Seven national character sets are resident: U.S., U.K., Danish/Norwegian, Swedish/Finnish, German, French, and Spanish.

Regent 25: a 76-key keyboard with typamatic keys. A separate 18-key array contains an ANSI standard numeric pad layout, cursor control keys, and comma and Enter keys. The national character sets resident in the Regent 20 are also resident in the Regent 25.

Regent 40: an 87-key keyboard (most are typamatic keys). Includes a 14-key numeric pad, eight pre-programmed function keys, five cursor control keys, and an auxiliary port control key.

Regent 60: a 101-key keyboard (most are typamatic keys). Includes a 14-key numeric pad, eight pre-programmed function keys, five cursor control keys, and a total of 14 keys for editing, selection of transmission mode, and Print Local.

PRICING

The ADDS Regent display terminals are available for purchase only. Quantity discounts are provided for end-user and OEM purchases. Maintenance service and installation are provided by TRW's Customer Service Division, which services Regent models only, or by General Electric's Apparatus Service Business Division. Installation is priced at $80 per terminal for terminals installed by GE; for GTE-supplied units, installation charges are determined on an individual basis with the nearest TRW field office. The investment tax credit is passed on to the customer for the purchased units only. ADDS does not provide any formal training on its terminals.

ADDS warrants each terminal for a period of 90 days from the date of shipment. The warranty covers defects in material and workmanship under normal use and service. The warranty period is extended to two years under the ADDS Extended Warranty Options, which is available at a cost of $100 per terminal.

	Purchase Price
Regent 20	$ 695
Regent 25	1,095
Regent 25/1500	995
(Hazeltine 1500 emulation)	
Regent 25/120	995
(Soroc IQ 120 emulation)	
Regent 25/P	995
(Microdata Prism emulation)	
Regent 40	1,300
Regent 42	1,480
Regent 40/VT	1,415
Regent 60	1,500
Regent 62	1,700■

ADDS Regent Display Terminals

The Regent 25 has a display capacity of 1920 characters in a 24-line by 80-character format. The typewriter-style keyboard features a separate numeric and cursor control pad.

A family of microprocessor-controlled, stand-alone CRT display/keyboard terminals.

All models feature a 12" diagonally measured display screen which can accommodate 1920 characters in a 24-line by 80-character format. A 25th line displays status information. A typewriter-style keyboard is standard, and some models include a separate numeric pad, function keys, editing and transmission mode keys, and the option of a detachable keyboard.

Also standard on all models are the following features: addressable cursor, reverse video, typamatic keys, and switch-selectable transmission mode and rates.

End user prices range from $695 to $1,975, with discounts for quantities over 25 available. OEM pricing may be obtained by contacting ADDS.

MANAGEMENT SUMMARY

ADDS' Regent Series of display terminals is the successor to its earlier lines of terminals, including the Consul, Envoy, and MRD Series. The Regent terminals are microprocessor-controlled, stand-alone units. The line currently consists of six basic models: the Regent 20, 25, 40, 60, 100, and 200. All models consist of a 12" diagonal display screen capable of displaying 1920 characters in a 24-line by 80-character format (plus a 25th line for status information), dot matrix characters which are displayed in black on a white background, reverse video, and a typewriter-style keyboard. A 96-character ASCII set plus 32 control codes is displayable.

The Regent 20 is a basic conversational terminal. Characters are displayed using a 5 x 8 dot matrix with lower case descenders. Fully incremental cursor movement and addressability are featured. EIA RS-232-C and 20 mA current loop interfaces are included, and transmission speeds up to 9600 bps can be selected. Data entry is accomplished via the 59-key typewriter layout keyboard. The Regent 25 contains all of the features of the Regent 20, while adding a separate 18-key array that contains an ANSI standard numeric pad layout, plus cursor control, comma, and Enter keys. Both the Regent 20 and 25 have a Monitor Mode feature that aids application development and debugging by turning the terminal into a line monitor that will display the data stream sent to the terminal (including the 32 control codes). Both models also contain seven resident national character sets, including U.S., United Kingdom, French, German, Swedish/Finnish, Danish/Norwegian, and Spanish. The Regent 25 is also available with Hazeltine 1500, Soroc IQ 120, and Microdata Prism emulation. ▷

CHARACTERISTICS

VENDOR: Applied Digital Data Systems (ADDS) Inc., 100 Marcus Boulevard, Hauppauge, New York 11787. Telephone (516) 231-5400.

DATE OF ANNOUNCEMENT: Information not available.

DATE OF FIRST DELIVERY: Regent 100 and 200—November 1977; Regent 20, 25, and 40—March 1979; Regent 60—July 1979.

NUMBER DELIVERED TO DATE: Approximately 200,000 (all models, including older Consul, Envoy, and MRD Series).

SERVICED BY: ADDS, TRW, or General Electric.

MODELS

The ADDS Regent Series currently consists of six basic models of display terminals; some of these are available with special emulation, bringing the total number of terminal models available to 12. The family consists of the following members:

- **Regent 20**—a basic conversational stand-alone terminal with a typewriter-style keyboard.

- **Regent 25**—contains all of the features of the Regent 20, plus a separate 18-key array on the keyboard that includes a numeric pad and cursor control, comma, and Enter keys. The Regent 25 is also available in three additional models including Hazeltine 1500, Soroc IQ 120, and Microdata Prism emulation.

- **Regent 40**—a conversational terminal that is equipped with a 14-key numeric pad, eight function keys, five cursor ▶

ADDS Regent Display Terminals

▷ The Regent 40 is also a conversational terminal, but with additional features, not found in the Regent 20 or 25, that offer improved versatility. The Regent 40 keyboard includes a 14-key numeric pad, plus eight function keys, five cursor control keys, and an auxiliary port control key. Characters are formed within an 8 x 8 dot matrix. Visual attributes available on the Regent 40 include reverse video, blinking at two frames per second, underline, and full, half, and zero intensity. Eleven special line-drawing symbols are also included for limited graphics capability. The Monitor Mode feature is available on the Regent 40, as well as the following additional features: insert/delete line, read terminal status, and self diagnostics.

The Regent 60 is a buffered terminal capable of conversational (character at a time), message (line at a time), or page (full or partial screen at a time) transmission. The Regent 60 keyboard has all of the features of the Regent 40 keyboard, plus Print Local, editing, and transmission mode keys. In the buffered mode, the operator has the ability to transmit only those fields in which data has been altered. Additional editing features available on the Regent 60 include erase to end of line, erase to end of page, character overwrite, back space, forward and backward tab, and character as well as line insert/delete. The Monitor Mode feature is also included on the Regent 60.

The Regent 100 and the Regent 200 are the senior members of the Regent Series. The Regent 100 is a conversational terminal which possesses most of the features of the newer Regent 40, plus a detachable keyboard option. The Regent 200 is a buffered terminal capable of operation in conversational, message, or page mode. The Regent 200 contains most of the features of the Regent 60, plus the option of a detachable keyboard.

The ADDS family of display terminals continue to be one of the more prominent display terminal families on the market. Selling primarily to the OEM market, ADDS has shipped somewhere in the vicinity of 200,000 terminals since the company was founded in 1969. Sales to end users are on a purchase-only basis; no lease plans are currently available through ADDS.

ADDS was recently acquired by NCR, which is operating the company as a wholly-owned subsidiary under present ADDS management.

USER REACTION

In Datapro's 1980 survey of alphanumeric display terminal users, responses were received from seven users of ADDS Regent display terminals, covering a total of 83 units. The ratings obtained from these users are as follows: ▷

▶ control keys, and an auxiliary port control key. A variety of visual attributes such as blinking, full, half or zero intensity, and underlining are included, as well as 11 special line drawing symbols and an insert/delete line feature. An additional model, the Regent 42, contains all of the features of the Regent 40 but implements Regent 100 firmware. Also available is the Regent 40/VT, which features DEC VT-52 emulation.

- *Regent 60*—a smart buffered terminal that offers the choice of operation in conversational (character at a time) mode, message (line at a time) mode, and page (full or partial screen at a time) mode. The Regent 60 contains all of the basic features of the Regent 40 plus additional features such as erase to end of line, erase to end of page, character overwrite, forward and backward tab, and character as well as line insert/delete. A modified data transmission feature allows the operator to transmit only those fields in which data has been altered. An additional model, the Regent 62, implements Regent 200 firmware.

- *Regent 100*—an older model conversational terminal which possesses most of the features of the Regent 40, plus the option of adding a detachable keyboard.

- *Regent 200*—an older model buffered terminal capable of operation in either conversational, message, or page mode. The Regent 200 possesses most of the features of the Regent 60, plus the option of adding a detachable keyboard.

TRANSMISSION SPECIFICATIONS

All models operate simultaneously in half- or full-duplex mode at which selectable speeds from 110 to 9600 bits per second (75 to 9600 bps for Regent 100 and 200). The 8-level ASCII transmission code is used. Odd, even, mark, or space parity can be selected. An EIA RS-232-C or 20 mA curent loop interface may be selected. The Regent 20, 25, 40, 60, and 200 are equipped with an auxiliary EIA serial output peripheral interface; the interface is optional on the Regent 100.

DEVICE CONTROL

Regent 20 and 25: Transmission is performed on a character-by-character basis as each character is keyed. Received and keyed commands execute carriage return, line feed, and keyboard lock/unlock functions. The cursor is addressable through direct positioning by either incremental steps, absolute address, or separate line or column address. The cursor appears as either a block or an underline, either solid or blinking (switch-selectable). A print transparent feature allows the terminal to pass all received data to the auxiliary port without reacting to the commands of the display data stream. A feature called monitor mode enables the terminal to become a line monitor that will display the data stream including control characters, sent ot the terminal.

Regent 40: Transmission is performed on a character-by-character basis as each character is keyed. Received and keyed commands execute carriage return, line feed, and keyboard lock/unlock. The cursor is addressable through direct positioning by either discrete or absolute address. The cursor can be selected as either a blinking or non-blinking block or underline. Video attributes include reverse video, blinking (at two frames per second), underline, and full, half, or zero intensity. Monitor mode and the print transparent feature are included, as with the Regent 20 and 25. A read terminal status feature allows the host computer to interrogate for terminal status, present cursor address, and memory value at cursor position. A self-diagnostic firmware program provides a self-test feature upon power-up; the result is shown on the status line. Editing can be accomplished through an insert/delete line feature. The ▶

ADDS Regent Display Terminals

	Excellent	Good	Fair	Poor	WA*
Overall performance	2	5	0	0	3.3
Ease of operation	1	4	1	1	2.7
Display clarity	3	4	0	0	3.4
Keyboard feel & usability	1	5	0	1	2.9
Hardware reliability	4	2	1	0	3.4
Maintenance service	2	2	2	0	3.0
Technical support	0	4	1	1	2.5

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

Two users felt positive enough about the ADDS terminals to add additional comments to their replies. "The Regent 25 works very well for an NCR 796-101 replacement at half the cost," stated one user. "The numeric pad is much more functional." This user also praised the reverse video feature. He added that they were currently using the Regent terminal with an NCR 8200 system, and that they had several more Regent terminals on order for use with an NCR V8455 system.

A second user, with both Regent 25 and Regent 100 terminals installed, stated that he was so pleased with the performance of the terminals that his company had also ordered additional units.

Three of the users reported that they were using their Regent terminals as plug-compatible replacements for Teletype 33/35 terminals. Two users are using the terminals as replacements for DEC VT Series terminals, and one as an NCR 796 Series replacement. Only one of the seven respondents reported that he received maintenance service from ADDS; the six remaining users have third-party maintenance.□

▶ Regent 40 contains eight pre-programmed function keys, and five cursor control keys to position the cursor left, right, up, down, or home.

Regent 60: Transmission can be performed on a character-by-character basis as the data is keyed, or from the buffer a line at a time or a full or partial screen at a time. The cursor

The Regent 100, a senior member of the Regent family, can be configured detachable keyboard as an option.

is addressable through direct positioning by either discrete or absolute address. The cursor is selectable as a blinking or non-blinking block or underline. Video attributes include reverse video, blinking, underline, and full, half, and zero intensity. Monitor mode, as well as the print transparent, read terminal status, and self-test features are included. Editing features include erase to end of line, erase to end of page, character overwrite, back space, forwrd and backward tab, and character and line insert/delete. The Regent 60 includes eight pre-programmed function keys, and five cursor control keys to position the cursor up, down, left, right, and home.

Regent 100: Transmission is performed on a character-by-character basis as each character is keyed. Received and keyed commands execute carriage return, line feed, screen erase, cursor positioning, and keyboard lock/unlock functions. The cursor is addressable using either of two schemes: an Escape sequence containing a cursor coordinate code, or the ADDS Consul 580 command sequence containing the cursor location. Highlighting features include dual intensity, blanking, reverse video, blinking and underline. An operator-selectable roll function is provided. Data is rolled off the screen as it is keyed or entered after the last line is filled. Automatic line feed on carriage return is also an operator-selectable feature. An option package provides five discrete cursor control keys and eight program-defined function keys. The optional cursor control keys move the cursor up, down, left, right, and home. Terminal status information, such as terminal mode (on-/off-line), auxiliary port enabled/disabled, and communications line status, is displayed on the 25th line of the screen. A self-diagnostic firmware routine performs a diagnostic check each time the terminal powers up; the results are displayed in the status line. The host processor can interrogate the Regent 100 for the current cursor address and memory contents (or value) at the cursor location.

Regent 200: Three operating modes are provided: Conversational, Message, and Page. Conversational mode transmits a character for each key depression. Page mode transmits a full or partial page of data. Message mode transmits a partial or full line of data. Received and keyed commands execute carriage return, line feed, erase functions, keyboard lock/unlock, etc. An operator-selectable roll function is provided. Data is rolled off the screen as it is keyed or received, after the last line is filled. Automatic line feed on carriage return is also an operator-selectable feature.

Cursor controls are provided that move the cursor up, down, left, right, and home. Cursor addressing and sensing are standard features. Either of two cursor addressing schemes can be used: an Escape sequence containing a cursor coordinate code, or the ADDS Consul 580 command sequence containing the row or column at the cursor location. Format protection is also a standard feature. Format protection restricts data entry to unprotected fields. Either unprotected fields or the entire form can be transmitted or transferred to an auxiliary device. Print-only and constant fields can be embedded in the screen format to control a printer or transmit special codes in the data stream. Protected or unprotected fields can be highlighted by reverse video, half- and full-intensity, blinking, and underlining. Fields can also be designated for non-display of data. Standard editing features include line and page erasure, character overwrite, backspace, and forward and backward tab. Character and line insert and delete functions are optional. Eight program function keys are standard for execution of program-defined functions. Terminal status information, such as terminal mode (on/off-line), auxiliary port enabled/ disabled, and communications line status, is displayed on the screen's 25th line. A self-diagnostic firmware routine performs a diagnostic check each time the terminal powers up; the results are displayed in the status line. The host processor can interrogate the Regent 200 for the current cursor address and memory contents (or value) at the cursor location. ▶

ADDS Regent Display Terminals

COMPONENTS

CRT DISPLAY UNIT: All models are equipped with a 12" (diagonally measured) display screen. Display capacity is 1920 characters in a 24-line by 80-column format. A 25th line displays status information. Characters are formed by utilizing a 5 x 8 dot matrix (Regent 20 and 25) or an 8 x 8 dot matrix (all others). The display presentation is dark characters on a light background, or light characters on a dark background for reverse video. A 96-character ASCII set plus 32 ASCII control codes can be displayed. An 11 symbol line drawing set is available on all models except the Regent 20 and 25. Refresh rate is 60 frames per second (50 frames per second for export model).

KEYBOARDS: All models feature a typewriter-style keyboard.

Regent 20: a 59-key keyboard with typamatic keys. Seven national character sets are resident: U.S., U.K., Danish/Norwegian, Swedish/Finnish, German, French, and Spanish.

Regent 25: a 76-key keyboard with typamatic keys. A separate 18-key array contains an ANSI standard numeric pad layout, cursor control keys, and comma and Enter keys. The national character sets resident in the Regent 20 are also resident in the Regent 25.

Regent 40: an 87-key keyboard (most are typamatic keys). Includes a 14-key numeric pad, eight pre-programmed function keys, five cursor control keys, and an auxiliary port control key.

Regent 60: a 101-key keyboard (most are typamatic keys). Includes a 14-key numeric pad, eight pre-programmed function keys, five cursor control keys, and a total of 14 keys for editing, selection of transmission mode, and Print Local.

Regent 100 and 200: A typewriter-style keyboard that can generate any of 128 ASCII character codes. All keys feature repeat action. A 14-key numeric pad is standard for both models. Eight program function keys, five cursor control keys, and an auxiliary interface key are standard on the Regent 200 and optional on the Regent 100. A separate edit keypad on the Regent 200 includes line and page erase, backspace, and optional character and line insert and delete keys. An attached keyboard is standard on both models; a detachable keyboard is available as an option.

PRICING

The ADDS Regent display terminals are available for purchase only. Quantity discounts are provided for end-user and OEM purchases. Maintenance service and installation are provided by TRW's Customer Service Division, which services Regent models only, or by General Electric's Apparatus Service Business Division. Installation is priced at $80 per terminal for terminals installed by GE; for GTE-supplied units, installation charges are determined on an individual basis with the nearest TRW field office. The investment tax credit is passed on to the customer for the purchased units only. ADDS does not provide any formal training on its terminals.

ADDS warrants each terminal for a period of 90 days from the date of shipment. The warranty covers defects in material and workmanship under normal use and service. The warranty period is extended to two years under the ADDS Extended Warranty Options, which is available at a cost of $100 per terminal.

	Purchase Price
Regent 20	$ 695
Regent 25	1,095
Regent 25/1500	1,195
(Hazeltine 1500 emulation)	
Regent 25/120	950
(Soroc IQ 120 emulation)	
Regent 25/P	1,195
(Microdata Prism emulation)	
Regent 40	1,300
Regent 42	1,480
Regent 40/VT	1,415
Regent 60	1,500
Regent 62	1,700
Regent 100	1,460
Regent 200	1,975
Detachable Keyboard	105■
(Regent 100 and 200 only)	

ADDS Alphanumeric Display Terminals

New Product Announcement

In October 1976, Applied Digital Data Systems (ADDS) announced a detachable keyboard option for its standard Consul product line and a new family member, the Consul 980B, designed as a comptible replacement for the Burroughs TD 700 and 800 series display terminals.

The new "D Series" Consul models are equipped with a detachable keyboard that can be located up to two feet from the display unit for operator convenience. The D series terminals re functionally identical with the Consul models that feature integral keyboards, and are priced about $25 more than their integral keyboard equivalents.

The Consul 980B provides complete compatibility with the Burroughs display terminals, and features several enhancements, including:

- Graphics.

- Security keylock.

- Program Attention keys.

- Program Function keys.

- Separate function keypad.

- Separate numeric keypad (convertible to user-programmable function keypad).

- A parallel and serial peripheral interface.

- Speeds up to 9600 bps.

Initial production deliveries of the new Consul 980B are scheduled for January 1977. Single-unit prices are $3,200, or $112 per month under a three-year lease including maintenance. Quantity discounts are available. Installation is priced at $80. □

ADDS Alphanumeric
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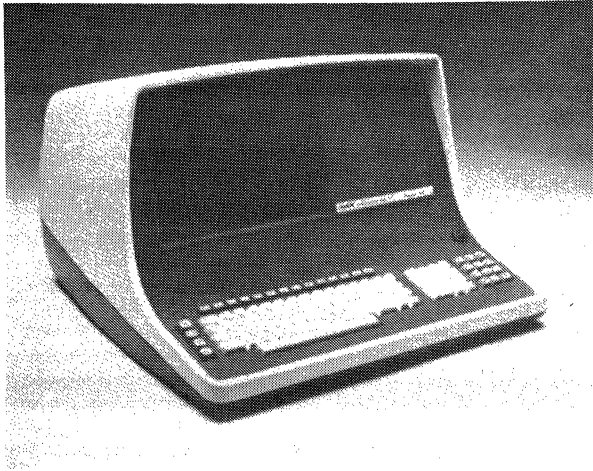
The Regent 200, one of the newer members of the ADDS Display Terminal family, features microprocessor-based controls.

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

Most models are Teletype-compatible; Burroughs TD 700/800 and IBM 3275 compatibility are also supported.

Standard features included in the various models are formatted data entry, extensive editing, selectable transmission rates, color display, and limited graphics. The newer models are microprocessor-controlled.

Single-unit prices range from $995 to $2,350 on an OEM basis and from $1,195 to $2,800 on an end-user basis. Quantity and institutional discounts are available.

Rental agreements under terms ranging from seven months to three years, including maintenance, are available to end users through General Electric.

MANAGEMENT SUMMARY

The ADDS terminals have become one of the more prominent display terminal families on the market. Founded in 1969, ADDS became profitable in mid-1972, and has remained profitable ever since; its 1977 revenues were $33.2 million, an increase of 86% over 1975 revenues, and its net income $5.3 million. ADDS sells primarily to the OEM market, which accounts for over 70 percent of its sales. Sales are also directed to end-users on a purchase-only basis; no lease plans are available through ADDS.

In September 1973, ADDS signed a three-year OEM contract valued at over $10 million with NCR, which switched from Sanders after a six-year OEM arrangement. The NCR arrangement has been extended by a second three-year contract and accounts for about 33 percent of the company's sales.

In May 1976, ADDS inked an OEM agreement with General Electric for the purchase of ADDS terminals which GE rents to end users under terms ranging from seven months to three years. All rental contracts include maintenance service provided by GE. The agreement called for an initial purchase of 500 ADDS terminals, with an estimated value of $750,000. ADDS has a similar agreement with GTE telephone operating companies.

In late 1977, ADDS contracted with TRW to provide installation and maintenance service on Regent models. General Electric also provides service on a third-party basis for most ADDS terminals. NCR and GTE service only the units they supply.

ADDS' display terminals are grouped into four product lines: ▷

CHARACTERISTICS

VENDOR: Applied Digital Data Systems (ADDS), Inc., 100 Marcus Boulevard, Hauppauge, New York 11787. Telephone (516) 231-5400.

DATE OF ANNOUNCEMENT: Information not available.

DATE OF FIRST DELIVERY: Consul 520—April 1976; Consul 580—September 1973; Consul 920—November 1974; Consul 980—November 1974; Consul 980A—June 1975; Envoy 620—October 1975; MRD 380—March 1974; MRD 980—April 1975; MRD 400—October 1975; Consul 980B—January 1977; Regent 100 and 200—November 1977.

NUMBER DELIVERED TO DATE: Over 100,000.

SERVICED BY: ADDS, TRW, NCR, GTE, or General Electric.

MODELS

The ADDS product line of display terminals includes four terminal families consisting of an aggregate of twelve models.

The *Consul Series* are stand-alone display terminals with attached or detachable keyboards; models include the Consul 520, 580, 920, 980, 980A, and 980B.

The *MRD Series* are rack-mounted versions of the Consul Series and consist of three components: controller (rack mounted), keyboard, and display monitor. The MRD Series are designed for a standard 19-inch equipment rack and include MRD Series 380 (Consul 580), 400, and 980 (Consul 980). The Consul 980 and MRD 980 are available with a peripherals interface to accommodating a user-supplied printer, cassette tape or diskette drive. The interface can be specified as paralleled (TTL) or serial (RS-232C). The MRD 400 Series are full-color displays with a standard paralleled (TTL) interface; a serial interface is optional. ▶

ADDS Alphanumeric
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▷ ● Consul—stand-alone, desk-top terminals with integral or detachable keyboards.

● MRD—stand-alone, rack-mounted terminals composed of a rack-mounted controller, a 12- or 15-inch CRT monitor, and an optional and separate keyboard.

● Envoy—stand-alone, portable display terminals contained in a briefcase for hand carrying.

● Regent—stand-alone, desk-top terminals with integral or detachable keyboards and microprocessor-based controls.

The Consul line currently consists of six models: four Teletype-compatible terminals, one IBM 3275 compatible terminal, and one Burroughs TD 700/800 compatible terminal. The Teletype-compatible family ranges from the basic 520 to the sophisticated 980. All members of this family are identical in appearance and display capacity (1920 characters), but each offers additional features over the preceding model. Key features include character or block transmission, switch selectable transmission rates up to 9600 bps, protected format, extensive editing and cursor control, cursor addressability/readability, limited graphics, numeric keypad, an attached or detachable keyboard, and auxiliary serial or parallel interfaces for attaching user-supplied printers and cassette or diskette drives. The Consul 980A is an IBM 3275-compatible version of the Consul 980 that offers a few enhancements over the IBM model. The key enhancements include three data entry modes, limited graphics capability, and extensive editing. Hard-copy output is optional via one of three printer models. The 980A is transmission compatible with IBM BSC protocol. The Consul 980B features Burroughs TD 700/800 compatibility. Enhancements of the 980B over the Burroughs units include program attention and program function keys, a separate function keypad, and limited graphics. All Consul models are geared to ASCII code and feature a full ASCII (128 characters) keyboard. Detachable keyboards are available on all Consul models.

The MRD rack-mounted line currently consists of four models, two of which, the MRD 380 and 980, are identical in operation and performance to Consul Models 580 and 980, respectively. The other two models, MRD 450 and 460, are designed for color display and have no Consul counterparts. The MRD 400 series are low-priced color display terminals that can display any of eight colors and feature format protection for data entry and a limited graphics capability for display of charted information and block diagrams. These models have a standard parallel interface for integration into a computer or terminal system, but do offer an optional serial interface for data communications. The MRD 400 Series are available with a 14-, 19-, or 25-inch color CRT monitor. Models 450 and 460 differ in display arrangement only. ▷

▶ The *Envoy 620* is a portable display terminal contained in a standard briefcase enclosure that measures 18 inches wide by 15 inches deep by 5 inches high and weighs 29 pounds.

The *Regent Series* are stand-alone Teletype-compatible terminals with a choice of integrated or detachable keyboards. Two microprocessor-based (Intel 8085) models are available: Regent 100 and Regent 200. The Regent 200 provides additional features over the Regent 100, including an auxiliary I/O RS-232C interface, an option on the Regent 100.

TRANSMISSION SPECIFICATIONS

All models except MRD 400, Consul 980A, and Consul 980B: Transmission is asynchronous half- or full-duplex (switch-selectable) at transmission rates up to 9600 bits/second. The 8-level ASCII transmission code is used. The code structure at 110 bits/second is 11 bits/character and includes one start bit and two stop bits. At all other speeds, the code structure is 10 bits/character, including one start and one stop bit. Odd or even parity, spacing, or marking is switch-selectable.

The switch-selectable transmission rates for each of the models are 110, 300, 1200, 2400, and 9600 bits/second. The Envoy 620 also contains a Bell System 103-compatible acoustic coupler that operates at switch selected rates of 110 or 300 bps.

The communications interface can be specified as an EIA RS-232C or 20 ma dc current loop interface.

Consul 980A: Transmission is half duplex, synchronous at rates up to 9600 bits/second. The 8-level ASCII (including odd parity) transmission code is used. Communications protocol is compatible with the IBM Binary Synchronous Communications (BSC) discipline. The communications interface conforms to EIA Standard RS-232C. The Consul 980A is transmission-compatible with the BSC version of the IBM 3275.

Consul 980B: Transmission is half-duplex, synchronous or asynchronous at rates up to 9600 bits/second. The 8-level ASCII transmission code is used. Odd or even parity, spacing, or marking is switch-selectable. Communications protocol is compatible with standard Burroughs multipoint polling and addressing discipline. The communications interface conforms to EIA Standard RS-232C. The Consul 980B is transmission-compatible with the Burroughs TD 700/800 Series terminals.

MRD 400 Series: A serial interface is optional and can include the RS 232C or 20 ma dc current loop interface. Rates are switch selectable at 150, 300, 6n0, 1200, 2400, 4800, or 9600 bits/second. Transmission is half- or full-duplex (switch-selectable) and provides Teletype compatibility. The standard parallel interface (TTL) supports data transfer at rates up to 1500 characters per second.

DEVICE CONTROL

Consul 520/Envoy 620: Transmission is performed on a character-by-character basis. Remote commands execute carriage return, line feed, screen erase, cursor control, and keyboard lock/unlock functions. Cursor functions include up, down, left, right, and home. A roll function causes data to roll off the screen as it is received or entered. An auto line feed function causes an automatic line feed for each carriage return.

Consul 580/MRD 380: Same as Consul 520, but also includes keyboard cursor controls and executes printer commands to switch on and off an attached printer. ▶

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▷ The Envoy line currently consists of one model (the 620) that contains a 5-inch CRT screen with a 1920-character capacity. Its hinged, full-ASCII keyboard includes a separate cluster of cursor control keys. The 620 can be used with an ordinary telephone via its integral acoustic coupler or a modem via its serial interface at switch-selectable speeds up to 9600 bps. A current loop interface is also available for Teletype compatibility. For hard-copy output, a user supplied printer can be attached to its standard serial printer interface.

The Regent line currently consists of two models: the Regent 100, a basic unit designed as a Teletype replacement; and the Regent 200, an enhanced model designed for data entry applications. The terminals have the same physical appearance, and feature a 12-inch screen with a 1920-character display capacity and a repeating keyboard with a separate numeric pad. The keyboard generates a 128-character ASCII set plus eleven graphic symbols; all generated characters can be represented on the display screen. Self-diagnostic firmware, a key feature, performs automatic diagnostic checking each time the terminal is powered up and displays the test results within the 25th line on the screen, which is designated as the status line. Using the highlighting features, selected fields can be displayed half- or full-intensity, reverse video (black symbols on white), blinked, or underlined; selected fields can also be blanked (not displayed) for security purposes. Two cursor addressing schemes are available, one using an Escape sequence, and the other using an ADDS Consul 580-compatible command sequence. Individual cursor control keys, eight program function keys, and an auxiliary I/O device are standard on the Regent 200 and optional on the Regent 100. Format generation and protection (standard), and character and line insertion and deletion (optional) are available only on the Regent 200. Transmission is asynchronous at switch-selectable speeds from 75 to 19,200 bits/second. General Electric TermiNet Series printers are available from ADDS for use as a hard-copy device.

In February 1976, ADDS introduced a programmable display terminal designed for data entry applications. Called System 70, the terminal features diskette storage and printed output. System 70 is described in Report C21-026-101.

USER REACTION

In Datapro's 1978 survey of alphanumeric display terminal users, 10 users reported on their experience with a total of 73 ADDS units. In addition, Datapro conducted recent telephone interviews with five additional users with 25 units of models not represented in the survey. The combined ratings are summarized below:

▶ *Consul 920:* Provides three operating modes: Conversational, Message, and Page. Conversational mode transmits a character for each key depression. Page mode transmits a full page of data. Message mode transmits a line at a time; a special feature permits a partial page (message) to be transmitted. Cursor controls include up, down, left, right, and home. Tab and screen erase functions are also provided. The Look Ahead feature precludes transmitting blanks that follow data on any given line, thereby increasing throughput. Format protection restricts data entry to unprotected fields; protected fields are displayed at half intensity (gray). Fields can be made to blink, or highlighted using dual intensity. Only unprotected fields are transmitted. Remote commands can read the current cursor position, sound the audible alarm, position the cursor to any character position on the screen, and lock/unlock the keyboard.

Consul 980/MRD 980: The three operating modes are identical to the Consul 920. The Look Ahead and Protected Format features incorporated in the Consul 920 are also provided. Cursor controls, tab, and screen erase are identical with the Consul 920. Edit controls (not provided on the Consul 920) include character and line insertion and deletion. Fields can be highlighted by blinking, reverse video, or dual intensity, or blanked (non-displayed) for security purposes.

Printer controls include Print On/Off and Local Print. Print On transfers all transmitted or received data to the peripheral interface; the Print Off function precludes this. The Local Print function transfers displayed data to the peripheral interfaces.

Remote commands execute the same function as on the Consul 920 but also include the Local Print function.

Consul 980A and 980B: The 980A and 980B are designed to be transmission-compatible with the IBM 3275 and Burroughs TD 700/800 Series terminals, respectively. How- ▶

This MRD Series 980 is designed for a standard 19-inch equipment rack and has three components: a 12-inch 1920-character monitor, a Teletypewriter-style keyboard with a numeric cluster and control ▷ pad, and the controller.

	Excellent	Good	Fair	Poor	WA*
Overall performance	7	7	0	0	3.5
Ease of operation	9	6	0	0	3.6

	Excellent	Good	Fair	Poor	WA*
Display clarity	6	9	0	0	3.4
Keyboard feel and usability	6	8	1	0	3.3
Hardware reliability	9	4	1	1	3.4
Maintenance service	8	6	0	0	3.6
Technical support	2	4	2	1	2.8

*Weighted Average on a scale of 4.0 for Excellent.

Not all respondents rated all characteristics, which accounts for the difference in the number of responses.

Key advantages cited by these users included reliability, flexibility, suitability for their application, and low cost.

The users mentioned no prominent disadvantages. However, five users, all of whom had had their units for three to six months, experienced hardware problems. One of these had traded in older ADDS models on newer units and had experienced a "high infant mortality" rate with both purchases; his experience was that after an initial break-in period of about six months, during which repairs or replacements were required, the units were highly reliable.

Two users felt that the keyboard had an awkward feel to professional typists, in that more pressure is required to depress the terminal's keys than those on a standard electric typewriter.

Most of the users were highly satisfied with their ADDS terminals. Several we talked to were repeat customers who felt that both the equipment, and the company in general, were a pleasure to deal with.☐

▶ ever, because each offers features not available on the IBM or Burroughs units, they are not plug-for-plug replacements. Users must modify their IBM 3270 or Burroughs applications software to integrate the 980A or 980B into their systems. Features on the 980A not available on the IBM 3275 include the blinking field designation and graphics. Features on the 980B not available on the Burroughs TD 700/800 Series terminals include program attention and program function keys, a separate function keypad, and graphics. Device controls for the 980A and 980B are identical.

Three operating modes include: Page, Message, and Off Line. The Page mode transmits a full page of displayed data. The Message mode transmits a single line or a partial page. The Off Line mode provides local operation with the terminal disconnected from the line.

Cursor controls include left, right, up, down, and home. Edit functions include character and line insertion and deletion. A local print function prints displayed data. The Protected Format feature displays protected fields at half intensity and unprotected fields at full intensity. Fields can also be made to blink, shown in reverse video, or blanked for security purposes. Only unprotected fields are transmitted and/or erased. The graphics feature displays graphic data within a 11,520 dot matrix.

Program Function (PF) and Program Attention (PA) controls are also provided. These controls transmit user-defined codes to the host computer.

MRD 400: Color control movements execute the selection of any of eight colors for character and background for each display position. Both parameters are independently selectable. Format protection precludes entry into protected fields.

Protected fields are displayed on an orange background; any of eight colors can be selected for the displayed data. All fields can be made to blink or highlighted using dual intensity. Only unprotected fields are transmitted and/or erased. Cursor addressibility positions the cursor to any display position on the screen. Tabbing moves the cursor between unprotected fields. A graphic feature displays annotated graphic data via a dot matrix.

Regent 100: Transmission is performed on a character-by-character basis as each character is keyed. Received and keyed commands execute carriage return, line feed, screen erase, cursor positioning, and keyboard lock/unlock functions. The cursor is addressable using either of two schemes: an Escape sequence containing a cursor coordinate code, or the ADDS Consul 580 command sequence containing the cursor location. Highlighting features include dual intensity, blanking, reverse video, blinking and underline. An operator-selectable roll function is provided. Data is rolled off the screen as it is keyed or entered after the last line is filled. Automatic line feed on carriage return is also an operator-selectable feature. An option package provides five discrete cursor control keys and eight program-defined function keys. The optional cursor control keys move the cursor up, down, left, right, and home. Terminal status information, such as terminal mode (on-/off-line), auxiliary port enabled/disabled, and communications line status, is displayed on the 25th line of the screen. A self-diagnostic firmware routine performs a diagnostic check each time the terminal powers up; the results are displayed in the status line. The host processor can interrogate the Regent 100 for the current cursor address and memory contents (or value) at the cursor location.

Regent 200: Three operating modes are provided: Conversational, Message, and Page. Conversational mode transmits a character for each key depression. Page mode transmits a full or partial page of data. Message mode transmits a partial or full line of data. Received and keyed commands execute carriage return, line feed, erase functions, keyboard lock/unlock, etc. An operator-selectable roll function is provided. Data is rolled off the screen as it is keyed or received, after the last line is filled. Automatic line feed on carriage return is also an operator-selectable feature.

Cursor controls are provided that move the cursor up, down, left, right, and home. Cursor addressing and sensing are standard features. Either of two cursor addressing schemes can be used: an Escape sequence containing a cursor coordinate code, or the ADDS Consul 580 command sequence containing the row or column at the cursor location. Format protection is also a standard feature. Format protection restricts data entry to unprotected fields. Either unprotected fields or the entire form can be transmitted or transferred to an auxiliary device. Print-only and constant fields can be embedded in the screen format to control a printer or transmit special codes in the data stream. Protected or unprotected fields can be highlighted by reverse video, half- and full-intensity, blinking, and underlining. Fields can also be designated for non-display of data. Standard editing features include line and page erasure, character overwrite, backspace, and forward and backward tab. Character and line insert and delete functions are optional. Eight program function keys are standard for execution of program-defined functions. Terminal status information, such as terminal mode (on/off-line), auxiliary port enabled/ disabled, and communications line status, is displayed on the screen's 25th line. A self-diagnostic firmware routine performs a diagnostic check each time the terminal powers up; the results are displayed in the status line. The host processor can interrogate the Regent 200 for the current cursor address and memory contents (or value) at the cursor location.

COMPONENTS

CRT Display Unit (all models except Regent Series and MRD 400 Series: A 12-inch (diagonal measurement) CRT ▶

▶ with a viewing area 9 inches wide by 6 inches high. The Envoy 620 contains a 5-inch CRT with a viewing area 3 inches wide by 2 inches high. The display arrangement for all models is 24 lines of 80 character each to total 1920 characters. Consul Models 520 and 580, the MRD 380, and Envoy 620 each display a character set of 64 symbols. Consul Models 920, 980, 980A, and 980B and the MRD 980 each display a character set of 96 symbols including upper and lower case alphabetics, numerics, and specials plus any of 32 ASCII control codes.

Each character is formed within a 5-by-7 dot matrix. Data is displayed in black (reverse video). The Consul 980, 980A, and 980B, and MRD 980 each display graphic data via an addressable matrix of 11,520 elements. The matrix arrangement is 72 vertical by 160 horizontal dots.

CRT Display Unit for Regent Series: A 12-inch (diagonal measurement) CRT with a display arrangement of 24 lines of 80 characters each, for a total display capacity of 1920 characters. The character set consists of 128 displayable symbols including upper and lower case alphabetics, numerics, specials, and representative symbols for ASCII control codes. The line drawing character set consists of 11 special graphic symbols. Each character is formed via an 8-by-8 dot matrix. Data is displayed in white (P4 phosphor). Highlighting features include dual intensity, blanking, reverse video, blinking, and underline.

CRT Display Unit for MRD 400 Series: The display arrangement is 32 lines of 80 characters each for the MRD 450 and 24 lines of 80 characters each for the MRD 460. A set of 64 characters including upper case alphabetics, numerics, and specials is displayed in color. Eight colors include blue, green, red, yellow, magenta, cyan, black, and white. Each character is formed within a 5-by-7 dot matrix. The cursor is a blinking, 6-dot orange underscore. Graphic display is implemented via an addressable matrix of 11,520 elements. The matrix arrangement is 72 vertical by 160 horizontal dots.

Consul 520 Keyboard: 58-key, Teletypewriter-style keyboard. Key functions include screen erase, new line, break, repeat, rub out, line feed, auto line feed, carriage return, roll, full duplex, escape, shift, and control shift. The keyboard can generate any of 128 ASCII character codes. An attached keyboard is standard; a detachable keyboard is available as an option.

Consul 580 and MRD 380 Keyboards: Same as the Consul 520 keyboard but also includes an integral 11-key numeric pad with decimal point and a 13-key cluster of cursor control (up, down, left, right, and home), print on and off, and user-specified keys. The numeric pad and function key cluster are located to the right of the main keygroup. The keyboards can generate any of 128 ASCII character codes. A detachable keyboard is standard on the MRD 380 and optional on the Consul 580.

Consul 920, 980 and MRD 980 Keyboards: Same as Consul 520 keyboard but also includes an integral 12-key numeric pad (including decimal point and tab) and a 15-key cluster of cursor control, (up, down, left, right and home) printer (on, off, local) and edit control (character & line insert and delete) keys, both clusters are located to the right of the main keygroup. The keyboard can generate any of 128 ASCII character codes. An attached keyboard is standard on the Consul 920 and 980; a detachable keyboard is available. The MRD 980 keyboard is detached.

MRD 400 Series Keyboard (optional): A Teletype compatible key arrangement that includes 5 cursor control keys. The keyboard can generate any of 128 ASCII character codes.

Envoy 620 Keyboard: Same as Consul 520 keyboard but also includes an integral 13-key cluster of cursor and print controls keys. The keyboard can generate any of 128 ASCII character codes.

Consul 980A and 980B Keyboards: A 56-key typewriter style keyboard. A 12-key numeric pad (including decimal point and tab) and a 15-key cluster of function keys are located to the right of the main keygroup. The cluster of function keys include cursor control, edit, print, and two PA keys. The keys in the numeric pad also serve as PF and PA keys where used in conjunction with Control and Shift keys. A security keylock is provided. An attached keyboard is standard; a detachable keyboard is available as an option.

Regent Keyboards: A typewriter-style keyboard that can generate any of 128 ASCII character codes. All keys feature repeat action. A 14-key numeric pad is standard for both models. Eight program function keys, five cursor control keys, and an auxiliary interface key are standard on the Regent 200 and optional on the Regent 100. A separate edit keypad on the Regent 200 includes line and page erase, backspace, and optional character and line insert and delete keys. An attached keyboard is standard on both models; a detachable keyboard is available as an option.

Printers (Consul 980A only): three printer models are available for the Consul 980A. Model 805P is an NCR 260-1 thermal printer with 80 print positions and a rated speed of 30 cps. Models 910 and 915 have 80 or 132 positions and a rated speed of 165 cps; they are Centronics Models 101A and 306, respectively.

PRICING

The ADDS Teletype-compatible display terminals are available for purchase only. Quantity discounts are provided for end-user and OEM purchases. Maintenance service and installation are provided by TRW's Customer Service Division, which services Regent models only, or by General Electric's Apparatus Service Business Division. GTE and NCR provide installation and maintenance service for ADDS terminals they supply. Installation is priced at $80 per terminal for terminals installed by GE; for GTE- and TRW-supplied units, installation charges are determined on an individual basis with the nearest GTE or TRW field office. The investment tax credit is passed on to the customer for the purchased units only. ADDS does not provide any formal training on its terminals.

ADDS warrants each terminal for a period of 90 days from the date of shipment. The warranty covers defects in material and workmanship under normal use and service. The warranty period is extended to two years under the ADDS Extended Warranty Options, which is available at a cost of $100 per terminal.

Special prices for ADDS terminals are available for institutions. For example, under the educational discount, the Regent 100 sells for $1,150 and the Regent 200 sells for $1,650.

General Electric offers the ADDS terminals on a 7 to 11 month, 1-, 2-, or 3-year lease only. Lease terms include maintenance. The ADDS terminals are available from GE through the Instrumentation and Communication Equipment Service Service Department of GE's Apparatus Service Business Division. ▶

ADDS Alphanumeric
Display Terminals

	OEM Purchase (per unit)				End-User Purchase (per unit)				
	1-9	10-24	25-49	50-99	1-4	5-9	10-24	25-49	50-99
Consul Series									
520	$1,295	$1,295	$1,195	$1,095	$1,595	$1,500	$1,425	$1,340	$1,220
580	1,495	1,495	1,445	1,395	1,795	1,695	1,625	1,565	1,500
920	1,895	1,895	1,695	1,575	2,200	2,200	2,200	2,050	1,895
980	2,350	2,350	1,995	1,845	2,800	2,800	2,800	2,575	2,575
980A	2,495	2,495	2,375	2,250	2,700	2,700	2,700	2,595	2,475
980B	2,495	2,495	2,375	2,250	2,700	2,700	2,700	2,595	2,475
Detachable Keyboard	50	50	50	50	50	50	50	50	50
MRD Series									
380	995	995	965	935	1,195	1,110	1,075	1,030	975
450	3,600	3,400	3,200	3,000	4,200	4,200	3,800	3,550	3,300
460	3,200	3,000	2,850	2,700	3,800	3,800	3,600	3,200	3,000
980	1,595	1,595	1,375	1,275	1,995	1,995	1,995	1,795	1,795
Keyboard	325	325	325	325	325	325	325	325	325
12-inch Monitor (380/980 only)	365	365	365	365	365	365	365	365	365
19-inch Monitor (450/460 only)	2,900	2,900	2,900	2,900	2,900	2,900	2,900	2,900	2,900
25-inch Monitor (450/460 only)	3,100	3,100	3,100	3,100	3,100	3,100	3,100	3,100	3,100
Serial Interface (450/460 only)	100	100	100	100	100	100	100	100	100
Envoy 620	2,050	2,050	1,925	1,825	2,250	2,250	2,250	2,100	2,100
Regent Series									
100	1,125	1,125	1,025	995	1,325	1,285	1,190	1,150	1,095
200	1,495	1,495	1,380	1,275	1,795	1,760	1,725	1,650	1,525
Edit Option Package (100 only)	60	60	60	60	125	125	125	125	125
Edit Option Package (200 only)	75	75	75	75	145	145	145	145	145
Detachable Keyboard	50	50	50	50	95	95	95	95	95

PRINTERS

	Monthly Charge*			
	2-Year Lease	3-Year Lease	Purchase	Monthly Maint.
Printers:				
805P, 80-col. thermal	$106	$ 81	$1,995	$11
910, 80-col., 165 cps	160	132	2,550	42
915, 132-col., 165 cps	207	160	3,500	42
Printer Options:				
Lower case	25	16	500	0
Stand	10	6	200	0
220 volts/50Hz operation	5	3	100	0

*Includes prime-shift maintenance.

GENERAL ELECTRIC ASBD PRICES

|		Monthly Charge*			
	7-11 Months	1-Year Lease	2-Year Lease	3-Year Lease	Monthly Maint.**
Consul 980	$162	$137	$120	$110	$20
Consul 980 A/B	***	***	***	***	***
Consul 920	125	96	84	77	20
Consul 580	105	91	78	72	20
Consul 520	90	75	70	65	18
Envoy 620	175	145	137	115	22
Regent 100	***	69	65	60	18
Regent 200	***	85	80	75	20
MRD 980:					
Monitor	—	105	95	88	20
Keyboard	—	25	24	22	20
MRD 380:					
Monitor	—	78	70	65	20
Keyboard	—	25	24	22	20
Monitors:					
TE 9M (9 in.)	—	20	19	17	6
TE 12M (12 in.)	—	22	26	24	6
TU 14M (14 in.)	—	41	39	35	6
TU 23M (23 in.)	—	44	42	40	6

*Includes prime-shift maintenance for service within a 25-mile radius of a GE service center.
**For existing ADDS equipment; i.e., not GE leased.
***Priced via special quote only.

GE ASBD charges $80 per terminal for installation and $45 or $65 per terminal for de-installation of terminals installed for over or less than one year, respectively.■

ADDS Alphanumeric Display Terminals
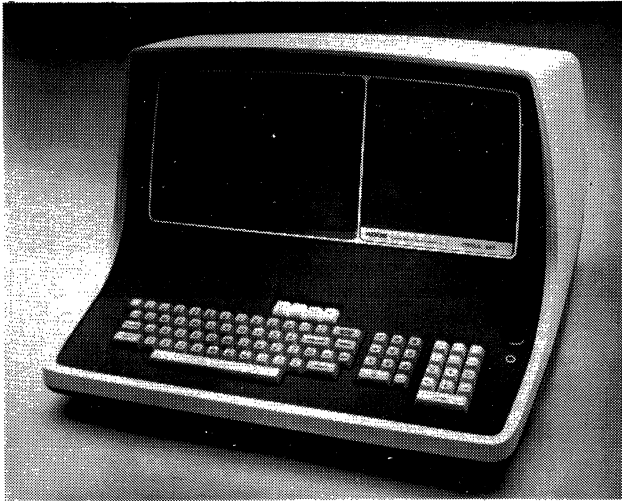
The Consul 580 has the same attractive appearance as the other Consul models. A mid-family member, the Consul 580 features a numeric pad, function key cluster with separate cursor controls, and accommodates a user-supplied printer or cassette tape unit.

MANAGEMENT SUMMARY

Founded in 1969, ADDS has become one of the more prominent vendors of alphanumeric display terminals. Since its inception, ADDS has directed its market thrust to the Teletype replacement market, but in June 1975, it diverted some of that thrust to the IBM 3270 replacement market with the unveiling of an IBM 3275-compatible terminal. ADDS sells primarily to the OEM market, which accounts for over 70 percent of its sales. Sales are also directed to end users, but its products, except for a portable terminal and the 3275 replacement, are sold outright; no lease plan is available. Quantity discounts are offered to both OEM and end users. ADDS became profitable in mid 1972 and has remained profitable since; its 1975 revenues were $17.8 million and its net income $3.2 million.

In September 1973, ADDS signed a three-year OEM contract valued at over $10 million with NCR, which switched from Sanders after a six-year OEM arrangement. The NCR arrangement has been extended by a second three-year contract and accounts for about 42 percent of the company's sales. NCR has purchased an equity position in ADDS amounting to 7 percent of the company's common stock. Since March 1974, ADDS has had a service agreement with NCR to provide service for its terminals on a national basis through NCR service personnel.

In May 1976, ADDS inked an OEM agreement with General Electric for the purchase of ADDS terminals which GE rents to end users under terms ranging from seven months to three years. All rental contracts include maintenance service provided by GE. The agreement ▷

A low-cost family of Teletype-compatible CRT keyboard/display terminals plus a replacement for the IBM 3275.

Standard features included in the various models are formatted data entry, extensive editing, auxiliary device control, selectable transmission rates, color display, etc.

Configurations are stand-alone; they can support external user-supplied devices via an auxiliary serial interface. Rack-mounted models are also available.

Pricing (in unit quantities) ranges from $1,295 to $2,350 on an OEM basis and from $1,595 to $2,800 on an end-user basis for the Teletype-compatible desk-top terminals.

The ADDS Teletype-compatible terminals are available from General Electric on a lease basis only.

CHARACTERISTICS

VENDOR: Applied Digital Data Systems (ADDS), Inc., 100 Marcus Boulevard, Hauppauge, New York 11787. Telephone (516) 231-5400.

DATE OF ANNOUNCEMENT: Information not available.

DATE OF FIRST DELIVERY: Consul 520—April 1976; Consul 580—September 1973; Consul 920—November 1974; Consul 980—November 1974; Consul 980A—June 1975; Envoy 620—October 1975; MRD 380—March 1974; MRD 980—April 1975; MRD 400—October 1975.

NUMBER DELIVERED TO DATE: Over 25,000.

SERVICED BY: NCR, GTE, or General Electric.

MODELS

The ADDS product line of display terminals includes three terminal families consisting of an aggregate of eight models.

The *Consul Series* are stand-alone display terminals with integral keyboard; models include the Consul 520, 580, 920, 980, and 980A.

The *MRD Series* are rack-mounted versions of the Consul Series and consist of three components: controller (rack mounted), keyboard, and display monitor. The MRD Series are designed for a standard 19-inch equipment rack and include MRD Series 380 (Consul 580), 400, and 980 (Consul 980). The Consul 980 and MRD 980 are available with a peripherals interface to accommodating a user-supplied printer, cassette tape or diskette drive. The interface can be specified as paralleled (TTL) or serial (RS-232C). The MRD 400 Series are full-color displays with a standard paralleled (TTL) interface; a serial interface is optional. ▶

ADDS Alphanumeric Display Terminals

▷ called for an initial purchase of 500 ADDS terminals, with an estimated value of $750,000. ADDS has a similar agreement with GTE telephone operating companies. Modular Computer Systems (ModComp), another large OEM customer, switched its OEM CRT business from Beehive to ADDS in May 1974. ADDS also edged Beehive, Infoton, and Hazeltine out of a $500,000 contract with Microdata. ADDS' principal competitors are Hazeltine and Lear Siegler.

ADDS' display terminals are grouped into three product lines:

● Consul—stand-alone, desk-top terminals with integral keyboards.

● MRD—stand-alone, rack-mounted terminals composed of a rack-mounted controller, a 12- or 15-inch CRT monitor, and an optional and separate keyboard.

● Envoy—stand-alone, portable display terminals contained in a briefcase for hand carrying.

The Consul line currently consists of five models: four Teletype-compatible terminals, and one IBM 3275 compatible terminal. The Teletype-compatible family ranges from the basic 520 to the sophisticated 980. All members of this family are identical in appearance and display capacity (1920 characters), but each offers additional features over the preceding model. Key features include character or block transmission, switch selectable transmission rates up to 9600 bps, protected format, extensive editing and cursor control, cursor addressability/readability, limited graphics, numeric keypad, and auxiliary serial or parallel interfaces for attaching user-supplied printers and cassette or diskette drives. The Consul 980A is an IBM 3275-compatible version of the Consul 980 that offers a few enhancements over the IBM model. The key enhancements include three data entry modes, limited graphics capability, extensive editing, and a numeric keypad. Hard-copy output is optional via one of three printer models. The 980A is transmission compatible with IBM BSC protocol. All Consul models are geared to ASCII code and feature a full ASCII (128 characters) keyboard. Detachable keyboards will be available in November 1976.

The MRD rack mounted line currently consists of four models, two of which, the MRD 380 and 980, are identical in operation and performance to Consul Models 580 and 980, respectively. The other two models, MRD 450 and 460, are designed for color display and have no Consul counterparts. The MRD 400 series are low-priced color display terminals that can display any of eight colors and feature format protection for data entry and a limited graphics capability for display of charted information and block diagrams. These models have a standard parallel interface for integration into a computer or terminal system, but do offer an optional serial interface for data communications. The MRD 400 Series are available with a 14-, 19-, or 25-inch color CRT monitor. Models 450 and 460 differ in display arrangement only. ▷

▶ The *Envoy 620* is a portable display terminal contined with a standard brief-case enclosure that measures 18 inches wide by 15 inches deep by 5 inches high and weighs 29 pounds.

TRANSMISSION SPECIFICATIONS

All models except MRD 400 and Consul 980A: Transmission is half- or full-duplex (switch selectable) at transmission rates up to 9600 bits/second. The 8-level ASCII transmission code is used. The code structure at 110 bits/second is 11 bits/character and includes one start bit and two stop bits. At all other speeds, the code structure is 10 bits/character, including one start and one stop bit.

The switch-selectable transmission rates for each of the models are 110, 300, 1200, 2400, and 9600 bits/second. The Envoy 620 also contains a Bell System 103-compatible acoustic coupler that operates at switch selected rates of 110 or 300 bps.

The communications interface can be specified as an EIA RS-232C or 20 ma dc current loop interface.

Consul 980A: Transmission is half duplex, synchronous at rates up to 9600 bits/second. The 8-level ASCII (including odd parity) transmission code is used. Communications protocol is compatible with the IBM Binary Synchronous Communications (BSC) discipline. The communications interface conforms to EIA Standard RS-232C. The Consul 980A is transmission compatible with the BSC version of the IBM 3275.

MRD 400 Series: A serial interface is optional and can include the RS 232C or 20 ma dc current loop interface. Rates are switch selectable at 150, 300, 600, 1200, 2400, 4800, or 9600 bits/second. Transmission is half- or full-duplex (switch selectable) and provides Teletype compatibility. The standard parallel interface (TTL) supports data transfer at rates up to 1500 characters per second.

DEVICE CONTROL

Consul 520 and Envoy 620: Transmission is performed on a character-by-character basis. Remote commands execute carriage return, line feed, screen erase, cursor control, and keyboard lock/unlock functions. Cursor functions include up, down, left, right, and home. A roll function causes data to roll off the screen as it is received or entered. An auto line feed function causes an automatic line feed for each carriage return.

Consul 580/MRD 380: Same as Consul 520, but also includes keyboard cursor controls and executes printer commands to switch on and off an attached printer.

Consul 920: Provides three operating modes: Conversational, Message, and Page. Conversational mode transmits a character for each key depression. Page mode transmits a full page of data. Message mode transmits a line at a time; a special feature permits a partial page (message) to be transmitted. Cursor controls include up, down, left, right, and home. Tab and screen erase functions are also provided. The Look Ahead feature precludes transmitting blanks that follow data on any given line, thereby increasing throughput. Format protection restricts data entry to unprotected fields; protected fields are displayed at half intensity (gray). Only unprotected fields are transmitted. Remote commands can read the current cursor position, sound the audible alarm, position the cursor to any character position on the screen, and lock/unlock the keyboard. ▶

ADDS Alphanumeric Display Terminals

▷ The Envoy line currently consists of one model that contains a 5-inch CRT screen with a 1920-character capacity. Its hinged, full-ASCII keyboard includes a separate cluster of cursor control keys. The 620 can be used with an ordinary telephone via its integral acoustic coupler or a modem via its serial interface at switch-selectable speeds up to 9600 bps. A current loop interface is also available for Teletype compatibility. For hard-copy output, a user supplied printer can be attached to its standard serial printer interface.

In February 1976, ADDS introduced a programmable display terminal designed for data entry applications. Called System 70, the terminal features diskette storage and printed output. System 70 is described in Report C21-026-101.

USER REACTION

In Datapro's 1976 survey of alphanumeric display terminal users, 6 users reported on their experience with a total of 24 ADDS display terminals. Their ratings are presented in the following table.

	Excellent	Good	Fair	Poor	WA*
Overall performance	5	1	0	0	3.8
Ease of operation	4	1	1	0	3.5
Display clarity	6	0	0	0	4.0
Keyboard feel & usability	5	1	0	0	3.8
Hardware reliability	4	2	0	0	3.7
Maintenance service	4	2	0	0	3.7
Software & technical support	4	2	0	0	3.7

*Weighted Average on a scale of 4.0 for Excellent.

These well satisfied users cited low cost, reliability, and applicability as key advantages of the ADDS terminals. One user cited inflexibility for his ADDS 500 while another cited performance limitations for his ADDS 880 as the only disadvantages. □

▶ *Consul 980/MRD 980:* The three operating modes are identical to the Consul 920. The Look Ahead and Protected Format features incorporated in the Consul 920 are also provided. Cursor controls, tab, and screen erase are identical with the Consul 920. Edit controls (not provided on the Consul 920) include character and line insertion and deletion.

Printer controls include Print On/Off and Local Print. Print On transfers all transmitted or received data to the peripheral interface; the Print Off function precludes this. The Local Print function transfers displayed data to the peripheral interfaces.

Remote commands execute the same functions as on the Consul 920 but also includes the Local Print function.

Consul 980A: Designed to serve as a direct replacement for the IBM 3275, the 980A is completely compatible with the addressing sequence, command code structure, and communications protocol employed by the BSC IBM 3270 Information Display System. The 980A responds to and executes the full repertoire of IBM 3275 commands. In addition, the 980A features some enhancements in local

operation that do not affect individual application programs.

Three operating modes include: Page, Message, and Off Line. The Page mode transmits a full page of displayed data. The Message mode transmits a single line or a partial page. The Off Line mode provides local operation with the terminal disconnected from the line.

Cursor controls include left, right, up, down, and home. Edit functions include character and line insertion and deletion. A local print function prints displayed data. The Protected Format feature displays protected fields at half intensity and unprotected fields at full intensity. Only unprotected fields are transmitted and/or erased. The graphics feature displays graphic data within a 11,520 dot matrix.

Program Function (PF) and Program Attention (PA) controls are also provided. These controls transmit user-defined codes to the host computer.

MRD 400: Color control movements execute the selection of any of eight colors for character and background for each display position. Both parameters are independently selectable. Format protection precludes entry into protected fields. Protected fields are displayed on an orange background; any of eight colors can be selected for the displayed data. All fields can be made to blink. Only unprotected fields are transmitted and/or erased. Cursor addressability positions the cursor to any display position on the screen. Tabbing moves the cursor between unprotected fields. A graphic feature displays annotated graphic data via a dot matrix.

COMPONENTS

CRT Display Unit (all models except MRD 400 Series): A 12-inch (diagonal measurement) CRT with a viewing area 9 inches wide by 6 inches high. The Envoy 620 contains a 5-inch CRT with a viewing area 3 inches wide by 2 inches high. The display arrangement for all models is 24 lines of 80 characters each to total 1920 characters. Consul Models 520 and 580, the MRD 380, and Envoy 620 each display a character set of 64 symbols. Consul Models 920, 980, and 980A and the MRD 980 each display a character set of 96 symbols including upper and lower case alphabetics, numerics, and specials plus any of 32 ASCII control codes. ▶

The Envoy 620 is a portable terminal that weighs just 29 pounds. Features include a 5-inch, 1920-character screen, a full ASCII keyboard with function keypad, and a 110- or 300-bps integral acoustic coupler.

ADDS Alphanumeric Display Terminals

▶ Each character is formed within a 5-by-7 dot matrix. Data is displayed in black (reverse video). The Consul 980 and MRD 980 each display graphic data via an addressable matrix of 11,520 elements. The matrix arrangement is 72 vertical by 160 horizontal dots.

MRD 400 Series: The display arrangement is 32 lines of 80 characters each for the MRD 450 and 24 lines of 80 characters each for the MRD 460. A set of 64 characters including upper case alphabetics, numerics, and specials is displayed in color. Eight colors include blue, green, red, yellow, magenta, cyan, black, and white. Each character is formed within a 5-by-7 dot matrix. The cursor is a blinking, 6-dot orange underscore. Graphic display is implemented via an addressable matrix of 11,520 elements. The matrix arrangement is 72 vertical by 160 horizontal dots.

Consul 520 Keyboard: 58-key, Teletypewriter-style attached keyboard. Key functions include screen erase, new line, break, repeat, rub out, line feed, auto line feed, carriage return, roll, full duplex, escape, shift, and control shift. The keyboard can generate any of 128 ASCII character codes.

Consul 580 and MRD 380 Keyboards: Same as the Consul 520 keyboard but also includes an integral 11-key numeric pad with decimal point and a 13-key cluster of cursor control (up, down, left, right, and home), print on and off, and user-specified keys. The numeric pad and function key cluster are located to the right of the main keygroup. The keyboards can generate any of 128 ASCII character codes.

Consul 920, 980 and MRD 980 Keyboards: Same as Consul 520 keyboard but also includes an integral 12-key numeric pad (including decimal point and tab) and a 15-key cluster of cursor control, (up, down, left, right, and home) printer (on, off, local) and edit control (character & line insert and delete) keys, both clusters are located to the right of the main keygroup. The keyboard can generate any of 128 ASCII character codes.

MRD 400 Series Keyobard (optional): A Teletype compatible key arrangement that includes 5 cursor control keys. The keyboard can generate any of 128 ASCII character codes.

Envoy 620 Keyboard: Same as Consul 520 keyboard but also includes an integral 13-key cluster of cursor and print controls keys. The keyboard can generate any of 128 ASCII character codes.

Consul 980A Keyboard: A 56-key typewriter style attached keyboard. A 12-key numeric pad (including decimal point and tab) and a 15-key cluster of functions keys are located to the right of the main keygroup. The cluster of function keys include cursor control, edit, print, and two PA keys. The keys in the numeric pad also serve as PF and PA keys where used in conjunction with Control and Shift keys. A security keylock is provided.

Printers (Consul 980A only): Three printer models are available for the Consul 980A. Model 805P is an NCR 260-1 thermal printer with 80 print positions and a rated speed of 30 cps. Models 910 and 915, have 80 or 132 print positions and a rated speed of 165 cps; they are Centronics Models 101A and 306, respectively.

PRICING

The ADDS Teletype-compatible display terminals (except for the Envoy 620) are available for purchase only. Quantity discounts are provided. The Envoy 620 is available on a 3-year lease, including maintenance. The ADDS Consul 980A IBM 3275-compatible terminal is available for purchase or on a two- or three-year lease. Maintenance service and installation is provided by NCR or by General Electric or GTE for ADDS terminals supplied by those vendors. Installation is priced at $75 per terminal for terminals installed by NCR and $80 per terminal for those terminals installed by GE. The investment tax credit is passed on to the customer for purchased units only. ADDS does not provide any formal training on its terminals.

ADDS warrants each terminal for a period of 90 days from the date of shipment. The warranty covers defects in material and workmanship under normal use and service. The warranty period is extended to two years under the ADDS Extended Warranty Options, which is available at a cost of $100 per terminal.

Special prices for ADDS terminals are available for institutions.

General Electric offers the ADDS terminals on a 7 to 11 month, 1-, 2-, or 3-year lease only. Lease terms include maintenance. The ADDS terminals are available from GE through the Instrumentation and Communication Equipment Service Department of GE's Apparatus Service Business Division.

ADDS PRICES

Purchase Prices

OEM Purchase—	Consul 520	Consul 580	Consul 920	Consul 980	MRD 380	MRD 980	Envoy 620
1-24 units	$1,295	$1,495	$1,895	$2,350	$ 995	$1,595	$2,050
25-49 units	1,195	1,445	1,695	1,995	965	1,375	1,925
50-99 units	1,095	1,395	1,575	1,845	935	1,275	1,825
End-User Purchase—							
1-4 units	1,595	1,795	2,200	2,800	1,195	1,995	2,250
5-9 units	1,500	1,695	2,200	2,800	1,110	1,995	2,250
10-24 units	1,425	1,625	2,200	2,800	1,075	1,995	2,250
25-49 units	1,340	1,565	2,050	2,575	1,030	1,795	2,100
50-99 units	1,220	1,500	1,895	2,575	975	1,795	2,100

MRD 380 & 980 Options (OEM & end-user)—

Keyboard	$ 325
12-inch Monitor	365

ADDS Alphanumeric Display Terminals

OEM Purchase—	MRD 450	MRD 460
1-9 Controllers	$3,600	$3,200
10-24 Controllers	3,400	3,000
25-49 Controllers	3,200	2,850
50-99 Controllers	3,000	2,700
End-User Purchase—		
1-9 Controllers	$4,200	$3,800
10-24 Controllers	3,800	3,600
25-49 Controllers	3,550	3,200
50-99 Controllers	3,300	3,000

MRD 400 Series Options (OEM & End-User)—

Keyboard	$ 325
19-inch Monitor	2,900
25-inch Monitor	3,100
Serial Interface	100

	Monthly Charge*			
	2-Year Lease	3-Year Lease	Purchase	Monthly Maint.
Consul 980A	$157	$112	$3,200	$22
Printers:				
805P, 80-col. thermal	106	81	1,995	11
910, 80-col., 165 cps	160	132	2,550	42
915, 132-col., 165 cps	207	160	3,500	42
Printer Options:				
Lower case	25	16	500	0
Stand	10	6	200	0
220 volts/50Hz operation	5	3	100	0
Envoy 620	—	115	—	—

*Includes prime-shift maintenance.

GENERAL ELECTRIC ASBD PRICES

	Monthly Charge*				
	7-11 Months	1-Year Lease	2-Year Lease	3-Year Lease	Monthly Maint.**
Consul 980	$162	$137	$120	$110	$20
Consul 920	125	96	84	77	20
Consul 580	105	91	78	72	20
Consul 520	90	75	70	65	18
Envoy 620	175	145	137	115	22
MRD 980:					
Monitor	—	105	95	88	20
Keyboard	—	25	24	22	20
MRD 380:					
Monitor	—	78	70	65	20
Keyboard	—	25	24	22	20
Monitors:					
TE 9M (9 in.)	—	20	19	17	6
TE 12M (12 in.)	—	22	26	24	6
TU 14M (14 in.)	—	41	39	35	6
TU 23M (23 in.)	—	44	42	40	6

* Includes prime-shift maintenance for service within a 25-mile radius of a GE service center.

**For existing ADDS equipment; i.e., not GE leased.

NA—Not available.

GE ASBD charges $80 per terminal for installation and $45 or $65 per terminal for de-installation of terminals installed for over or less than one year, respectively. ■

ADDS Viewpoint Display Terminal

Ergonomic design features on the low-priced Viewpoint terminal include a detachable keyboard (with a separate cursor control/numeric/function keypad), and a tiltable display screen.

A low-priced ASCII display terminal.

The Viewpoint's full-sized (12" diagonally measured) screen has a display capacity of 1920 characters arranged in 24 lines of 80 characters each. The screen can also be tilted. The unit's keyboard is detachable, and features a typewriter-style layout and a separate cursor control/numeric keypad. Six international character fonts are switch-selectable.

The Viewpoint is priced at $650 for single quantity end users. The price is lower for high volume orders.

MANAGEMENT SUMMARY

ADDS' introduction of the Viewpoint, in March 1981, triggered a series of price cuts and new product introductions in the ASCII terminal marketplace. With a single quantity purchase price of $650, plus additional discounts for high volume orders, the Viewpoint was priced considerably lower than any comparable terminal on the market at that time. Since ADDS' announcement, most major competitors have either announced new models (such as the Hazeltine Esprit), or have slashed prices on existing models (such as Lear Siegler's ADM-3A and ADM-5 price reductions), in response to the ADDS unit.

Implementation of new technology enabled ADDS to introduce the Viewpoint. That new technology includes the use of a proprietary LSI (large scale integration) chip which has simplified the unit's physical and electronic design. The chip, manufactured to ADDS specifications by Standard Microsystems Corporation of Hauppauge, New York, is a video controller which works in conjunction with a Zilog Z8 microprocessor to translate incoming data from the host into signals that drive the CRT monitor and display characters on the screen. The chip enables the company to place the Viewpoint's entire logic electronics on a single circuit board containing 11 chips. The reduced parts count, coupled with lower assembly costs, enable ADDS to offer the Viewpoint at its low price.

The Viewpoint features a 12" display screen with two tilt positions. The screen can display up to 1920 characters in a 24-line by 80-column format. The unit's keyboard has a typewriter-style layout including a 14-key numeric/cursor control cluster. The keyboard is detachable and connected to the display via a stretch cord. Six international character sets, including U.K./Netherlands, ▷

CHARACTERISTICS

VENDOR: Applied Digital Data Systems (ADDS) Inc., 100 Marcus Boulevard, Hauppauge, NY 11787. Telephone (516) 231-5400.

DATE OF ANNOUNCEMENT: March 1981.

DATE OF FIRST DELIVERY: April 1981.

NUMBER DELIVERED TO DATE: Information not available.

SERVICED BY: ADDS.

MODELS

The Viewpoint is available in two models: Model A contains all of the standard features; Model B contains all of the standard features while also including a snap-on glare filter for the display screen.

TRANSMISSION SPECIFICATIONS

The Viewpoint provides for conversational (character by character) transmission in half- or full-duplex at speeds from 110 to 19,200 bits per second. An RS-232-C interface is standard, as is an auxiliary serial output interface. Odd, even, mark, or space parity is selectable.

DEVICE CONTROL

The Viewpoint transmits data character-by-character as it is keyed. Cursor controls move the cursor up, down, left, right, and home. The cursor appears as a blinking or solid block or underline, as selected by the user via a switch. The cursor is addressable.

Video attributes include normal video plus a choice of one visual effect per screen: either blinking, underline, reverse video, half intensity, or zero intensity.

A print transparent mode is available. In this mode, the terminal will pass all received data to the auxiliary interface and will not react to the commands of the data stream. ▶

ADDS Viewpoint Display Terminal

▷ Danish/Norwegian, Swedish/Finnish, German, French, and Spanish, are switch-selectable. A snap-on glare filter is optional.

Characters are displayed on the unit's screen in white on a dark background. The alphanumeric character set consists of 96 displayable ASCII codes, and characters are formed using a 5x8 dot matrix. Visual attributes include reverse video, blinking, underlining, and zero and half intensity. The cursor is addressable, and appears as either a block or underline, blinking or non-blinking.

The Viewpoint is intended to complement ADDS' Regent line of display terminals. The Viewpoint is also expected to be used in conjunction with ADDS' recently-introduced Mentor and Multivision computer systems products.□

► **COMPONENTS**

CRT DISPLAY UNIT: A 12-inch (diagonally measured) display screen with a display format of 24 lines of 80 characters each, for a total display capacity of 1920 characters. Characters are displayed in white on a dark background, and formed utilizing a 5 x 8 dot matrix. The alphanumeric character set consists of 96 displayable ASCII codes. The screen can be tilted in two positions.

Six international character fonts are switch-selectable, including U.K./Netherlands, Danish/Norwegian, Swedish/Finnish, German, French, and Spanish.

KEYBOARD: A 72-key, typewriter-style keyboard consisting of the main key array, plus a separate 14-key array with numeric, cursor control, and (3) function keys. The keyboard is detachable, and connected to the monitor via a coiled cord. Typematic is standard, and keyboard lock/unlock is under computer control. The keyboard design is stepped and sculptured.

When ordered with optional foreign compatible power supplies, the appropriate foreign key caps are included.

PRICING

The end user quantity one price for the Viewpoint is $650. The optional glare filter raises the price approximately $15. OEM and volume discounts are also available.■

ADDS Viewpoint Display Terminal

PRODUCT DESCRIPTION

Implementation of new technology has enabled ADDS to introduce the Viewpoint, a low-end ASCII display terminal which, at an end-user single quantity price of $650, is priced approximately 30% below any currently available display terminal. That new technology includes the use of a proprietary LSI (large scale integration) chip which has simplified the unit's physical and electronic design.

The chip, manufactured to ADDS specifications by Standard Microsystems Corporation of Hauppauge, New York, is a video controller which works in conjunction with a Zilog Z8 microprocessor to translate incoming data from the host into signals that drive the CRT monitor and display characters on the screen. The chip enables the company to place the Viewpoint's entire logic electronics on a single circuit board containing 11 chips. The reduced parts count, coupled with lower assembly costs, enable ADDS to offer the Viewpoint at its low price.

The Viewpoint features a 12" display screen with two tilt positions. The screen can display up to 1920 characters in a 24-line by 80-column format. The unit's keyboard has a typewriter-style layout including a 14-key numeric/cursor control cluster. The keyboard is detachable and connected to the display via a stretch cord. Six international character sets, including U.K./Netherlands, Danish/Norwegian, Swedish/Finnish, German, French, and Spanish, are switch-selectable. A snap-on glare filter is ▷ optional.

PRODUCT ANNOUNCEMENT: A new, low-priced ASCII display terminal from Applied Digital Data Systems (ADDS). The Viewpoint features a full-sized (12"), tiltable display screen and a detachable keyboard. End users' quantity one price is $650.

ANNOUNCEMENT DATE: March 2, 1981 (Boston).

DELIVERY SCHEDULE: Deliveries in volume quantities were scheduled to begin in March.

BASIC SPECIFICATIONS

VENDOR: Applied Digital Data Systems (ADDS) Inc., 100 Marcus Boulevard, Hauppauge, NY 11787. Telephone (516) 231-5400.

MODELS: The Viewpoint is available in two models: Model A contains all of the standard features; Model B contains all of the standard features while also offering a snap-on glare filter for the display screen.

TRANSMISSION SPECIFICATIONS

The Viewpoint provides for conversational (character by character) transmission in half- or full-duplex at speeds from 110 to 19,200 bits per second. An RS-232-C interface is standard. Odd, even, mark, or space parity is selectable.

PRICING

The end user quantity one price for the Viewpoint is $650. OEM and volume discounts are also available.■ ▶

ADDS' newest display terminal is the Viewpoint. At $650 (end user quantity one), the unit is priced at 30% below any currently available display with comparable features. Ergonomic design features standard on the Viewpoint include a two-position tilt screen and movable keyboard.
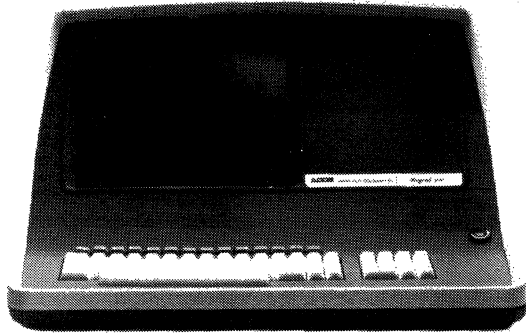
ADDS Viewpoint Display Terminal

▷ Characters are displayed on the unit's screen in white on a dark background. The alphanumeric character set consists of 96 displayable ASCII codes, and characters are formed using a 5 x 7 dot matrix. Visual attributes include reverse video, blinking, underlining, and zero and half intensity. The cursor is addressable, and appears as either a block or underline, blinking or non-blinking.

RELATIONSHIP TO CURRENT PRODUCT LINE: The Viewpoint is intended to complement ADDS' Regent line of display terminals. Viewpoint is available in one standard configuration; by contrast, Regent terminals are often customized to fit a user's specific needs. The Viewpoint is also expected to be used in conjunction with ADDS' recently-introduced Mentor and Multivision computer systems products.□

ADDS Regent 100 and 200 Display Terminals

A new family of stand-alone, micropro-cessor-based CRT keyboard/display termi-nals that feature Teletype compatibility and support data entry applications.

Standard features include a 1920-character display, 128 displayable symbols plus 11 graphic symbols, highlighting, a repeating keyboard with numeric pad, cursor address-ing and sensing, format protection, se-lectable transmission rates, etc. Options in-clude editing.

Single unit prices are $1,325 for the basic Regent 100 and $1,795 for the basic Regent 200. Quantity discounts are provided for both OEM and end-user quantity purchases.

MANAGEMENT SUMMARY

ADDS has joined the ranks of the microprocessor-based terminal industry with the introduction of its own micro-processor-based terminals, the Regent 100 and the Regent 200, the first members of a new terminal family. Both terminals are Teletype-compatible, stand-alone dis-play terminals with integral keyboards.

The Regent 100 is a basic unit designed as a Teletype replacement with several noteworthy features. The Regent 200 is an enhanced model with buffering, format protection, and an editing option; it is designed for data entry applications.

The terminals have the same physical appearance, feature the same screen size (12-inch) and display capacity, and a repeating keyboard with a separate numeric pad. Self-diagnostic firmware, a key feature, performs automatic diagnostic checking each time the terminal is powered up and displays the test results within the 25th line on the screen, which is designated as the status line. Display highlighting is still another important feature of both terminals. Selected fields can be displayed in half- or full-intensity, reverse video (black symbols on white), blinked, or underlined; selected fields can also be blanked (not displayed) for security purposes.

Salient features of the Regent 100 and 200 are:

● A 1920-character display capacity.

● 128 displayable ASCII symbols including upper and lower case alphabetics and representative symbols for the ASCII control codes.

● Eleven graphic symbols (in addition to the 128 dis-playable ASCII symbols).

● Cursor addressing and sensing.   ▷

CHARACTERISTICS

VENDOR: Applied Digital Data Systems (ADDS), Inc., 100 Marcus Boulevard, Hauppauge, New York 11787. Telephone (516) 231-5400.

DATE OF ANNOUNCEMENT: June 1977.

DATE OF FIRST DELIVERY: August 1977.

NUMBER DELIVERED TO DATE: —

SERVICED BY: ADDS and General Electric.

MODELS

Two microprocessor-based (Intel 8085) models are available; Regent 100 and Regent 200. Both models are stand-alone, Teletype-compatible terminals with attached keyboards. The Regent 200 provides additional features over the Regent 100, including an auxiliary I/O RS-232C interface, an option on the Regent 100.

TRANSMISSION SPECIFICATIONS

Transmission is asynchronous in the half- or full-duplex mode at 12 switch-selectable data rates from 75 to 19,200 bits/second with an RS-232C interface, or up to 9600 bits/second with a current loop interface. The 8-level, 10- or 11-unit ASCII code is used. Odd or even parity, marking, or spacing is switch-selectable. An RS-232C/CCITT V.24 or 20/60 ma dc current loop interface is available.

DEVICE CONTROL

REGENT 100: Transmission is performed on a character-by-character basis as each character is keyed. Received and keyed commands execute carriage return, line feed, screen erase, cursor positioning, and keyboard lock/unlock func-tions. An addressable cursor is standard. An operator-selectable roll function is provided. Data is rolled off the screen as it is keyed or entered after the last line is filled. Automatic line feed on carriage return is also an operator-selectable feature. An option package provides five discrete cursor control keys and eight program-defined function ▶

ADDS Regent 100 and 200 Display Terminals

▷ ● Forms generation and protection (Regent 200).

● Character and line insert and delete (Regent 200 option).

● Eight program function keys (optional on Regent 100; standard on Regent 200).

● Individual cursor control keys (optional on Regent 100; standard on Regent 200).

● Display highlighting.

● Diagnostic self-testing.

● An auxiliary I/O interface (optional on Regent 100; standard on Regent 200).

● Selectable asynchronous transmission speeds from 75 to 19,200 bps.

General Electric TermiNet series printers are available from ADDS for use as a hard-copy device.

The Regent terminals are available on a purchase-only basis from ADDS, but a lease and rental plan will be introduced shortly by General Electric.□

➤ keys. The optional cursor control keys move the cursor up, down, left, right, and home. Terminal status information, such as terminal mode (on-/off-line), auxiliary port enabled/ disabled, and communications line status, is displayed on the 25th line of the screen. A self-diagnostic firmware routine performs a diagnostic check each time the terminal powers up; the results are displayed in the status line. The host processor can interrogate the Regent 100 for the current cursor address and memory contents (or value) at the cursor location.

REGENT 200: Three operating modes are provided: Conversational, Message, and Page. Conversational mode transmits a character for each key depression. Page mode transmits a full or partial page of data. Message mode transmits a partial or full line of data. Received and keyed commands execute carriage return, line feed, erase functions, keyboard lock/unlock, etc. An operator-selectable roll function is provided. Data is rolled off the screen as it is keyed or received, after the last line is filled. Automatic line feed on carriage return is also an operator-selectable feature.

Cursor controls are provided that move the cursor up, down, left, right, and home. Cursor addressing and sensing are standard features. Format protection is also a standard feature. Format protection restricts data entry to unprotected fields. Either unprotected fields or the entire form can be transmitted or transferred to an auxiliary device. Print-only and constant fields can be embedded in the screen format to control a printer or transmit special codes in the data stream. Protected or unprotected fields can be highlighted by reverse video, half- and full-intensity, blinking, and underlining. Fields can also be designated for non-display of data. Standard editing features include line and page erasure, character overwrite, backspace, and forward and backward tab. Character and line insert and delete functions are optional. Eight program function keys are standard for execution of program-defined functions. Terminal status information, such as terminal mode (on/off-

▶ line), auxiliary port enabled/disabled, and communications line status, is displayed on the screen's 25th line. A self-diagnostic firmware routine performs a diagnostic check each time the terminal powers up; the results are displayed in the status line. The host processor can interrogate the Regent 200 for the current cursor address and memory contents (or value) at the cursor location.

COMPONENTS

CRT DISPLAY UNIT: A 12-inch (diagonal measurement) CRT with a display arrangement of 24 lines of 80 characters, each for a total display capacity of 1920 characters. The character set consists of 128 displayable ASCII symbols including upper and lower case alphabetics, numerics, specials, and representative symbols for control codes. The line drawing character set consists of 11 special graphic symbols. Each character is formed via an 8-by-8 dot matrix. Data is displayed in white (P4 phosphor). Highlighting features include dual intensity, blanking, reverse video, blinking, and underline.

KEYBOARD: A typewriter-style, attached keyboard that can generate any of 128 ASCII character codes. All keys feature repeat action. A 14-key numeric pad is standard for both models. Eight program function keys, five cursor control keys, and an auxiliary interface key are standard on the Regent 200 and optional on the Regent 100. A separate edit keypad on the Regent 200 includes line and page erase, backspace, and optional character and line insert and delete keys.

PRICING

The ADDS Regent 100 and 200 are available for purchase only. Quantity discounts are provided for end-user and OEM purchases. ADDS also provides an educational discount. Maintenance service and installation are provided by ADDS and by General Electric's Apparatus Service Business Division. Maintenance and installation prices have not yet been established, but will probably be about $22 per month per terminal for service and $75 per terminal per installation.

ADDS warrants each terminal for a period of 90 days from the date of shipment. The warranty covers defects in material and workmanship under normal use and service. The warranty period is extended to two years under the ADDS Extended Warranty Option which is available at a cost of $100 per terminal.

Under the educational discount, the Regent 100 sells for $1,150, and the Regent 200 sells for $1,650.

Purchase Price

End-User	1-4 Units	5-9 Units	10-24 Units	25-49 Units	50-99 Units
Regent 100	$1,325	$1,285	$1,190	$1,150	$1,095
Regent 200	1,795	1,760	1,725	1,650	1,525
Regent 100 Option Package	125	125	125	125	125
Regent 200 Option Package	145	145	145	145	145

OEM	1-24 Units	25-99 Units	50-99 Units
Regent 100	$1,125	$1,025	$ 995
Regent 200	1,495	1,380	1,275
Regent 100 Option Package	60	60	60
Regent 200 Option Package	75	75	75■