Digital Equipment Corporation VT300 Display Family

In this report:

Product Summary

Editor's Note
Digital now offers the VT320, VT330, and VT340 displays, successors to the VT200 family that provide complete backward-compatibility with improved ergonomics and functionality. Digital continues to provide service for the older line of displays, however.

Description
The VT320 is a monochrome display that provides single-session support for text-oriented applications. The VT330 and VT340 both provide dual sessions and graphics capability.

Strengths
In addition to introducing dual-session support with the VT300 family, Digital designed higher resolution, faster processing speed, and greater customization capability into the displays while lowering prices significantly.

Limitations
Vendors such as Wyse Technology, TeleVideo, Microterm, and Hewlett-Packard offer VT clones that provide enhancements such as multiple display configurations, more function keys and interfacing options, and more internal memory.

Competition
VT320-compatible displays are offered by TeleVideo, Wyse Technology, Qume Corporation, Microterm, and Hewlett-Packard. Microterm also offers VT330- and VT340-compatible displays. AT&T, Falco Data Products, and a few other vendors offer VT320 emulation in their general-purpose ASCII displays.

Vendor
Digital Equipment Corp. (DEC)
146 Main Street
Maynard, MA 01754-2571
(508) 493-5111

Price
The North American Version of the VT320 sells for $575; the international version of the display costs $625. The VT330 and VT340 sell for $1,995 and $2,795, respectively.

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Analysis

Product Strategy

Digital Equipment Corporation's VT300 family, which consists of the VT320, VT330, and VT340 display terminals, is the third and most advanced generation of display terminals designed by Digital for communications with applications running on VAX host computers.

These displays feature full backward compatibility with their predecessors, the VT220, VT240, and VT241 models, while providing ergonomic improvements and better functionality. With the VT330 and VT340, Digital introduced dual session capability. The VT300 products operate up to five times faster than the older models, provide higher resolution, and display fonts that are more pleasing to the eye. Enhanced setup menus provided with these displays allow greater keyboard customization.

The VT320 is an entry-level, single-session display that replaces the VT220. Designed for text-oriented applications, the VT320 includes a 14-inch monochrome screen that displays green, amber, or paper-white characters in 80- and 132-column formats. This terminal provides the smallest footprint of any display yet offered by Digital.

Unlike the VT240 and VT241 displays, the VT330 and VT340 support dual-session capability over one or two wires. The VT330, a monochrome model, comes with a 14-inch screen that displays either green, amber, or paper-white characters in 80- or 132-column text arrangements. For graphics applications, up to four levels of shading are supported. The VT340 includes a 13-inch screen that supports 16-color graphics and 80- or 132-column text arrangements.

Competitive Position

Digital occupies a distinct but somewhat separate subsection of the asynchronous display market referred to as the ANSI segment. With the release of the VT100 display in 1978, Digital became the first vendor to support the American National Standards Institute's (ANSI's) X3.64 standard, which was first published in 1977 to standardize control codes for all terminals. To offer VT emulation, other vendors have also adopted this standard for their display terminals.

Various research organizations have estimated that Digital holds from 60 to 80 percent of the ANSI terminal market. Over 1 million VT100 and one million VT200 family displays were sold prior to their discontinuance, and Digital has recently announced the shipment of the one millionth VT320 display.

The Digital Equipment Corporation VT300 family consists of the VT320, VT330, and VT340 displays. The VT320 is a single-session text terminal; the VT330 is a monochrome text/graphics terminal with dual-session capability and support for six levels of shading; the VT340 is a 16-color text/graphics terminal also with dual-session capability.

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Company Profile Digital Equipment Corporation

Corporate Headquarters
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European Headquarters is in Geneva, Switzerland. General International Headquarters is in Acton, MA.

Officers
Pres.: Kenneth H. Olsen
Sr. VP, Mrktg., Sales, Service, Channels, International: John J. Shields
Sr. VP, Eng. & Mfg.: John F. Smith
Pres. & CEO, European Operations: Pier Carlo Falotti

Company Background
Year Founded: 1957
No. Employees: 125,000

Digital is a leading supplier of computer systems and associated peripherals, networks, communications, software, and services. The products are used in a variety of applications in business, industry, government, and scientific areas. Both direct and indirect channels are used to market and support products worldwide.

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The current VAX family consists of VAXstation desktop workstations; MicroVAX departmental systems; VAX 6000 Series medium-range systems; and VAX 9000 Series high-end mainframes.

In addition to the VAX family, Digital offers DECsystems that use reduced instruction set computing (RISC) technology and operate under ULTRIX, Digital's implementation of the UNIX operating system.

To support its systems, Digital offers disk, storage array, and solidstate memory products, optical disks, tape devices, displays, and printers. Besides hardware and software, Digital offers a range of communications and networking products and services.

Financial Profile
For the 1989 fiscal year, Digital reported revenues of $12.7 billion, up 11 percent from $11.5 billion the previous year. Net income was $1.1 billion, down 8 percent from $1.3 billion in 1988. According to the president's letter to Digital's shareholders in 1989, "Digital's revenue growth came from overseas markets, particularly Europe and Japan."

Management Statement
Digital has a $1.5 billion dollar investment in new product development. According to the president's letter, Digital is "continuing to invest heavily in VAX and RISC-based systems and VMS and UNIX software." Within the next year, "Digital's strategy is to focus on the computing environment of the 1990s. Digital will offer the widest selection of technology and continue to make significant investments in R&D and new products in response to dynamically changing customer needs."

The rest of the ANSI market is controlled by general-purpose ASCII display vendors that offer VT clones and VT emulation. The VT100 is the most widely emulated asynchronous terminal, with over one million imitations sold. Digital also suffered competition from numerous low-priced VT200 imitators, which caused the vendor to adjust prices accordingly.

At present, there is a small handful of VT300-compatible displays on the market. Wyse Technology's WY-185, Qume Corporation's QVT323-EV, Microterm's model 5520, and Hewlett-Packard's HP 700/32 displays boast VT320-compatibility with enhancements such as more programmable function keys, greater interfacing flexibility, higher resolution, faster transmission speeds, multiple display configurations, and more screens of internal storage. The TeleVideo and Wyse models sell for only $499. MMicroterm's 5530 display, a VT330-compatible product priced at $1,495, provides 16 shades of gray. Microterm also offers a VT340-compatible terminal, the 5540, which sells for only $2,350 and provides color mapping for each individual session and 16 colors from a

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262,144-color palette. Both the 5530 and 5540 support transmission speeds as high as 38.4K bps. A few vendors, including AT&T, Falco Data Products, and Visentech Systems, have incorporated VT320 emulation into their general-purpose ASCII displays. Vendors continue to play the better price/performance game. It appears, however, that fewer of them are able or willing to match Digital's moves this time around.

Decision Points

The VT330 family provides two major improvements over its predecessors—dual session capability (for the VT330 and VT340) and up to five times faster processing speed. These models offer higher resolution, more versatility, easier-to-read display fonts, and a new paper-white phosphor character color for the monochrome VT320 and VT330 models. The VT340 supports up to 16 colors, while the older VT241 supports only four. These enhancements, with much more competitive prices, have helped Digital to maintain its strong position in the display market.

Digital's VT300 products are completely backward-compatible with previous Digital displays, as well as the software supporting them—a factor that gives Digital a decided advantage over general-purpose ASCII terminals that offer only VT emulation. Digital's reputation for manufacturing reliability and full service and support for its VAX systems also contribute to the vendor's advantage over competitors offering VT clones with improved price/performance.

Characteristics

Models: VT320, VT330, and VT340

Date Announced: VT320—August 1987; VT330 and VT340—April 1987.

Date First Installed: VT320—September 1987; VT330 and VT340—May 1987.

Number of Installed Units: Over 1 million VT300 terminals have been installed.

Serviced by: Digital Equipment Corporation.

System Components

The Digital VT300 display terminal family consists of three models: the VT320, VT330, and the VT340. All three conform to the ANSI X3.64 standard.

Transmission Specifications

Transmission is asynchronous in full-duplex mode, with user-selectable local echo, seven- or eight-bit ASCII code, one or two stop bits, and any of the following types of parity: even, odd, none, even no-check, odd no-check, mark, and space (seven-bit only). Users select host communications parameters through setup screens. Characters are transmitted one by one, as each key is depressed. Selectable transmission speeds of 75, 110, 150, 300, 600, 1200, 2400, 4800, 9600, and 19,200 bps are supported over DEC423 or RS-232-C cable.

Device Control

The VT300 is fully backward compatible with the VT220 display; similarly, the VT330 and VT340 are fully compatible with the VT240 and VT241 displays, respectively. Users can install and use VT300 family terminals without software modifications to existing application programs that support VT200 family products.

The default character sets for these displays are the Digital Multinational ISO Latin-1 character sets. With VT330 and VT340 displays, and the international version of the VT320, users can optionally select English, German, or French versions of the setup menu system, and any of 12 national replacement character sets.

Visual attributes of these displays include reverse video and text highlighting using a blinking block or a blinking underline. Both the VT330 and VT340 support two high-level graphics instruction sets: Digital's Remote Graphics Instruction Set (ReGIS) and Tektronix' 4010/4014 graphics protocols.

Programmable function keys enable the user to define and store commonly used sets of commands (up to 256 characters in length), which can be executed with a single keystroke.

The VT320 includes a 14-inch, flat, antiglare monochrome screen with either green, amber, or paper-white characters, a Digital LK201 keyboard that comes in 16 different international versions, and an integrated tilt mechanism. Swivel capability is offered optionally

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through an alternate type of base. Each keyboard style provides 15 programmable function keys and a numeric keypad.

Designed for text-oriented applications, the VT320 provides single-session capability with a screen arrangement of 24 lines by either 80 or 132 columns, and a maximum screen resolution of 1,200 pixels by 300 scan lines. The screen includes a 25th status line, which can be programmed to display either system messages or terminal-specific information, such as cursor position or printing status. The VT320 provides a series of setup screens, allowing the user to customize keyboard, host communications, printing, and display characteristics.

The VT320 comes in two versions: a North American version and an international version. Both types include two DEC423 MMJ serial communications ports—one for a host connection and one for a display-attached Digital printer. Adapters for connecting non-Digital printers are also available optionally. The North American version accommodates 120 volt power, and includes a DEC423 cable and a 25-pin adapter that is compatible with most standard U.S. modems. The international version accommodates 240 volt systems, and provides full modem support through an RS-232-C, 25-pin adapter. The international version also includes setup screens in English, French, and German.

The VT330 and VT340 are dual-session displays designed for graphics and text applications. They both provide storage of six screens of text or two screens of graphics for fast switching between sessions. The VT330 includes a 14-inch, flat, monochrome screen with either green, amber, or paper-white characters. For graphics applications, the VT330 supports four levels of shading, providing a maximum screen resolution of 800 pixels by 500 lines. The VT340 includes a 13-inch convex screen that displays up to 16 colors selectable from a palette of 4,096 colors, and a maximum screen resolution of 800 pixels by 500 lines. Both models come with a Digital LK201 keyboard available in 16 international versions. Each keyboard style provides 15 programmable function keys and a numeric keypad.

The VT330 and VT340 provide screen arrangements of 24 lines by 80 or 132 columns, and a 25th status line for system messages or terminal-specific information, such as cursor position or printing status. Users can view two sessions simultaneously in split-screen mode, or switch between full-screen sessions with a hot key. A comprehensive set of menu screens (in English, French, and German) allows users to customize keyboard, display, host communications, and printing characteristics.

The VT330 and VT340 provide one RS-232-C host communications port and one DEC423 host communications port. Dual sessions, running on a single host, can be conducted over a single cable, if desired, using Digital's Session Support Utility (SSU). Each VT330 and VT340 display also includes one DEC423 port for a display-attached printer. Adapters for non-Digital printers are available optionally.

Pricing

The North American version of the VT320 sells for $575, while the international version of the same display sells for $625. The VT330 and VT340 displays are priced at $1,995 and $2,795, respectively. Digital offers a wide selection of warranty and service agreements for these products. Users can choose on-site coverage up to 24 hours a day, seven days a week. Carry-in and mail-in repair arrangements are also available. ■

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European Headquarters is in Geneva, Switzerland. General International Headquarters is in Acton, MA.

Officers
Pres.: Kenneth H. Olsen
Sr. VP, Mrktg., Sales, Service, Channels, International: John J. Shields
Sr. VP, Eng. & Mfg.: John F. Smith
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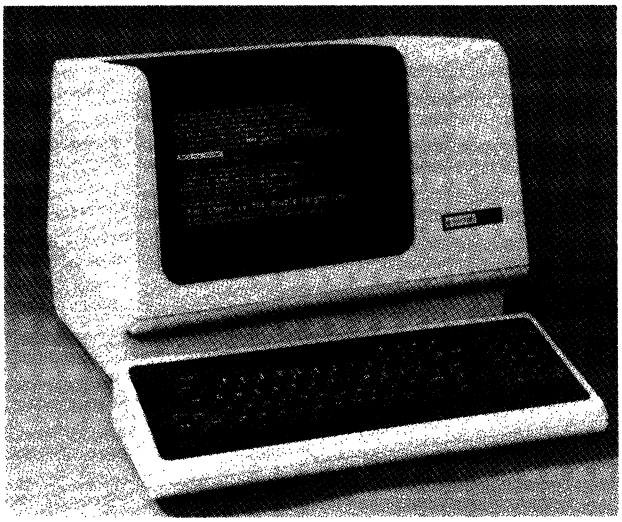

Since its introduction in 1978, Digital Equipment Corporation has sold 1,000,000 VT100 terminals.

The VT100 Video Display Terminal is an acknowledged standard in the terminal industry. It is the most popular ASCII terminal ever produced, with 1,000,000 units sold since its introduction in 1978. A large emulation market has sprung from the VT100. Digital Equipment Corporation has introduced the VT200 display terminal family, a new generation that will replace the VT100 product line.

MODELS: VT100, VT102, VT125, and VT131.
DISPLAY: All models feature a 12-inch (diagonal) display; characters are displayed in white. All models feature 80-/132-column display capability.
KEYBOARD: All models feature a detachable keyboard with a typewriter-style layout.
COMPETITION: Several vendors continue to offer terminals with VT100 emulation; however, the market is now geared toward VT200 terminal emulation.
PRICE: Purchase prices range from $895 to $3,800.

MANAGEMENT SUMMARY

UPDATE: *Upon the introduction of the VT200 display terminal family in 1983, Digital Equipment Corporation stated that it would continue to offer the older VT100 line for at least two years. Digital has recently slashed prices for its VT100 video display terminal family, indicating that the product line will soon be discontinued. As of now, the VT100 terminals are no longer being manufactured; we have updated this report due to the significance of the product line.*

The end is finally near for the VT100 display terminal. Following the introduction of the VT200 terminal family in 1983, Digital has made good on its promise to keep the VT100 available for at least two additional years. In October 1985, however, the company announced significant price cuts for the VT100; this move is likely to clear out Digital's remaining inventory of VT100 terminals.

Digital's VT100 Video Display Terminal stands as the most successful and most widely emulated ASCII display terminal ever. The VT100, which is used chiefly with Digital's VAX line of computers, created an emulation market that is second only to the IBM 3270 market in size. According to Digital, VT100 sales reached the 1 million-unit mark in the fall of 1985, some seven years after its introduction in 1978. The VT100 succeeded the company's earlier VT52 terminal; in November 1983, Digital introduced the VT200 Series of displays, which succeeds the VT100.

In its basic configuration, the VT100 can display 24 lines of 80 characters, or 14 lines of 132 characters. Transmission is performed in character mode. Like all members of the family, the VT100 features a 12-inch (diagonal) display screen and detachable, typewriter-style keyboard. Other standard features include scrolling (jump or smooth), re-

CHARACTERISTICS

VENDOR: Digital Equipment Corporation, 146 Main Street, Maynard, MA 01754-2571. Telephone (617) 897-5111.

DATE OF ANNOUNCEMENT: VT100—June 1978; VT125—July 1981; VT101 and VT131—September 1981.

DATE OF FIRST DELIVERY: VT100—September 1978; VT125—September 1981; VT101, VT102, and VT131—October 1981.

NUMBER DELIVERED TO DATE: 1,000,000 (worldwide).

SERVICED BY: Digital Equipment Corporation.

MODELS

The VT100 terminals are stand-alone, desktop units featuring a 12-inch (diagonal) display screen and a detachable, typewriter-style keyboard. The following models currently comprise the family:

- **VT100—The basic model. The unit is upgradable, and can be configured with the Advanced Video Option and the Printer Port Option.**
- **VT101—A nonupgradable, entry-level model; it contains all of the base features of the VT100, but will accept no options. The VT101 is no longer available.**
- **VT102—Also nonupgradable, but contains all VT100 base features plus the AVO and Printer Port Option as standard features.**

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Digital Equipment Corporation VT100 Video Display Terminal Family

verse video, variable screen brightness, audible key click, and auto repeat keys. The VT100 will support expanded capabilities and options. By adding the Advanced Video Option (AVO), the VT100 gains the following features: four alternate character attributes—bold, underline, blink, and reverse—which can be selected on a character-by-character basis; expanded display memory allowing for a display format of 24 lines by 132 characters; and provision for alternate character sets.

In 1981, Digital Equipment Corporation expanded the VT100 family by adding several submodels of the VT100. These included the VT101 (no longer available), an entry-level model without the expansion capabilities of the VT100; the VT102, like the VT101, a nonexpandable model, but including the Advanced Video Option and Printer Port Option; the VT131, a block mode version of the VT102; and the VT125, a terminal with business graphics as well as alphanumeric capability. With the introduction of the VT200 Series, Digital Equipment Corporation placed these submodels in "maintenance mode"; this meant that they would no longer be manufactured, but Digital would continue to supply them on an "as available" basis and to support them. Production of the VT100 has also ceased, but Digital has promised to continue to support its installed base of VT100 terminals for service and repair.

COMPETITIVE POSITION

As was mentioned earlier in this report, the VT100 Video Display Terminal achieved such widespread acceptance that it created a sizable emulation market. Virtually every major general-purpose ASCII display terminal vendor included a VT100 emulator in its product line. Now, the same can be said of the new VT200 terminals, particularly the VT220, a direct replacement for the VT100. However, Digital is now positioned to take an even larger share of this market.

When the VT100 was introduced, Digital did not anticipate the huge demand for the terminal; because of this, it was unable to sufficiently meet the demand it had created for the terminal. Lead time for delivery of a VT100 terminal was often three-to-five months. In addition, the VT100 carried a high price tag. The independent terminal vendors made the most of this opportunity, offering lower priced emulators and shorter delivery times.

Digital has apparently learned from its VT100 experience. The new VT200 terminals are priced competitively, and are readily available. Nevertheless, the independent vendors have jumped on the VT200 bandwagon quickly, and VT200 clones are plentiful. The result, of course, is that the user can now purchase a VT220 emulator for as little as $795; and prices may fall even lower.

ADVANTAGES AND RESTRICTIONS

The VT100 achieved its high degree of success despite the fact that, traditionally, it carried a high price tag. The functions available on the VT100 (particularly the full-

- **VT125—Contains all of the features of the VT100, plus a business graphics capability. The VT100 can be upgraded to the VT125 via the VT125 upgrade kit.**
- **VT131—The block mode/local edit version of the VT102.**

TRANSMISSION SPECIFICATIONS

Transmission is asynchronous, in full-duplex mode (the VT102 and VT131 also support half-duplex mode); at speeds of 50, 75, 110, 134.5, 150, 200, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 9600, and 19,200 bits per second. The 7- or 8-bit ASCII code is used. Odd, even, mark, or no parity is selectable from the keyboard. Local echo is standard on the VT101, VT102, and VT131, and available on VT100s equipped with the printer port. An RS-232-C interface is standard; a 20 ma current loop interface is optional.

DEVICE CONTROL

On the VT100, VT101, VT102, and VT125, transmission is performed on a character-by-character basis as each key is depressed by the operator. On the VT131, data is stored in the terminal buffer as it is keyed. It is then transmitted in block form. The VT100 terminal memory is nonvolatile—feature settings are retained when the terminal is powered down.

The selection and storage of local terminal features is performed in Set-Up mode. When entering Set-Up mode, the status of the features stored in the temporary memory is shown on the screen. Features can be changed, and new features stored on a temporary basis by leaving Set-Up mode. The new features can be stored on a fixed basis by performing a save operation. If a recall operation is performed, the terminal is reset, or terminal power is turned off, all temporary settings are replaced by the features that have been stored on a fixed basis.

The VT100 family terminals are compatible with either of two different programming standards: ANSI, or Digital Equipment Corporation VT52. In ANSI mode, the VT100 terminals will respond to software based on ANSI standards. In VT52 mode, the terminals will respond to software written for use with Digital Equipment Corporation's older VT52 video display terminal.

In addition to selection of ANSI or VT52 mode, the following features can be selected when in Set-Up mode (note that not all features are available on all models); answerback message, full-duplex communications, host editing, local edit/block mode transmission, local echo, auto X-on/X-off, display format (80- or 132-column), on-line/local operation, new line, parity, parity sense, receive/transmit speeds, scroll, tabs, wraparound, character set (U.S., U.K., and special line drawing sets are standard on all models), cursor, key click, margin bell, screen background (normal or reverse), screen brightness, and auto repeat.

Cursor controls move the cursor up, down, left, right, home, and return. The cursor may be selected as either a blinking block or blinking underline.

Advanced Video Option provides dual intensity, blink, and underline functions in any combination with each other and with reverse video. This option also adds 10 additional 132-character display lines for a total of 24 lines. The Advanced Video Option also provides additional circuitry to add an alternate or custom character set in the future. Thus, two character sets would reside in the terminal.

The VT100 provides composite video input and output. Composite video input permits the user to overlay video output from a remote terminal or processor without interfer-

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Digital Equipment Corporation VT100 Video Display Terminal Family

Feature	VT100	VT101	VT102	VT131	VT125
Base VT100 Features	Std.	Std.	Std.	Std.	Std.
Upgradable	Yes	No	No	No	Yes
Advanced Video Option (AVO)	Opt.	No	Std.	Std.	Opt.
Printer Port	Opt.	No	Std.	Std.	Std.
Local Echo	Opt.*	Std.	Std.	Std.	No
Full-duplex Communications	Yes	Yes	Yes	Yes	Yes
Half-duplex Communications	No	No	Yes	Yes	No
Modem Control Support	No	No	Yes	Yes	No
Host Editing	Opt.*	No	Yes	Yes	No
Block Mode Transmission/Local Editing	No	No	No	Yes	No
Bit Map Graphics	Opt.	No	No	No	Std.

With Printer Port.

screen 132-column display capability) were not always available from less expensive imitators, and obviously offset the higher price. Also, given the popularity of Digital's VAX series computers, the VT100 terminals served a huge market. Digital Equipment Corporation, with the introduction of the VT200 terminals, has moved to close the price/performance gap that competitors had traditionally used to obtain a share of this market.

USER REACTION

In Datapro's 1985 Terminal Users Survey, conducted in conjunction with *Data Communications* magazine, a total of 111 users responded with ratings for the VT100 family terminals. These users represented a total installed base of 7,975 units. Seventy-one of these users reported on their experiences with the VT100, totalling 6,096 installed terminals; the remaining 40 users reported on the various submodels of the VT100 family, covering 1,879 VT101, VT102, VT125, and VT131 terminals. The users were asked to rate their terminals with regard to seven separate categories. The ratings given to the VT100 family terminals by these users are summarized in the following tables:

VT100

	Excellent	Good	Fair	Poor	WA*
Overall performance	33	34	4	0	3.4
Ease of operation	33	31	5	0	3.4
Display clarity	23	38	6	2	3.2
Keyboard feel & usability	29	28	12	0	3.3
Ergonomics	8	18	31	10	2.4
Hardware reliability	31	30	5	3	3.3
Maintenance service/ technical support	28	26	9	4	3.2

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

Other VT100 family (VT101, VT102, VT125, VT131)

	Excellent	Good	Fair	Poor	WA*
Overall performance	15	24	1	0	3.4
Ease of operation	17	20	3	0	3.4
Display clarity	14	18	8	0	3.2
Keyboard feel & usability	18	16	5	0	3.3
Ergonomics	3	10	20	5	2.3
Hardware reliability	14	21	5	0	3.2
Maintenance service/ technical support	13	14	10	1	3.0

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

ing with local usage. Composite video output permits the VT100 to drive an auxiliary monitor which is useful where data or text must be displayed to a group of people.

The VT125 directly executes Digital Equipment Corporation's general-purpose graphics descriptor, ReGIS (Remote Graphics Instruction Set), providing a bit map graphics capability, ReGIS allows the creation and storage of pictorial data as simple ASCII text. Graphics capabilities in the ReGIS firmware allow for the plotting of trend lines, bar charts, and pie charts. In engineering laboratory applications, point plot graphs and strip charts can be plotted. Digital Equipment Corporation makes available an upgrade kit to convert a VT100 to the VT125.

COMPONENTS

CRT DISPLAY UNIT: A 12-inch (diagonally measured) display screen is standard on all models. Characters are displayed in white (P4 Phosphor) on a dark background, and are formed utilizing a 7-by-9 dot matrix with descenders. The 96-character upper-/lowercase ASCII set is displayable. U.S., U.K., and line drawing character sets are standard on all models. The VT125 provides business graphics display.

The standard display format on the VT100, VT125, and VT101 is either 24 lines of 80 characters, or 14 lines of 132 characters. By adding the AVO to the VT100 and VT125, the 132-column format is increased to 24 lines. The AVO is standard on the VT102 and VT131; it is not available on the VT101.

Standard video attributes include normal or reverse video (full screen), double-high/-wide characters (line-by-line basis), and adjustable screen brightness. Terminals equipped with the AVO have these additional video attributes; bold, underline, blink, and reverse. These attributes can be selected on a character-by-character basis. The AVO also provides for alternate character sets to be mapped in a ROM and inserted into the terminal. These alternate characters can also be selected on a character-by-character basis.

KEYBOARD: A sculptured typewriter-style, detachable keyboard which is attached to the monitor via a 6-foot coiled cord. The keyboard contains 83 keys, including a 65-key main array and an 18-key numeric/function pad. The numeric pad includes four program function keys. Visual indicators on the keyboard include seven LEDs; three are dedicated to ON-LINE, LOCAL, and KDB LOCKED, and four are user-programmable. Audible signals include key click and bell.

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Digital Equipment Corporation VT100 Video Display Terminal Family

The users were also asked whether or not they would recommend the VT100 family terminals to other users. Overall, 83 users said that they would recommend them; 11 stated that they would not. The remaining users were undecided, or chose not to answer the question. □

PRICING

The VT100 family terminals are available for purchase only, on an "as available" basis; they are no longer manufactured. Digital Equipment Corporation will continue to support the terminals through its Field Service, available worldwide.

EQUIPMENT PRICES

	Purchase Price ($)	Monthly Maint. ($)
VT100	895	18
VT102	995	22
VT131	995	22
VT125	3,800	29
Advanced Video Option (AVO)	95	— ■

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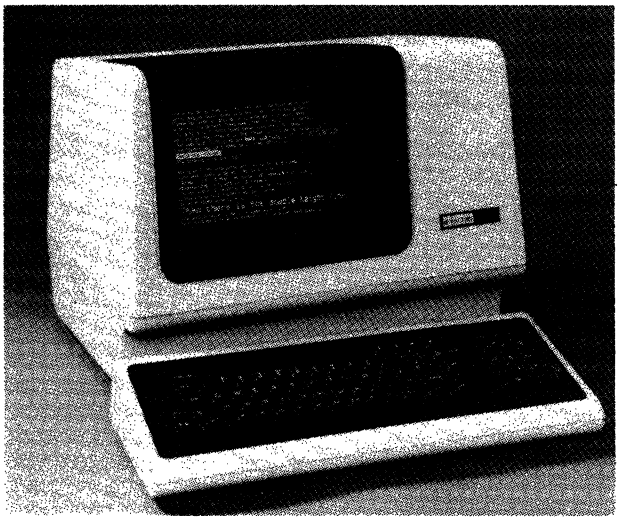
Digital Equipment Corporation VT100 Video Display Terminal Family



Since its introduction in 1978, Digital Equipment Corporation has shipped over 500,000 VT100 terminals.

The VT100 Video Display Terminal is an acknowledged standard in the terminal industry. It is the most popular ASCII terminal ever produced, with over 500,000 units installed since its introduction in 1978. A large emulation market has sprung from the VT100. Digital Equipment Corporation has introduced the VT200 display terminal family, a new generation that will eventually replace the VT100.

MODELS: VT100, VT101, VT102, VT125, and VT131.
DISPLAY: All models feature a 12-inch (diagonal) display; characters are displayed in white. All models feature (80-/132-column) display capability.
KEYBOARD: All models feature a detachable keyboard with a typewriter-style layout.
COMPETITION: A large number of vendors provide VT100 emulators, including CIE Terminals, Visual Technology, Teleray, and Lear Siegler.
PRICE: Purchase prices range from $1,945 to $3,800.

MANAGEMENT SUMMARY

UPDATE: *Digital Equipment Corporation's VT100 video display terminal family, despite the introduction of the VT200 series, remains an active product line.*

Digital Equipment Corporation's VT100 Video Display Terminal is the most successful, and most widely emulated, ASCII display terminal ever. The VT100 has created an emulation market that rivals the IBM 3270 market in size. According to Digital Equipment Corporation, over 500,000 VT100 terminals have been shipped since its introduction in 1978. The VT100 succeeded the company's earlier VT52 terminal; in November 1983, Digital Equipment Corporation introduced the VT200 Series of displays, which will eventually succeed the VT100. Digital Equipment Corporation announced, however, that it would continue to manufacture the VT100 for at least the next two years; as of this writing, the VT100 family of terminals is still available.

In its basic configuration, the VT100 can display 24 lines of 80 characters, or 14 lines of 132 characters. Transmission is performed in character mode. Like all members of the family, the VT100 features a 12-inch (diagonal) display screen and detachable, typewriter-style keyboard. Other standard features include scrolling (jump or smooth), reverse video, variable screen brightness, audible key click, and auto repeat keys. The VT100 will support expanded capabilities and options. By adding the Advanced Video Option (AVO), the VT100 gains the following features: four alternate character attributes—bold, underline, blink, and reverse—which can be selected on a character-by-character basis; expanded display memory allowing for a display format of 24 lines by 132 characters; and provision for alternate character sets.

CHARACTERISTICS

VENDOR: Digital Equipment Corporation (DEC), 146 Main Street, Maynard, MA 01754-2571. Telephone (617) 897-5111 or 1-800-DIGITAL Ext. 990.

DATE OF ANNOUNCEMENT: VT100—June 1978; VT125—July 1981; VT101 and VT131—September 1981.

DATE OF FIRST DELIVERY: VT100—September 1978; VT125—September 1981; VT101, VT102, and VT131—October 1981.

NUMBER DELIVERED TO DATE: Over 500,000.

SERVICED BY: Digital Equipment Corporation.

MODELS

The VT100 terminals are stand-alone, desktop units featuring a 12-inch (diagonal) display screen and a detachable, typewriter-style keyboard. The following models currently comprise the family:

- **VT100—The basic model. The unit is upgradable, and can be configured with the Advanced Video Option and the Printer Port Option.**
- **VT101—A nonupgradable, entry-level model; it contains all of the base features of the VT100, but will accept no options.**
- **VT102—Also nonupgradable, but contains all VT100 base features plus the AVO and Printer Port Option as standard features.**

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Digital Equipment Corporation VT100 Video Display Terminal Family

In 1981, Digital Equipment Corporation expanded the VT100 family by adding several submodels of the VT100. These included: the VT101, an entry-level model without the expansion capabilities of the VT100; the VT102, like the VT101, a nonexpandable model, but including the Advanced Video Option and Printer Port Option; the VT131, a block model version of the VT102; and the VT125, a terminal with business graphics as well as alphanumeric capability. With the introduction of the VT200 series, Digital Equipment Corporation has placed these submodels in "maintenance mode"; they will no longer be manufactured, but Digital Equipment Corporation will continue to supply them on an "as available" basis and to support them. It is likely, however, that these submodels will remain available for some time through Digital Equipment Corporation distributors; therefore, we will continue coverage in this report.

Digital Equipment Corporation also offers the option of converting the VT100 terminal into a personal computer through the addition of the VT18X Personal Computing Option. The VT18X kit consists of a Z80 microprocessor, 64K bytes of memory, dual 5¼-inch diskette drives, and installation hardware. The resulting VT180 Personal Computing Terminal features a CP/M operating system. The VT181X option is not available for models in the VT100 family other than the VT100 itself.

COMPETITIVE POSITION

As was mentioned earlier in this report, the VT100 Video Display Terminal has achieved such widespread acceptance that it has spawned a sizable emulation market. Virtually every major general-purpose ASCII display terminal vendor includes a VT100 emulator in its product line. Advanced Resources Development, a market research firm, estimated 1982 shipments of VT100-type terminals at 155,000. Of these, approximately 50 percent were Digital Equipment Corporation units, the remainder were emulators from various vendors, including CIE Terminals, Visual Technology, Datamedia, Teleray, Ann Arbor, Micro-Term, and Lear Siegler. Given the huge number of Digital Equipment Corporation computers in use, the demand for VT100 emulators should remain strong for some time to come. The new VT200 products should further strengthen this market, keeping it profitable for both Digital Equipment Corporation and its competitors.

ADVANTAGES AND RESTRICTIONS

The VT100 has achieved its high degree of success despite the fact that, traditionally, it has carried a price tag that has been somewhat high for the ASCII terminal market. The functions available on the VT100 (particularly the full-screen 132-column display capability) are not always available from less expensive imitators, and obviously offset the higher price. Digital Equipment Corporation, with the introduction of the VT200 terminals, has moved to close the price/performance gap that competitors have used to obtain a share of this market.

- **VT125—Contains all of the features of the VT100, plus a business graphics capability. The VT100 can be upgraded to the VT125 via the VT125 upgrade kit.**
- **VT131—The block mode/local edit version of the VT102.**

TRANSMISSION SPECIFICATIONS

Transmission is asynchronous, in full-duplex mode (the VT102 and VT131 also support half-duplex mode); at speeds of 50, 75, 110, 134.5, 150, 200, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 9600, and 19,200 bits per second. The 7- or 8-bit ASCII code is used. Odd, even, mark, or no parity is selectable from the keyboard. Local echo is standard on the VT101, VT102, and VT131, and available on VT100s equipped with the printer port. An RS-232-C interface is standard; a 20 ma current loop interface is optional.

DEVICE CONTROL

On the VT100, VT101, VT102, and VT125, transmission is performed on a character-by-character basis as each key is depressed by the operator. On the VT131, data is stored in the terminal buffer as it is keyed. It is then transmitted in block form. The VT100 terminal memory is nonvolatile—feature settings are retained when the terminal is powered down.

The selection and storage of local terminal features is performed in Set-Up mode. When entering Set-Up mode, the status of the features stored in the temporary memory is shown on the screen. Features can be changed, and new features stored on a temporary basis by leaving Set-Up mode. The new features can be stored on a fixed basis by performing a save operation. If a recall operation is performed, the terminal is reset, or terminal power is turned off, all temporary settings are replaced by the features that have been stored on a fixed basis.

The VT100 family terminals are compatible with either of two different programming standards: ANSI, or Digital Equipment Corporation VT52. In ANSI mode, the VT100 terminals will respond to software based on ANSI standards. In VT52 mode, the terminals will respond to software written for use with Digital Equipment Corporation's older VT52 video display terminal.

In addition to selection of ANSI or VT52 mode, the following features can be selected when in Set-Up mode (note that not all features are available on all models); answerback message, full or fully duplex communications, host editing, local edit/block mode transmission, local echo, auto X-on/X-off, display format (80- or 132-column), on-line/local operation, new line, parity, parity sense, receive/transmit speeds, scroll, tabs, wraparound, character set (U.S., U.K., and special line drawing sets are standard on all models), cursor, key click, margin bell, screen background (normal or reverse), screen brightness, and auto repeat.

Cursor controls move the cursor up, down, left, right, home, and return. The cursor may be selected as either a blinking block or blinking underline.

Advanced Video Option provides dual intensity, blink, and underline functions in any combination with each other and with reverse video. This option also adds 10 additional 132-character display lines for a total of 24 lines. The Advanced Video Option also provides additional circuitry to add an alternate or custom character set in the future. Thus two character sets would reside in the terminal.

The VT100 provides composite video input and output. Composite video input permits the user to overlay video output from a remote terminal or processor without interfer-

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Digital Equipment Corporation VT100 Video Display Terminal Family

Feature	VT100	VT101	VT102	VT131	VT125
Base VT100 Features	Std.	Std.	Std.	Std.	Std.
Upgradable	Yes	No	No	No	Yes
Advanced Video Option (AVO)	Opt.	No	Std.	Std.	Opt.
Printer Port	Opt.	No	Std.	Std.	Std.
Local Echo	Opt.*	Std.	Std.	Std.	No
Full-duplex Communications	Yes	Yes	Yes	Yes	Yes
Half-duplex Communications	No	No	Yes	Yes	No
Modem Control Support	No	No	Yes	Yes	No
Host Editing	Opt.*	No	Yes	Yes	No
Block Mode Transmission/Local Editing	No	No	No	Yes	No
Bit Map Graphics	Opt.	No	No	No	Std.

With Printer Port.

USER REACTION

In Datapro's 1985 Terminal Users Survey, conducted in conjunction with *Data Communications* magazine, a total of 111 users responded with ratings for the VT100 family terminals. These users represented a total installed base of 7,975 units. Seventy-one of these users reported on their experiences with the VT100, totalling 6,096 installed terminals; the remaining 40 users reported on the various submodels of the VT100 family, covering 1,879 VT101, VT102, VT125, and VT131 terminals. The users were asked to rate their terminals with regard to seven separate categories. The ratings given to the VT100 family terminals by these users are summarized in the following tables:

VT100

	Excellent	Good	Fair	Poor	WA*
Overall performance	33	34	4	0	3.4
Ease of operation	33	31	5	0	3.4
Display clarity	23	38	6	2	3.2
Keyboard feel & usability	29	28	12	0	3.3
Ergonomics	8	18	31	10	2.4
Hardware reliability	31	30	5	3	3.3
Maintenance service/ technical support	28	26	9	4	3.2

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

Other VT100 family (VT101, VT102, VT125, VT131)

	Excellent	Good	Fair	Poor	WA*
Overall performance	15	24	1	0	3.4
Ease of operation	17	20	3	0	3.4
Display clarity	14	18	8	0	3.2
Keyboard feel & usability	18	16	5	0	3.3
Ergonomics	3	10	20	5	2.3
Hardware reliability	14	21	5	0	3.2
Maintenance service/ technical support	13	14	10	1	3.0

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

The users were also asked whether or not they would recommend the VT100 family terminals to other users. Overall, 83 users said that they would recommend them; 11 stated that they would not. The remaining users were undecided, or chose not to answer the question. □

ing with local usage. Composite video output permits the VT100 to drive an auxiliary monitor which is useful where data or text must be displayed to a group of people.

The VT125 directly executes Digital Equipment Corporation's general-purpose graphics descriptor, ReGIS (Remote Graphics Instruction Set), providing a bit map graphics capability, ReGIS allows the creation and storage of pictorial data as simple ASCII text. Graphics capabilities in the ReGIS firmware allow for the plotting of trend lines, bar charts, and pie charts. In engineering laboratory applications, point plot graphs and strip charts can be plotted. Digital Equipment Corporation makes available an upgrade kit to convert a VT100 to the VT125.

COMPONENTS

CRT DISPLAY UNIT: A 12-inch (diagonally measured) display screen is standard on all models. Characters are displayed in white (P4 Phosphor) on a dark background, and are formed utilizing a 7-by-9 dot matrix with descenders. The 96-character upper-/lowercase ASCII set is displayable. U.S., U.K., and line drawing character sets are standard on all models. The VT125 provides business graphics display.

The standard display format on the VT100, VT125, and VT101 is either 24 lines of 80 characters, or 14 lines of 132 characters. By adding the AVO to the VT100 and VT125, the 132-column format is increased to 24 lines. The AVO is standard on the VT102 and VT131; it is not available on the VT101.

Standard video attributes include normal or reverse video (full screen), double high/wide characters (line-by-line basis), and adjustable screen brightness. Terminals equipped with the AVO have these additional video attributes; bold, underline, blink, and reverse. These attributes can be selected on a character-by-character basis. The ABO also provides for alternate character sets to be mapped in a ROM and inserted into the terminal. These alternate characters can also be selected on a character-by-character basis.

In September 1981, Digital Equipment Corporation introduced two new options for the VT100 CRT. The first option is a tilt-and-swivel base, enabling the user to adjust the display for ease of viewing. The second new option is an antiglare filter kit for use with the display screen.

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Digital Equipment Corporation VT100 Video Display Terminal Family

KEYBOARD: A sculptured typewriter-style, detachable keyboard which is attached to the monitor via a 6-foot coiled cord. The keyboard contains 83 keys, including a 65-key main array and an 18-key numeric/function pad. The numeric pad includes four program function keys. Visual indicators on the keyboard include seven LEDs; three are dedicated to ON-LINE, LOCAL, and KDB LOCKED, and four are user-programmable. Audible signals include key click and bell.

PRICING

The VT100 family terminals are available for purchase only. Installation is priced at $150. Digital Equipment Corporation supports the terminals through its Field Service, available worldwide.

EQUIPMENT PRICES

	Purchase Price ($)	Monthly Maint. ($)
VT100	1,945	18
VT101	1,350	15
VT102	1,710	22
VT131	1,825	22
VT125	3,800	29
Options		
VT125 Upgrade Kit	1,800	—
Advanced Video Option (AVO)	180	—
Printer Port Option	350	—
20 ma Current Loop	140	—
Tilt-and-Swivel Base	89	—
Anti-Glare Filter Kit	60	—
VT18X Personal Computer Upgrade	1,295	—

■

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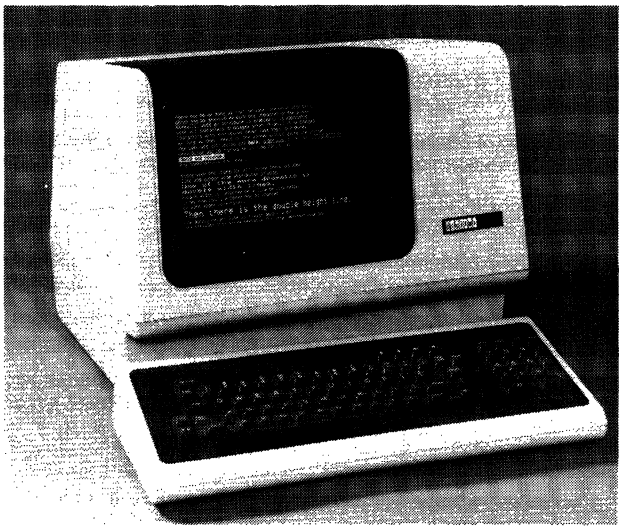
Digital Equipment Corporation (DEC) VT100 Video Display Terminal Family



Since its introduction in 1978, DEC has shipped over 500,000 VT100 terminals.

The VT100 Video Display Terminal is an acknowledged standard in the terminal industry. It is the most popular ASCII terminal ever produced, with over 500,000 units installed since its introduction in 1978. A large emulation market has sprung from the VT100.

MODELS: VT100, VT101, VT102, VT125, and VT131.
DISPLAY: All models feature a 12-inch (diagonal) display; characters are displayed in white. All models feature 80/132-column display capability.
KEYBOARD: All models feature a detachable keyboard with a typewriter-style layout.
COMPETITION: A large number of vendors provide VT100 emulators, including CIE Terminals, Visual Technology, Datamedia, Teleray, and Lear Siegler.
PRICE: Purchase prices range from $1,945 to $3,800.

MANAGEMENT SUMMARY

DEC's VT100 Video Display Terminal is the most successful, and most widely emulated, ASCII display terminal ever. The VT100 has created an emulation market that rivals the IBM 3270 market in size. According to DEC, over 500,000 VT100 terminals have been shipped since its introduction in 1978. The VT100 succeeded the company's earlier VT52 terminal; in November 1983, DEC introduced the VT200 Series of displays, which will eventually succeed the VT100. DEC has announced, however, that it will continue to manufacture the VT100 for at least the next two years.

In its basic configuration, the VT100 can display 24 lines of 80 characters, or 14 lines of 132 characters. Transmission is performed in character mode. Like all members of the family, the VT100 features a 12-inch (diagonal) display screen and detachable, typewriter-style keyboard. Other standard features include scrolling (jump or smooth), reverse video, variable screen brightness, audible key click, and auto repeat keys. The VT100 will support expanded capabilities and options. By adding the Advanced Video Option (AVO), the VT100 gains the following features: four alternate character attributes—bold, underline, blink, and reverse—which can be selected on a character-by-character basis; expanded display memory allowing for a display format of 24 lines by 132 characters; and provision for alternate character sets.

In 1981, DEC expanded the VT100 family by adding several submodels of the VT100. These included: the VT101, an entry-level model without the expansion capabilities of the VT100; the VT102, like the VT101, a non-expandable model, but including the Advanced Video Option and Printer Port Option; the VT131, a block mode>

CHARACTERISTICS

VENDOR: Digital Equipment Corporation (DEC), 146 Main Street, Maynard, MA 01754. Telephone (617) 897-5111.

DATE OF ANNOUNCEMENT: VT100—June 1978; VT125—July 1981; VT101, VT102, and VT131—September 1981.

DATE OF FIRST DELIVERY: VT100—September 1978; VT125—September 1981; VT101, VT102, and VT131—October 1981.

NUMBER DELIVERED TO DATE: Over 500,000.

SERVICED BY: Digital Equipment Corporation.

MODELS

The DEC VT100 terminals are stand-alone, desk-top units featuring a 12-inch (diagonal) display screen and a detachable, typewriter-style keyboard. The following models currently comprise the family:

- **VT100—The basic model. The unit is upgradable, and can be configured with the Advanced Video Option and the Printer Port Option.**
- **VT101—A non-upgradable, entry-level model; it contains all of the base features of the VT100, but will accept no options.**
- **VT102—Also non-upgradable, but contains all VT100 base features plus the AVO and Printer Port Option as standard features.**
- **VT131—The block mode/local edit version of the VT102.**

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Digital Equipment Corporation (DEC) VT100 Video Display Terminal Family

version of the VT102; and the VT125, a terminal with business graphics as well as alphanumeric capability. With the introduction of the VT200 series, DEC has placed these sub-models in "maintenance mode"; they will no longer be manufactured, but DEC will continue to supply them on an "as available" basis and to support them. It is likely, however, that these submodels will remain available for some time through DEC distributors; therefore, we will continue coverage in this report.

DEC also offers the option of converting the VT100 terminal into a personal computer through the addition of the VT18X Personal Computing Option. The VT18X kit consists of a Z80 microprocessor, 64K bytes of memory, dual 5¼-inch floppy disk drives, and installation hardware. The resulting VT180 Personal Computing Terminal features a CP/M operating system. The VT18X option is not available for models in the VT100 family other than the VT100 itself.

COMPETITIVE POSITION

As was mentioned earlier in this report, the DEC VT100 Video Display Terminal has achieved such widespread acceptance that it has spawned a sizable emulation market. Virtually every major general-purpose ASCII display terminal vendor includes a VT100 emulator in its product line. Advanced Resources Development, a market research firm, estimated 1982 shipments of VT100-type terminals at 155,000. Of these, approximately 50 percent were DEC units; the remainder were emulators from various vendors, including CIE Terminals, Visual Technology, Datamedia, Teleray, Ann Arbor, Micro-Term, and Lear Siegler. The new VT200 products should further strengthen this market, keeping it profitable for both DEC and its competitors.

ADVANTAGES AND RESTRICTIONS

The VT100 has achieved its high degree of success despite the fact that, traditionally, it has carried a price tag that has been somewhat high for the ASCII terminal market. The functions available on the VT100 (particularly the full-screen 132-column display capability) are not always available from less expensive imitators, and obviously offset the higher price. DEC, with the introduction of the VT200 terminals, has moved to close the price/performance gap that competitors have used to obtain a share of this market.

USER REACTION

In Datapro's 1983 Terminal Users Survey, conducted in conjunction with *Data Communications* magazine, a total of 73 users responded with ratings for the VT100 family terminals. These users represented a total installed base of 13,040 units. Fifty-three of these users reported on their experiences with the VT100, totalling 12,362 installed terminals; the remaining 20 users reported on the various submodels of the VT100 family, covering 678 VT101, VT102, VT125, VT131, and VT132 (discontinued) terminals. The users were asked to rate their terminals with regard to seven separate categories. The ratings given to the VT100 family terminals by these users are summarized in the following tables:

- **VT125—Contains all of the features of the VT100, plus a business graphics capability. The VT100 can be upgraded to the VT125 via the VT125 upgrade kit.**

TRANSMISSION SPECIFICATIONS

Transmission is asynchronous, in full-duplex mode (the VT102 and VT131 also support half-duplex mode); at speeds of 50, 75, 110, 134.5, 150, 200, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 9600, and 19,200 bits per second. The 7- or 8-bit ASCII code is used. Odd, even, mark, or no parity is selectable from the keyboard. Local echo is standard on the VT101, VT102, and VT131, and available on VT100s equipped with the printer port. An RS-232-C interface is standard; a 20mA current loop interface is optional.

DEVICE CONTROL

On the VT100, VT101, VT102, and VT125, transmission is performed on a character-by-character basis as each key is depressed by the operator. On the VT131, data is stored in the terminal buffer as it is keyed. It is then transmitted in block form. The VT100 terminal memory is non-volatile—feature settings are retained when the terminal is powered down.

The selection and storage of local terminal features is performed in Set-Up mode. When entering Set-Up mode, the status of the features stored in the temporary memory is shown on the screen. Features can be changed, and new features stored on a temporary basis by leaving Set-Up mode. The new features can be stored on a fixed basis by performing a save operation. If a recall operation is performed, the terminal is reset, or terminal power is turned off, all temporary settings are replaced by the features that have been stored on a fixed basis.

The VT100 family terminals are compatible with either of two different programming standards: ANSI, or DEC VT52. In ANSI mode, the VT100 terminals will respond to software based on ANSI standards. In VT52 mode, the terminals will respond to software written for use with DEC's older VT52 video display terminal.

In addition to selection of ANSI or VT52 mode, the following features can be selected when in Set-Up mode (note that not all features are available on all models): answerback message, full- or half-duplex communications, host editing, local edit/block mode transmission, local echo, auto X–on/X–off, display format (80 or 132 column), on–line/local operation, new line, parity, parity sense, receive/transmit speeds, scroll, tabs, wraparound, character set (U.S., U.K. and special line drawing sets are standard on all models), cursor, key click, margin bell, screen background (normal or reverse), screen brightness, and auto repeat.

Cursor controls move the cursor up, down, left, right, home, and return. The cursor may be selected as either a blinking block or blinking underline.

Advanced Video Option provides dual intensity, blink and underline functions in any combination with each other and with reverse video. This option also adds 10 additional 132-character display lines for a total of 24 lines. The Advanced Video Option also provides additional circuitry to add an alternate or custom character set in the future. Thus two character sets would reside in the terminal.

The VT100 provides composite video input and output. Composite video input permits the user to overlay video output from a remote terminal or processor without interfering with local usage. Composite video output permits the VT100 to drive an auxiliary monitor which is useful where data or text must be displayed to a group of people.

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Digital Equipment Corporation (DEC) VT100 Video Display Terminal Family

TABLE 1. VT100 FEATURE COMPARISON

Feature	VT100	VT101	VT102	VT131	VT125
Base VT100 Features	Std.	Std.	Std.	Std.	Std.
Upgradable	Yes	No	No	No	Yes
Advanced Video Option (AVO)	Opt.	No	Std.	Std.	Opt.
Printer Port	Opt.	No	Std.	Std.	Std.
Local Echo	Opt.*	Std.	Std.	Std.	No
Full-duplex Communications	Yes	Yes	Yes	Yes	Yes
Half-duplex Communications	No	No	Yes	Yes	No
Modem Control Support	No	No	Yes	Yes	No
Host Editing	Opt.*	No	Yes	Yes	No
Block Mode Transmission/Local Editing	No	No	No	Yes	No
Bit Map Graphics	Opt.	No	No	No	Std.

*With Printer Port.

VT100

	Excellent	Good	Fair	Poor	WA*
Overall performance	35	12	2	0	3.7
Ease of operation	27	20	3	1	3.4
Display clarity	22	25	4	0	3.4
Keyboard feel & usability	15	31	6	0	3.2
Ergonomics	12	31	9	0	3.1
Hardware reliability	11	34	6	1	3.1
Maintenance service/ technical support	24	20	3	1	3.4

Other VT100 family (VT101, VT102, VT131, VT125)

	Excellent	Good	Fair	Poor	WA*
Overall performance	13	5	0	0	3.7
Ease of operation	10	10	0	0	3.5
Display clarity	12	7	1	0	3.6
Keyboard feel & usability	10	7	3	0	3.4
Ergonomics	5	12	1	1	3.1
Hardware reliability	8	8	4	0	3.2
Maintenance service/ technical support	10	8	1	0	3.5

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

The users were also asked whether or not they would recommend the DEC terminals to other users. Overall, 62 users said that they would recommend them; 6 stated that they would not. The remaining users were undecided, or chose not to answer the question. □

The VT125 directly executes DEC's general purpose graphics descriptor, ReGIS (Remote Graphics Instruction Set), providing a bit map graphics capability. ReGIS allows the creation and storage of pictorial data as simple ASCII text. Graphics capabilities in the ReGIS firmware allow for the plotting of trend lines, bar charts, and pie charts. In engineering laboratory applications, point plot graphs and strip charts can be plotted. DEC makes available an upgrade kit to convert a VT100 to the VT125.

COMPONENTS

CRT DISPLAY UNIT: A 12-inch (diagonally measured) display screen is standard on all models. Characters are displayed in white (P4 phosphor) on a dark background, and are formed utilizing a 7 x 9 dot matrix with descenders. The 96-character upper/lower case ASCII set is displayable. U.S., U.K., and line drawing character sets are standard on all models. The VT125 provides business graphics display.

The standard display format on the VT100, VT125, and VT101 is either 24 lines of 80 characters, or 14 lines of 132 characters. By adding the AVO to the VT100 and VT125, the 132-column format is increased to 24 lines. The AVO is standard on the VT102 and VT131; it is not available on the VT101.

Standard video attributes include normal or reverse video (full screen), double high/wide characters (line-by-line basis), and adjustable screen brightness. Terminals equipped with the AVO have these additional video attributes; bold, underline, blink, and reverse. These attributes can be selected on a character-by-character basis. The AVO also provides for alternate character sets to be mapped in a ROM and inserted into the terminal. These alternate characters can also be selected on a character-by-character basis.

In September 1981, DEC introduced two new options for the VT100 CRT. The first option is a tilt-and-swivel base, enabling the user to adjust the display for ease of viewing. The second new option is an anti-glare filter kit for use with the display screen.

KEYBOARD: A sculptured typewriter-style, detachable keyboard which is attached to the monitor via a 6-foot coiled cord. The keyboard contains 83 keys, including a 65-key main array and an 18-key numeric/function pad. The numeric pad includes four program function keys. Visual indicators on the keyboard include seven LEDs; three are dedicated to ON-LINE, LOCAL, and KBD LOCKED, and four are user-programmable. Audible signals include key click and bell.

PRICING

The VT100 family terminals are available for purchase only. Installation is priced at $150. DEC supports the terminals through its Field Service, available worldwide.

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Digital Equipment Corporation (DEC) VT100 Video Display Terminal Family

	Purchase Price	Monthly Maint.
VT100	$1,945	$18
VT101	1,350	15
VT102	1,710	22
VT131	1,825	22
VT125	3,800	29
Options		
VT125 Upgrade Kit	1,800	—
Advanced Video Option (AVO)	180	—
Printer Port Option	350	—
20mA Current Loop	140	—
Tilt-and-Swivel Base	89	—
Anti-Glare Filter Kit	60	—
VT18X Personal Computer Upgrade	1,295	—

■

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Digital Equipment Corporation (DEC) VT100 Video Display Terminal Family

DEC's VT125 features business graphics, as well as alphanumeric, capabilities. Using DEC's Remote Graphics Instruction Set (ReGIS), pictorial data is created and stored as simple ASCII text. An upgrade kit is available to enable a standard VT100 to be configured with the graphics capabilities of the VT125.

The VT100 Video Display Terminal is the single most widely emulated ASCII terminal on the market today. Introduced in 1978, the VT100 has been joined in DEC's VT video display family by a wide variety of models for various applications. This report covers only those models in the VT100 family which are designed for general-purpose business use.

Five models currently comprise the VT100 family: the VT100, which is the basic model; the VT101, an entry-level model without the expansion capabilities of the VT100; the VT102, like the VT101, a non-expandable model, but including the Advanced Video Option (AVO) and Printer Port Option; the VT131, a block-mode version of the VT102; and the VT125, which has business graphics capabilities.

In its basic configuration, the VT100 can display 24 lines of 80 characters, or 14 lines of 132 characters. Transmission is performed in character mode. Like all members of the family, the VT100 features a 12-inch (diagonal) display screen and detachable, typewriter-style keyboard. Other standard features include scrolling (jump or smooth), reverse video, variable screen brightness, audible key click, and auto repeat keys. The VT100 will support expanded capabilities and options. By adding the Advanced Video Option, the VT100 gains the following features: four alternate character attributes—bold, underline, blink, and reverse—which can be selected on a character-by-character basis; expanded display memory allowing for a display format of 24 lines by 132 characters; and provision for alternate character sets.

DEC's popular line of ASCII display terminals.

All models feature an 80/132-column display. Other standard features include a 12-inch (diagonal) display screen and a detachable, typewriter-style keyboard. Features available with some of the models include the Advanced Video Option (AVO), printer port, and business graphics capability. Character and block mode transmission versions are available, and some models have upgrade capability.

Purchase prices for the VT100 terminals range from $1,350 to $3,800.

CHARACTERISTICS

VENDOR: Digital Equipment Corporation (DEC), 146 Main Street, Maynard, MA 01754. Telephone (617) 897-5111.

DATE OF ANNOUNCEMENT: VT100—June 1978; VT125—July 1981; VT101, VT102, and VT131—September 1981.

DATE OF FIRST DELIVERY: VT100—September 1978; VT125—September 1981; VT101, VT102, and VT131—October 1981.

NUMBER DELIVERED TO DATE: Information not available.

SERVICED BY: Digital Equipment Corporation.

MODELS

The DEC VT100 terminals are stand-alone, desk-top units featuring a 12-inch (diagonal) display screen and a detachable, typewriter-style keyboard. The following models currently comprise the family:

- **VT100—The basic model. The unit is upgradeable, and can be configured with the Advanced Video Option and the Printer Port Option.**
- **VT101—A non-upgradeable, entry-level model; it contains all of the base features of the VT100, but will accept no options.**
- **VT102—Also non-upgradeable, but contains all VT100 base features plus the AVO and Printer Port Option as standard features.**
- **VT131—The block mode/local edit version of the VT102.**
- **VT125—Contains all of the features of the VT100, plus a business graphics capability. The VT100 can be upgraded to the VT125 via the VT125 upgrade kit.**

TRANSMISSION SPECIFICATIONS

Transmission is asynchronous, in full-duplex mode (the VT102 and VT131 also support half-duplex mode); at

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Digital Equipment Corporation (DEC) VT100 Video Display Terminal Family

The three newest members of the VT100 family—the VT101, VT102, and VT131—were introduced in September 1981. Unlike the VT100, these models are non-expandable; they cannot be upgraded as user needs change. The VT101 is an entry-level model which contains all of the base features of the VT100, plus local echo. The VT102 adds the AVO and Printer Port Option as standard. The VT131 is a block mode version of the VT102.

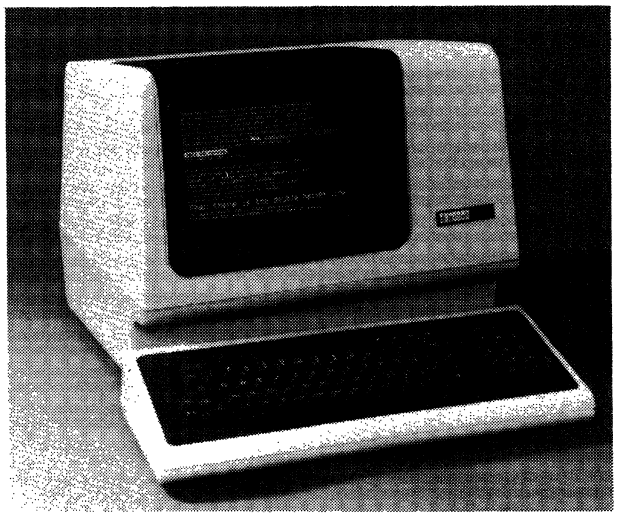
The VT125 provides the functionality of the VT100 along with a business graphics capability. The VT125 utilizes DEC's graphics instruction set, ReGIS (Remote Graphics Instruction Set). In addition to alphanumerics, the unit can plot trend lines, bar charts, and pie charts. A VT125 upgrade kit is available for the VT100.

For applications requiring hard copy of the screen contents, DEC supplies the DECwriter III and DECwriter IV Printer Terminals.

DEC also offers the option of converting the VT100 terminal into a personal computer through the addition of the VT18X Personal Computing Option. The VT18X kit consists of a Z80 microprocessor, 64K bytes of memory, dual 5¼-inch floppy disk drives, and installation hardware. The resulting VT180 Personal Computing Terminal features a CP/M operating system. The VT18X option is not available for models in the VT100 family other than the VT100 itself.

USER REACTION

During June, July, and August of 1982, Datapro, in conjunction with *Data Communications* magazine, conducted the first Terminal Users Survey. A questionnaire, designed by Datapro, was mailed to approximately



The DEC VT100 is one of the most popular, as well as one of the most widely emulated, video display terminals on the market today. When equipped with the Advanced Video Option, the terminal can display 24 lines of 80 or 132 characters, and features video attributes such as bold, blink, underline, and reverse on a character-by-character basis.

speeds of 50, 75, 110, 134.5, 150, 200, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 9600, and 19,200 bits per second. The 7- or 8-bit ASCII code is used. Odd, even, mark, or no parity is selectable from the keyboard. Local echo is standard on the VT101, VT102, and VT131, and available on VT100s equipped with the printer port. An RS-232-C interface is standard; a 20mA current loop interface is optional.

DEVICE CONTROL

On the VT100, VT101, VT102, and VT125, transmission is performed on a character-by-character basis as each key is depressed by the operator. On the VT131, data is stored in the terminal buffer as it is keyed. It is then transmitted in block form. The VT100 terminal memory is non-volatile—feature settings are retained when the terminal is powered down.

The selection and storage of local terminal features is performed in Set-Up mode. When entering Set-Up mode, the status of the features stored in the temporary memory is shown on the screen. Features can be changed, and new features stored on a temporary basis by leaving Set-Up mode. The new features can be stored on a fixed basis by performing a save operation. If a recall operation is performed, the terminal is reset, or terminal power is turned off, all temporary settings are replaced by the features that have been stored on a fixed basis.

The VT100 family terminals are compatible with either of two different programming standards: ANSI, or DEC VT52. In ANSI mode, the VT100 terminals will respond to software based on ANSI standards. In VT52 mode, the terminals will respond to software written for use with DEC's older VT52 video display terminal.

In addition to selection of ANSI or VT52 mode, the following features can be selected when in Set-Up mode (note that not all features are available on all models): answerback message, full- or half-duplex communications, host editing, local edit/block mode transmission, local echo, auto X-on/X-off, display format (80 or 132 column), on-line/local operation, new line, parity, parity sense, receive/transmit speeds, scroll, tabs, wraparound, character set (U.S., U.K. and special line drawing sets are standard on all models), cursor, key click, margin bell, screen background (normal or reverse), screen brightness, and auto repeat.

Cursor controls move the cursor up, down, left, right, home, and return. The cursor may be selected as either a blinking block or blinking underline.

Advanced Video Option provides dual intensity, blink and underline functions in any combination with each other and with reverse video. This option also adds 10 additional 132-character display lines for a total of 24 lines. The Advanced Video Option also provides additional circuitry to add an alternate or custom character set in the future. Thus two character sets would reside in the terminal.

The VT100 provides composite video input and output. Composite video input permits the user to overlay video output from a remote terminal or processor without interfering with local usage. Composite video output permits the VT100 to drive an auxiliary monitor which is useful where data or text must be displayed to a group of people.

The VT125 directly excutes DEC's general purpose graphics descriptor, ReGIS (Remote Graphics Instruction Set), providing a bit map graphics capability. ReGIS allows the creation and storage of pictorial data as simple ASCII text. Graphics capabilities in the ReGIS firmware allow for the plotting of trend lines, bar charts, and pie charts. In engineering laboratory applications, point plot graphs and

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Digital Equipment Corporation (DEC) VT100 Video Display Terminal Family

TABLE 1. VT100 FEATURE COMPARISON

Feature	VT100	VT101	VT102	VT131	VT125
Base VT100 Features	Std.	Std.	Std.	Std.	Std.
Upgradeable	Yes	No	No	No	Yes
Advanced Video Option (AVO)	Opt.	No	Std.	Std.	Opt.
Printer Port	Opt.	No	Std.	Std.	Std.
Local Echo	Opt.*	Std.	Std.	Std.	No
Full-duplex Communications	Yes	Yes	Yes	Yes	Yes
Half-duplex Communications	No	No	Yes	Yes	No
Modem Control Support	No	No	Yes	Yes	No
Host Editing	Opt.*	No	Yes	Yes	No
Block Mode Transmission/Local Editing	No	No	No	Yes	No
Bit Map Graphics	Opt.	No	No	No	Std.

*With Printer Port.

10,000 addresses selected at random from *Data Communications'* U.S. end-user subscriber base. A total of 60 users of DEC VT100 family terminals responded to the survey. Breaking the responses down by model yielded the following totals: 47 of the users reported on their experiences with the VT100, representing an installed base of 2,193 terminals (an average of 47 terminals per user); and 13 of the users responded on the newer members of the VT100 family, including the VT101, VT102, VT125, and VT131, representing an installed base of 569 units (an average of 44 terminals per user). The users were asked to rate the terminals with regard to six separate categories. The ratings given to the VT100 family terminals by these users are detailed in the following tables:

VT100

	Excellent	Good	Fair	Poor	WA*
Overall performance	31	15	1	0	3.6
Ease of operation	26	19	2	0	3.5
Display clarity	20	20	6	1	3.3
Keyboard feel & usability	19	23	5	0	3.3
Hardware reliability	22	22	3	0	3.4
Maintenance service/ technical support	15	19	8	4	3.0

Other VT100 family (VT101, VT102, VT131, VT125)

	Excellent	Good	Fair	Poor	WA*
Overall performance	2	11	0	0	3.2
Ease of operation	2	10	1	0	3.1
Display clarity	3	8	2	0	3.1
Keyboard feel & usability	5	5	3	0	3.2
Hardware reliability	2	7	3	0	2.9
Maintenance service/ technical support	3	4	4	0	2.9

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

The users were also asked whether or not they would recommend the DEC terminals to other users. Of the VT100 users, 38 responded that they would recommend them, while 2 stated that they would not; the remaining 7 users were either undecided or did not respond to that question. Of the other VT100 family member users, 8 responded that they would recommend their terminals, 2 said that they would not, and the remaining three were undecided or did not respond.□

strip charts can be plotted. DEC makes available an upgrade kit to convert a VT100 to the VT125.

COMPONENTS

CRT DISPLAY UNIT: A 12-inch (diagonally measured) display screen is standard on all models. Characters are displayed in white (P4 phosphor) on a dark background, and are formed utilizing a 7 x 9 dot matrix with descenders. The 96-character upper/lower case ASCII set is displayable. U.S., U.K., and line drawing character sets are standard on all models. The VT125 provides business graphics display.

The standard display format on the VT100, VT125, and VT101 is either 24 lines of 80 characters, or 14 lines of 132 characters. By adding the AVO to the VT100 and VT125, the 132-column format is increased to 24 lines. The AVO is standard on the VT102 and VT131; it is not available on the VT101.

Standard video attributes include normal or reverse video (full screen), double high/wide characters (line-by-line basis), and adjustable screen brightness. Terminals equipped with the AVO have these additional video attributes: bold, underline, blink, and reverse. These attributes can be selected on a character-by-character basis. The AVO also provides for alternate character sets to be mapped in a ROM and inserted into the terminal. These alternate characters can also be selected on a character-by-character basis.

In September 1981, DEC introduced two new options for the VT100 CRT. The first option is a tilt-and-swivel base, enabling the user to adjust the display for ease of viewing. The second new option is an anti-glare filter kit for use with the display screen.

KEYBOARD: A sculptured typewriter-style, detachable keyboard which is attached to the monitor via a 6-foot coiled cord. The keyboard contains 83 keys, including a 65-key main array and an 18-key numeric/function pad. The numeric pad includes four program function keys. Visual indicators on the keyboard include seven LEDs; three are dedicated to ON-LINE, LOCAL, and KBD LOCKED, and four are user-programmable. Audible signals include key click and bell.

PRICING

The VT100 family terminals are available for purchase only. Installation is priced at $150. DEC supports the terminals through its Field Service, available worldwide.

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Digital Equipment Corporation (DEC) VT100 Video Display Terminal Family

	Purchase Price	Monthly Maint.
VT100	$1,945	$18
VT101	1,350	15
VT102	1,710	22
VT131	1,825	22
VT125	3,800	29
Options		
VT125 Upgrade Kit	1,800	—
Advanced Video Option (AVO)	180	—
Printer Port Option	350	—
20mA Current Loop	140	—
Tilt-and-Swivel Base	89	—
Anti-Glare Filter Kit	60	—
VT18X Personal Computer Upgrade	1,295	—■

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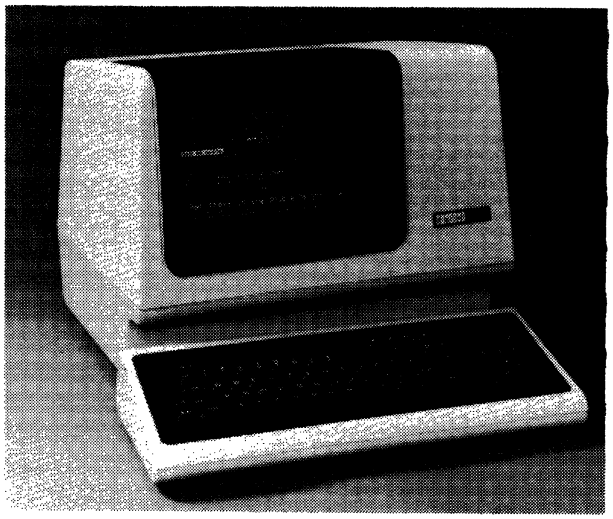
Digital Equipment Corporation (DEC) VT100 Video Display Terminal Family



The DEC VT100 is one of the most popular, as well as one of the most widely emulated, video display terminals on the market today. When equipped with the Advanced Video Option, the terminal can display 24 lines of 80 or 132 characters, and features video attributes such as bold, blink, underline, and reverse on a character-by-character basis.

A family of stand-alone ASCII display terminals, headed by the widely-emulated VT100.

All models feature an 80/132-column display. Other standard features include a 12-inch (diagonal) display screen and a detachable, typewriter-style keyboard. Features available with some of the models include the Advanced Video Option (AVO), printer port, and business graphics capability. Character and block mode transmission versions are available, and some models have upgrade capability.

Purchase prices for the VT100 terminals range from $2,150 to $3,800.

MANAGEMENT SUMMARY

Digital Equipment Corporation's VT100 Video Display Terminal is the single most widely emulated ASCII terminal on the market today. Introduced in 1978, the VT100 replaced the company's older VT52 terminal. Initially, production problems with the VT100 caused a delivery lag, with DEC unable to supply its distributors with enough units. This situation was viewed as an opportunity by many independent terminal manufacturers, who entered the DEC market with VT100 emulators. After several months, however, DEC resolved its problems, and the company is now in full production and able to meet its delivery schedules on time.

Six models currently comprise the VT100 family: the VT100, which is the basic model; the VT132, which is a block-mode version of the VT100; the VT101, an entry-level model without the expansion capabilities of the VT100; the VT102, like the VT101, a non-expandable model, but including the Advanced Video Option (AVO) and Printer Port Option; the VT131, a block-mode version of the VT102; and the VT125, which has business graphics capabilities.

In its basic configuration, the VT100 can display 24 lines of 80 characters, or 14 lines of 132 characters. Transmission is performed in character mode. Like all members of the family, the VT100 features a 12-inch (diagonal) display screen and detachable, typewriter-style keyboard. Other standard features include scrolling (jump or smooth), reverse video, variable screen brightness, audible key click, and auto repeat keys. The ▷

CHARACTERISTICS

VENDOR: Digital Equipment Corporation (DEC), 146 Main Street, Maynard, MA 01754. Telephone (617) 897-5111.

DATE OF ANNOUNCEMENT: VT100—June 1978; VT132—June 1978; VT125—July 1981; VT101, VT102, and VT131—September 1981.

DATE OF FIRST DELIVERY: VT100—September 1978; VT132—December 1980; VT125—September 1981; VT101, VT102, and VT131—October 1981.

NUMBER DELIVERED TO DATE: Information not available.

SERVICED BY: Digital Equipment Corporation.

MODELS

The DEC VT100 terminals are stand-alone, desk-top units featuring a 12-inch (diagonal) display screen and a detachable, typewriter-style keyboard. The following models currently comprise the family:

- **VT100—The basic model. The unit is upgradeable, and can be configured with the Advanced Video Option and the Printer Port Option.**
- **VT132—The block mode/local edit version of the VT100.**
- **VT101—A non-upgradeable, entry-level model; it contains all of the base features of the VT100, but will accept no options.**
- **VT102—Also non-upgradeable, but contains all VT100 base features plus the AVO and Printer Port Option as standard features.**
- **VT131—The block mode/local edit version of the VT102.**
- **VT125—Contains all of the features of the VT100, plus a business graphics capability. The VT100 can be upgraded to the VT125 via the VT125 upgrade kit.** ▶

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Digital Equipment Corporation (DEC) VT100 Video Display Terminal Family

VT100 will support expanded capabilities and options. By adding the Advanced Video Option, the VT100 gains the following features: four alternate character attributes—bold, underline, blink, and reverse—which can be selected on a character-by-character basis; expanded display memory allowing for a display format of 24 lines by 132 characters; and provision for alternate character sets. The VT132 has all of the features of the VT100, but it allows for block mode transmission and permits local editing (block mode transmission is not supported on DEC systems).

The three newest members of the VT100 family—the VT101, VT102, and VT131—were introduced in September 1981. Unlike the VT100 and VT132, these models are non-expandable; they cannot be upgraded as user needs change. The VT101 is an entry-level model which contains all of the base features of the VT100, plus local echo. The VT102 adds the AVO and Printer Port Option as standard. The VT131 is a block mode version of the VT102.

The VT125 provides the functionality of the VT100 along with a business graphics capability. The VT125 utilizes DEC's graphics instruction set, ReGIS (Remote Graphics Instruction Set). In addition to alphanumerics, the unit can plot trend lines, bar charts, and pie charts. A VT125 upgrade kit is available for the VT100.

For applications requiring hard copy of the screen contents, DEC supplies the DECwriter III and DECwriter IV Printer Terminals. See reports C27-384-201 and C27-384-301, respectively, for information on these products.

USER REACTION

In the 1981 survey of alphanumeric display terminal users, Datapro received responses from six users of the DEC VT100 video display terminal. These users reported on their experiences with a total of 41 terminals. Their ratings are as follows:

	Excellent	Good	Fair	Poor	WA*
Overall performance	5	1	0	0	3.8
Ease of operation	4	1	1	0	3.5
Display clarity	4	2	0	0	3.7
Keyboard feel & usability	4	2	0	0	3.7
Hardware reliability	4	2	0	0	3.7
Maintenance service	3	1	1	0	3.4
Technical support	3	3	0	0	3.5

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

As in the 1980 survey, the ratings given the VT100 terminals were consistently high. Typical applications mentioned by the respondents included program development (5 users), data entry (4 users), intracompany message transmission (2 users), and text editing (2 users).□

TRANSMISSION SPECIFICATIONS

Transmission is asynchronous, in full-duplex mode (the VT102 and VT131 also support half-duplex mode); at speeds of 50, 75, 110, 134.5, 150, 200, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 9600, and 19,200 bits per second. The 7- or 8-bit ASCII code is used. Odd, even, mark, or no parity is selectable from the keyboard. Local echo is standard on the VT101, VT102, and VT131, and available on VT100s and VT132s equipped with the printer port. An RS-232-C interface is standard; a 20mA current loop interface is optional.

DEVICE CONTROL

On the VT100, VT101, VT102, and VT125, transmission is performed on a character-by-character basis as each key is depressed by the operator. On the VT131 and VT132, data is stored in the terminal buffer as it is keyed. It is then transmitted in block form. The VT100 terminal memory is non-volatile—feature settings are retained when the terminal is powered down.

The selection and storage of local terminal features is performed in Set-Up mode. When entering Set-Up mode, the status of the features stored in the temporary memory is shown on the screen. Features can be changed, and new features stored on a temporary basis by leaving Set-Up mode. The new features can be stored on a fixed basis by performing a save operation. If a recall operation is performed, the terminal is reset, or terminal power is turned off, all temporary settings are replaced by the features that have been stored on a fixed basis.

The VT100 family terminals are compatible with either of two different programming standards: ANSI, or DEC VT52. In ANSI mode, the VT100 terminals will respond to software based on ANSI standards. In VT52 mode, the terminals will respond to software written for use with DEC's older VT52 video display terminal.

In addition to selection of ANSI or VT52 mode, the following features can be selected when in Set-Up mode (note that not all features are available on all models): answerback message, full- or half-duplex communications, host editing, local edit/block mode transmission, local echo, auto XON/OFF, display format (80 or 132 column), on-line/local operation, new line, parity, parity sense, bit map graphics, receive/transmit speeds, scroll, tabs, wraparound, character set (U.S., U.K. and special line drawing sets are standard on all models), cursor, key click, margin bell, screen background (normal or reverse), screen brightness, and auto repeat.

Cursor controls move the cursor up, down, left, right, home, and return. The cursor may be selected as either a blinking block or blinking underline.

Advanced Video Option provides dual intensity, blink and underline functions in any combination with each other and with reverse video. This option also adds 10 additional 132-character display lines for a total of 24 lines. The Advanced Video Option also provides additional circuitry to add an alternate or custom character set in the future. Thus two character sets would reside in the terminal.

The VT100 provides composite video input and output. Composite video input permits the user to overlay video output from a remote terminal or processor without interfering with local usage. Composite video output permits the VT100 to drive an auxiliary monitor which is useful where data or text must be displayed to a group of people.

The VT125 directly excutes DEC's general purpose graphics descriptor, ReGIS (Remote Graphics Instruction Set),

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Digital Equipment Corporation (DEC) VT100 Video Display Terminal Family

TABLE 1. VT100 FEATURE COMPARISON

Feature	VT100	VT132	VT101	VT102	VT131	VT125
Base VT100 Features	Std.	Std.	Std.	Std.	Std.	Std.
Upgradeable	Yes	Yes	No	No	No	Yes
Advanced Video Option (AVO)	Opt.	Opt.	No	Std.	Std.	Opt.
Printer Port	Opt.	Opt.	No	Std.	Std.	Std.
Local Echo	Opt.*	Opt.*	Std.	Std.	Std.	No
Full-duplex Communications	Yes	Yes	Yes	Yes	Yes	Yes
Half-duplex Communications	No	No	No	Yes	Yes	No
Modem Control Support	No	No	No	Yes	Yes	No
Host Editing	Opt.*	Opt.*	No	Yes	Yes	No
Block Mode Transmission/Local Editing	No	Yes	No	No	Yes	No
Bit Map Graphics	Opt.	No	No	No	No	Std.

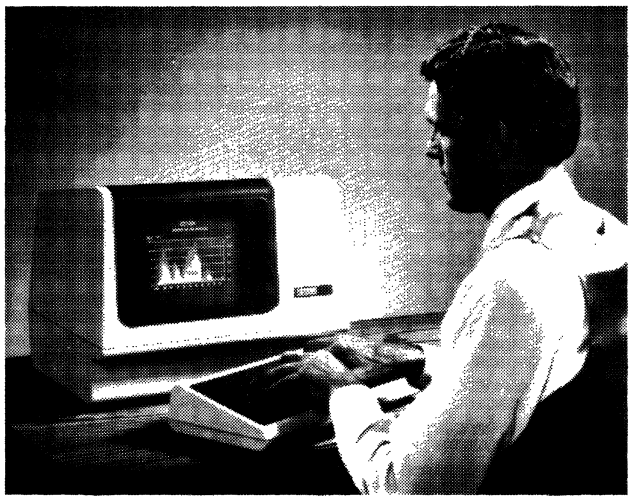
*With Printer Port.

providing a bit map graphics capability. ReGIS allows the creation and storage of pictorial data as simple ASCII text. Graphics capabilities in the ReGIS firmware allow for the plotting of trend lines, bar charts, and pie charts. In engineering laboratory applications, point plot graphs and strip charts can be plotted. DEC makes available an upgrade kit to convert a VT100 to the VT125.

COMPONENTS

CRT DISPLAY UNIT: A 12-inch (diagonally measured) display screen is standard on all models. Characters are displayed in white (P4 phosphor) on a dark background, and are formed utilizing a 7 x 9 dot matrix with descenders. The 96-character upper/lower case ASCII set is displayable. U.S., U.K., and line drawing character sets are standard on all models. The VT125 provides business graphics display.

The standard display format on the VT100, VT132, VT125, and VT101 is either 24 lines of 80 characters, or 14 lines of 132 characters. By adding the AVO to the VT100, VT125, and VT132, the 132-column format is increased to 24 lines. The AVO is standard on the VT102 and VT131; it is not available on the VT101.



The VT125 features business graphics, as well as alphanumeric, capabilities. Using DEC's Remote Graphics Instruction Set (ReGIS), pictorial data is created and stored as simple ASCII text.

Standard video attributes include normal or reverse video (full screen), double high/wide characters (line-by-line basis), and adjustable screen brightness. Terminals equipped with the AVO have these additional video attributes: bold, underline, blink, and reverse. These attributes can be selected on a character-by-character basis. The AVO also provides for alternate character sets to be mapped in a ROM and inserted into the terminal. These alternate characters can also be selected on a character-by-character basis.

In September 1981, DEC introduced two new options for the VT100 CRT. The first option is a tilt-and-swivel base, enabling the user to adjust the display for ease of viewing. The second new option is an anti-glare filter kit for use with the display screen.

KEYBOARD: A sculptured typewriter-style, detachable keyboard which is attached to the monitor via a 6-foot coiled cord. The keyboard contains 83 keys, including a 65-key main array and an 18-key numeric/function pad. The numeric pad includes four program function keys. Visual indicators on the keyboard include seven LEDs; three are dedicated to ON-LINE, LOCAL, and KBD LOCKED, and four are user-programmable. Audible signals include key click and bell.

PRICING

The VT100 family terminals are available for purchase only. Installation is priced at $150. DEC supports the terminals through its Field Service, available worldwide.

	Purchase Price	Monthly Maint.
VT100	$2,150	$18
VT132	2,575	18
VT101	2,150	15
VT102	2,400	22
VT131	2,450	22
VT125	3,800	29
Options		
VT125 Upgrade Kit	2,000	—
Advanced Video Option (AVO)	150	—
Printer Port Option	225	—
20mA Current Loop	140	—
Tilt-and-Swivel Base	89	—
Anti-Glare Filter Kit	60	— ■

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Digital Equipment Corporation VT-100 Video Display Terminal

MANAGEMENT SUMMARY

The VT-100 is an advanced function CRT display designed to supersede the DEC VT 52 while remaining compatible with it. In terms of the DEC product line, the VT-100 is a terminal for sale to OEM accounts; it is a display terminal which can be sold on DEC systems; and it forms the base of the PDT-11 terminal line, a user programmable family of terminals compatible with the PDP-11 series of computers.

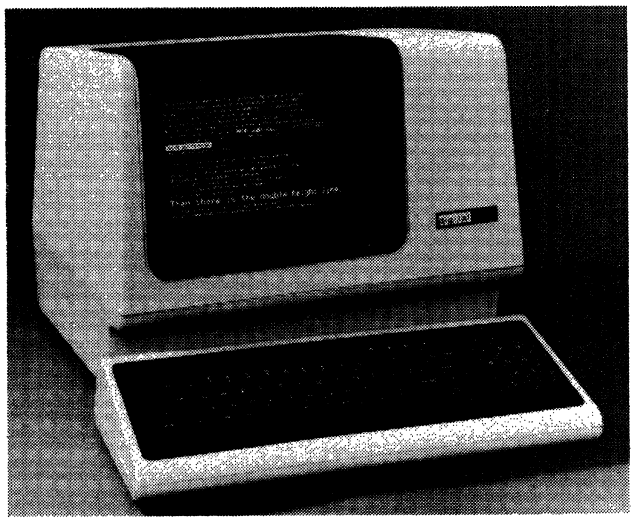
The standard VT-100 can display 24 lines of 80 characters or 14 lines of 132 characters. An optional advanced video function provides an additional 10 lines of 132 characters. Characters are formed in a 7 x 9 matrix with upper/lower case displayed either as white on black or black on white.

The VT-100 has two mechanical switches, one for controlling the power supply and the other for turning the terminal on and off. All functions, (setting tab stops, transmission rates, parity, etc.) are set via the operator's keyboard. The keyboard is detached and connected to the display by means of a six-foot coil cord.

A printer port option has recently been added to the VT-100. This option enables a hard copy printer (including the DECprinter III and the DECwriter IV) to be attached.

USER REACTION

In the 1980 survey of alphanumeric display terminal users. Datapro received responses from 10 users of the DEC VT-100 display terminal. These users reported on their experiences with 23 installed units. Their ratings are as follows:



A stand-alone teletype compatible display terminal capable of displaying either 80 or 132 characters per line. Standard features include detached keyboard, reverse video, split screen addressable cursor, selectable transmission rates, and parity.

An optional advanced video function provides full 24-line x 132-character screen capacity; blink, underline and dual intensity in any combination; and provision for storing an alternate or custom character set.

Available for purchase only at $2,050 in quantity one. OEM discounts are available.

CHARACTERISTICS

VENDOR: Digital Equipment Corporation (DEC), 146 Main Street, Maynard, MA 01754.

DATE OF ANNOUNCEMENT: June 1978.

DATE OF FIRST DELIVERY: September 1978, volume delivery November 1978.

NUMBER DELIVERED TO DATE: Information not available.

SERVICED BY: Digital Equipment Corporation.

CONFIGURATION

The standard VT-100 is a CRT with detached keyboard which displays upper and lower case ASCII characters in a format of 24 lines of 80 characters or 24 lines of 132 characters. An optional printer port is available, only for terminals equipped with the advanced video option.

TRANSMISSION SPECIFICATIONS

The VT-100 transmits in full duplex mode, asynchronously. Transmission speeds are switch selectable at 50, 75, 110, 134.5, 150, 200, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 9600 or 19.2K bps. A total of 94 ASCII characters may be transmitted. Odd, even, or no parity is also switch selectable from the operator keyboard. A standard EIA RS-232-C interface is the standard connection. A 20 mA current loop interface is available as an option.

DEVICE CONTROL

Transmission is performed on a character-by-character basis as each key is depressed by the operator.

A split screen capability permits prompts and status indications to be displayed independent of keyed data. Smooth scrolling in either direction is also standard. The split screen also permits only part of the screen to scroll. Thus menu selection or prompts may be scrolled without disturbing keyed data.

The basic character set includes a number of line drawing graphics which may be used to form pictorial information

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Digital Equipment Corporation
VT-100 Video Display Terminal

	Excellent	Good	Fair	Poor	WA*
Overall performance	7	3	0	0	3.7
Ease of operation	7	2	1	0	3.6
Display clarity	7	3	0	0	3.7
Keyboard feel & usability	7	3	0	0	3.7
Hardware reliability	7	3	0	0	3.7
Maintenance service	4	4	2	0	3.2
Technical support	4	3	2	1	3.0

*Weighted Average on a scale of 4.0 for Excellent.

Datapro conducted telephone interviews with three of the respondents to obtain additional comments. The first user interviewed was a west coast manufacturer, who praised the reliability of the terminal. The company had required no service on the unit in the 1½ years that it had been operating. The user added that the VT-100's smooth scroll feature was "... a nice thing to have." The terminal's VT-52 emulation is often utilized, stated the user, but the 132-column capability had never been needed for their applications. The only negative point mentioned was an imperfection in the keyboard, which the operator was capable of correcting himself.

The second respondent questioned was a southwest utility company. Although in limited use, the user praised his VT-100 for its versatility, reliability, and the excellent quality of the characters generated. "It's a little expensive for our application," he added, "but the readily available service from DEC makes it worth it".

The final user polled was an east coast software development house. This user felt that the VT-100's main attribute was its human engineering. He praised the clear characters, smooth scrolling, keyboard layout and feel, and the detachability of the keyboard. He stated that although the 132-column format was hard to read and contained a design problem (the text is pressed too close to the left margin), "All in all, we are very pleased.□

on the display screen. Simple forms, graphs and charts may be created when required using these graphic characters.

The VT-100 provides composite video input and output. Composite video input permits the user to overlay video output from a remote terminal or processor without interfering with local usage. Composite video output permits the VT-100 to drive an auxiliary monitor which is useful where data or text must be displayed to a group of people.

The VT-100 is compatible with the DEC VT-52.

Advanced Video Option provides dual intensity, blink and underline functions in any combination with each other and with reverse video. This option also adds 10 additional 132-character display lines for a total of 24 lines. The Advanced Video Option also provides additional circuitry to add an alternate or custom character set in the future. Thus two character sets would reside in the terminal.

CRT DISPLAY UNIT: The standard VT-100 terminal displays 24 lines of 80 characters, or 24 lines of 132 characters. Characters are upper/lower case, formed on a 7 x 9 matrix; however, double size of double width characters may be displayed on a line-by-line basis. Lower case characters have two-dot descenders for those characters which extend below the base line. The user may select white characters on a black screen or black characters on a white screen on a character-by-character basis. A 128-character ASCII set is displayed. The display monitor measures 14.5 inches high, 18 inches wide, and 8 inches deep.

KEYBOARD: The detached keyboard is connected to the display terminal via a six-foot coil cord permitting virtually any convenient keyboard placement. The keyboard is sculptured and arranged in conventional typewriter configuration. In addition, there is an 18-key numeric/function keypad which provides calculator-style numeric input plus single keystroke entries for program controlled application functions. There are a total of 83 keys.

PRICING

The VT-100 is available for purchase only at $2,050 per unit. The Advanced Video Option is priced at $290 per unit. Monthly maintenance is available from DEC at $17.00 per unit.■

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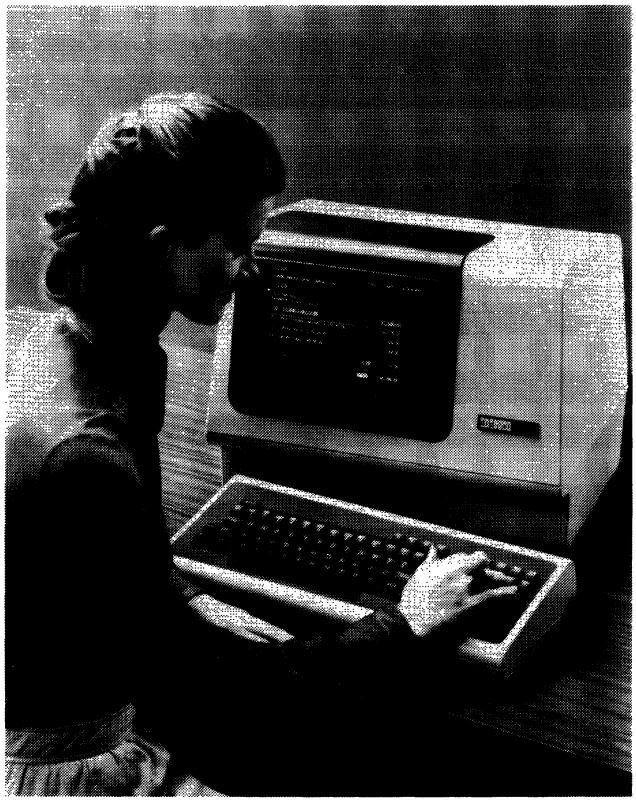
Digital Equipment Corporation VT-100 Video Display Terminal



A stand-alone teletype compatible display terminal capable of displaying either 80 or 132 characters per line. Standard features include detached keyboard, reverse video, split screen addressable cursor, selectable transmission rates, and parity.

An optional advanced video function provides full 24-line x 132-character screen capacity; blink, underline and dual intensity in any combination; and provision for storing an alternate or custom character set.

Available for purchase only at $1,900 in quantity one. OEM discounts are available.

MANAGEMENT SUMMARY

The VT-100 is an advanced function CRT display designed to supersede the DEC VT 52 while remaining compatible with it. In terms of the DEC product line, the VT-100 is a terminal for sale to OEM accounts; it is a display terminal which can be sold on DEC systems; and it forms the base of the PDT-11 terminal line, a user programmable family of terminals compatible with the PDP-11 series of computers.

The standard VT-100 can display 24 lines of 80 characters or 14 lines of 132 characters. An optional advanced video function provides an additional 10 lines of 132 characters. Characters are formed in a 7 x 9 matrix with upper/lower case displayed either as white on black or black on white.

The VT-100 has two mechanical switches, one for controlling the power supply and the other for turning the terminal on and off. All functions, (setting tab stops, transmission rates, parity, etc.) are set via the operator's keyboard. The keyboard is detached and connected to the display by means of a six-foot coil cord.□

CHARACTERISTICS

VENDOR: Digital Equipment Corporation (DEC) 146 Main Street, Maynard, MA 01754.

DATE OF ANNOUNCEMENT: June 1978.

DATE OF FIRST DELIVERY: September 1978, volume delivery November 1978.

NUMBER DELIVERED TO DATE: Information not available.

SERVICED BY: Digital Equipment Corporation.

CONFIGURATION

The standard VT-100 is a CRT with detached keyboard which displays upper and lower case ASCII characters in a format of 24 lines of 80 characters or 14 lines of 132 characters.

TRANSMISSION SPECIFICATIONS

The VT-100 transmits in full duplex mode, asynchronously. Transmission speeds are switch selectable at 50, 75, 110, 134.5, 150, 200, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 9600 or 19.2K bps. A total of 94 ASCII characters may be transmitted. Odd, even, or no parity is also switch selectable from the operator keyboard. A standard EIA RS-232 interface is the standard connection. A 20 mA current loop interface is available as an option.

DEVICE CONTROL

Transmission is performed on a character-by-character basis as each key is depressed by the operator. The standard VT-100 terminal displays 24 lines of 80 characters, or 14 lines of 132 characters. Characters are upper/lower case, formed on a 7 x 9 matrix; however, double size or double width characters may be displayed on a line-by-line basis. Lower case characters have two-dot descenders for those characters which extend below the base line. The user may select white characters on a black screen or black characters on a white screen on a character-by-character basis.

A split screen capability permits prompts and status indications to be displayed independent of keyed data. Smooth scrolling in either direction is also standard. The split screen also permits only part of the screen to scroll. Thus menu selection or prompts may be scrolled without disturbing keyed data.

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Digital Equipment Corporation
VT-100 Video Display Terminal

The basic character set includes a number of line drawing graphics which may be used to form pictorial information on the display screen. Simple forms, graphs and charts may be created when required using these graphic characters.

The VT-100 provides composite video input and output. Composite video input permits the user to overlay video output from a remote terminal or processor without interfering with local usage. Composite video output permits the VT-100 to drive an auxiliary monitor which is useful where data or text must be displayed to a group of people.

The VT-100 is compatible with the DEC VT-52.

Advanced Video Option provides dual intensity, blink and underline functions in any combination with each other and with reverse video. This option also adds 10 additional 132-character display lines for a total of 24 lines. The Advanced Video Option also provides additional circuitry to add an alternate or custom character set in the future. Thus two character sets would reside in the terminal, switch selectable by the operator.

The detached keyboard is connected to the display terminal via a six-foot coil cord permitting virtually any convenient keyboard placement. The keyboard is sculptured and arranged in conventional typewriter configuration. In addition, there is an 18-key numeric/function keypad which provides calculator-style numeric input plus single keystroke entries for program controlled application functions. There are a total of 83 keys.

PHYSICAL CHARACTERISTICS

The VT-100 display monitor measures 14.5 inches high, 18 inches wide and 14.25 inches deep. The keyboard measures 3.4 inches high, 18 inches wide and 8 inches deep. Because the base of the monitor is recessed, the total depth of the terminal is 20.25 inches if the keyboard is placed directly in front of, and flush with the monitor. The weight of the terminal is 34.5 pounds.

PRICING

The VT-100 is available for purchase only at $1,900 per unit. The Advanced Video Option is priced at $270 per unit. Monthly maintenance is available from DEC at $17.00 per unit.■

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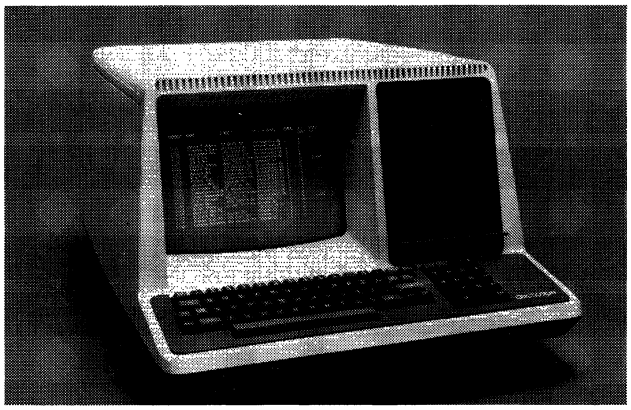
Digital Equipment Corporation DECscope VT50 and VT52



The VT52 has the same physical appearance as the VT50, but features an auxiliary keypad (standard), a 1920-character screen, and several other significant features not found on the earlier VT50.

A low-cost family of teletype-compatible CRT keyboard/display terminals.

Standard features include selectable transmission rates, tabulation, extensive cursor control, addressable cursor, program function keys, numeric pad, etc. Options include an RS-232C or current loop interface and a serial/parallel printer interface.

Configurations are stand-alone. Pricing ranges from $1,300 to $2,320 including all options. The VT50 and VT52 are available for purchase only. OEM and end-user quantity discounts are available.

MANAGEMENT SUMMARY

Known as the IBM of the minicomputer industry, Digital Equipment Corporation is also a manufacturer of terminals that complement its minicomputers and provide total systems capability. Its terminals have also achieved prominence within the industry and are integrated into systems offered by several vendors. These prominent DEC terminals include the DECwriter, a teleprinter terminal (Report C27-384-101), and the DECscope, a display terminal. The DECscope is available in two models, the VT50 and a newer, more sophisticated version, the VT52. Both models are identical in appearance and include a 12-inch CRT screen and an integral keyboard. The terminals are teleprinter-oriented and provide Teletype compatibility.

As alternatives to teleprinter terminals, the DECscopes offer several useful features that provide increased operating flexibility, communications efficiency, and performance. Paramount among these features is the Hold Screen mode, which lets the user view displayed data at his own pace by freezing the page; when ready, the user requests additional data. Under user control, the terminal automatically regulates the volume of data transmitted by the host computer via commands that interrupt or request the transmitted data. This useful feature is complemented by the Alternate mode feature provided by the VT52. This feature allows the auxiliary keypad to be used for user (software)-defined program function keys as an alternative to their basic functions.

Display clarity is improved on the VT52 over the VT50, which has lower character resolution. And unlike the VT50, the VT52 displays both upper and lower case symbols in addition to 33 graphic symbols.

Neither model provides edit functions, such as character and line insert and delete, or format protection for struc- ▷

CHARACTERISTICS

VENDOR: Digital Equipment Corporation (DEC), One Iron Way, Marlborough, MA 01782. Telephone (800) 225-9480.

DATE OF ANNOUNCEMENT: VT50—June 1974; VT52—September 1975.

DATE OF FIRST DELIVERY: VT50—December 1974; VT52—December 1975.

NUMBER DELIVERED TO DATE: About 80,000.

SERVICED BY: Digital Equipment Corporation.

MODELS

Model VT50 and VT52 DECscope Video Display Terminals are stand-alone, Teletype-compatible alphanumeric display terminals with integral keyboards. The VT52 can accommodate a printer via the optional Printer Interface Module. The option provides a serial (RS-232C) and parallel interface and can accommodate the DECwriter or the DEC LA180 printer.

TRANSMISSION SPECIFICATIONS

Transmission is asynchronous and is performed in the half or full duplex mode at switch-selectable data rates of 75, 110, 150, 300, 600, 1200, 2400, 4800, and 9600 bits/second. The 10- or 11-unit, 8-level ASCII code is used. Parity is switch-selectable. Even parity or a mark condition ("1") are selectable; odd or a space condition ("0") are selectable if specified. Each character includes one start bit and one or two (at 110 bps) stop bits. The VT50 provides a 20 ma dc current loop interface; an RS-232C interface is optional. The VT52 is available with a 20 ma dc current loop interface or an RS-232C interface.

DEVICE CONTROL

Transmission is performed on a character-by-character basis as each key is depressed. The terminal interprets 33 discrete remote commands and executes the appropriate function. Most of these commands are keyed or received escape sequences (the escape control code followed by an alphanumeric character). The commands that are executed by the ▷

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Digital Equipment Corporation
DECscope VT50 and VT52

tured data entry applications. These functions require buffered operation and block transmission, which the VT50 and VT52 do not provide. The DECscope models are designed to satisfy the teleprinter market, and as such are not required to include data entry functions, which would result in higher prices.

Only the VT52 is available with a printer interface, which may be a severe limitation for some potential users of the VT50. The optional printer interface for the VT52 accommodates a serial or parallel printer interface (the DECwriter or DEC LA180 can be used) and responds to local or remote commands that condition the printer to print only displayed data as a local copy printer or data received from the communications line that is not displayed. Printing can be performed by line or page (via command), which provides added flexibility.

The salient features of the VT50 and VT52 are as follows:

- 1920—(VT52) or 960—(VT50) character screen.
- 96 displayable symbols plus 32 additional graphic symbols (VT52 only).
- Individual cursor control keys (VT52 only).
- Addressable cursor (VT52 only).
- Tabulation.
- Character-by-character transmission.
- Switch-selectable transmission rates from 75 to 9600 bps.
- Asynchronous operation.
- RS-232C interface (optional on VT50).
- 20 ma dc current loop interface (standard on VT50).
- Printer interface (a VT52 option only).
- Auxiliary keypad including numeric keys (standard on VT52 only).

USER REACTION

In Datapro's 1976 survey of alphanumeric display terminal users, 4 users reported on their experience with a total of 19 DEC VT50 display terminals. Their ratings are presented below.

	Excellent	Good	Fair	Poor	WA*
Overall performance	3	0	1	0	3.5
Ease of operation	4	0	0	0	4.0
Display clarity	2	2	0	0	3.5
Keyboard feel and usability	3	1	0	0	3.8

VT50 and VT52 perform carriage return, line feed, space, backspace, tabulation, screen erase, line erase, sound audible alarm (bell), cursor movement, terminal identification, enable and disable Hold Screen mode, and enable Escape mode. The VT52 also executes commands for cursor addressing (line and character), additional cursor movement, and auxiliary keypad, Alternate mode, Graphic and Print mode enable/disable.

The Hold Screen mode freezes a page of displayed data until the Scroll function is keyed, which permits the next line or page of data (defined by one or more line feed codes) to be displayed. The terminal remains in the Hold Screen mode until disabled by the appropriate command (Escape sequence). An internal buffer (Silo) receives data to be displayed from the host computer when the terminal is in the Hold Screen mode. A line or page of data is transferred from Silo and displayed for each depression of the shift and/or scroll keys. When the Silo is full, an XOFF code is transmitted to the host computer to interrupt transmission. Transmission is continued when the terminal transmits an XON code, which indicates that the terminal can accept one or more lines of data depending on the quantity of data remaining in the Silo. The transmission of XON and XOFF control codes is an automatic function of the terminal and the Scroll function is active only in the Hold Screen mode.

When not in the Hold Screen mode, data automatically rolls up by one line when data is displayed on the last line and a line feed occurs; the first line is lost as it rolls off the screen.

Cursor movement results from carriage return, line feed, tab, space and backspace functions. Cursor movement is also directed by keyed or received Escape sequence commands and by individual cursor control keys on the VT52. Carriage return positions the cursor to the beginning of the line occupied by the cursor. Line feed moves the cursor to the same character position of the next line. The data scrolls up by one line if the last line contains data when a line feed is received; the first line is lost as it scrolls off the screen. Space and backspace move the cursor forward or backward by one character position. Tab moves the cursor to the next tab stop. Tab stops are spaced at 8-character intervals up to the 72nd character position. The tab function advances the cursor by one character position following the 72nd character position. Individual cursor controls on the VT52 move the cursor up, down, left, and right and transmit the appropriate control codes. Escape sequences move the cursor up, down (VT52 only) right, left (VT52 only), and home. Cursor functions do not feature wraparound; movement stops at the end of a line or at the top or bottom line.

Erasure functions are also directed by Escape functions and include screen and line erase. Screen erase erases all displayed data from the cursor position to the end of the display. Erase line erases all data displayed on the line occupied by the cursor beginning with the cursor location.

The auxiliary keypad on the VT52 operates in one of two modes; Numeric or Alternate. In Numeric mode, numeric codes (different from those generated by the main keygroup) are generated for each numeric key. In Alternate mode, each numeric key generates a unique escape sequence. The cursor and blank keys generate the same escape sequence in either mode. The escape sequences generated by the numeric keys in the Alternate mode can be defined by user programs. The Caps Lock function on the VT52 affects the main keygroup only, not the auxiliary keypad. When enabled, the Caps Lock function disables lower case; only upper case codes are transmitted.

The Printer mode, provided for the VT52 only via the optional Printer Interface Module, features local or remote control of an attached printer. Keyed or received control se-

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Digital Equipment Corporation
DECscope VT50 and VT52

	Excellent	Good	Fair	Poor	WA*
Hardware reliability	3	0	0	1	3.3
Maintenance service	2	1	1	0	3.3
Software & technical support	2	2	0	0	3.5

*Weighted Average on a scale of 4.0 for Excellent.

These satisfied users unanimously cited low cost as the key advantage of the VT50. Flexibility, reliability, and strong vendor support each received two mentions. Performance limitations were cited by two users as the basic disadvantage.□

quences execute a print screen or print cursor line operation or enable or disable Auto-Print or Printer-Controller modes. The Auto-Print mode prints the line occupied by the cursor and moves the cursor down by one line for each line feed. The Printer-Controller mode prints without displaying data received from the communications line.

COMPONENTS

CRT DISPLAY UNIT: A 12-inch (diagonal measurement) CRT with a viewing area 4.1 inches high by 8.3 inches wide. The display arrangement is as follows:

	VT50	VT52
Chars./display:	960	1920
Chars./line:	80	80
Lines/display:	12	24

The VT50 provides a character set of 64 ASCII characters including upper case alphabetics, numerics, and special symbols. The VT52 provides a character set of 96 ASCII characters including upper and lower case alphabetics, numerics, and specials plus 32 additional special symbols with the Graphics mode. Data is displayed in white. The VT50 displays each character within a 5-by-7 dot matrix. The VT52 displays each character within a 7-by-7 dot matrix. The cursor is displayed as a blinking underscore.

VT50 KEYBOARD: A 62-key, typewriter-style integral keyboard. Key functions include Back Space, Break, Line Feed, Delete, Carriage Return, Tab, Escape, Bell, Scroll, Shift, and Control Shift. The keyboard generates any of 64 ASCII upper case codes.

VT52 KEYBOARD: A 62-key, typewriter-style integral keyboard. Key functions include Back Space, Break, Line Feed, Delete, Carriage Return, Repeat, Escape, Tab, Bell, Scroll, Caps Lock, Shift, and Control Shift. The keyboard generates any of 128 ASCII characters. The 19-key auxiliary keypad located to the right of the main keygroup includes 11 numeric key (including decimal point), four cursor control keys, and the Enter key.

PRICING

DEC offers direct purchase of equipment through its catalog sales with discounts up to 9 percent off list price for cash with the order, and up to 5 percent for cash within 30 days for approved, open account customers. The DECscope can also be ordered through the Components Group, which provides discounts of up to 38 percent on orders of 50 or more units over a 12-month period. End-user and OEM Dollar and Unit Volume discount agreements are available for end-user and OEM orders that include the DECscope as part of complete minicomputer systems. Contact Digital Equipment Corp. for the discounts for these arrangements.

Installation is pried at $95 per terminal. The field installation charge for the Printer Interface Module is $50 per option plus a $45 site charge. The monthly maintenance charge is for prime-shift service.

	Purchase Price		
	1-49 Units	50-99 Units	100-199 Units
VT 50 with 20 ma dc current loop interface	$1,300	$ 995	$ 925
VT50 with RS-232C/CCITT interface	1,360	1,041	967
VT52 with 20 ma dc current loop interface	2,095	1,570	1,425
VT52 with RS-232C/CCITT interface	2,095	1,570	1,425
Printer Interface Module (VT52 only)	225	—	—■

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Digital Equipment Corporation VT200 Display Family

In this report:

Product Summary

Editor's Note
Digital Equipment Corporation no longer manufactures the VT200 display family. Its successor, the VT300 display series, offers full compatibility, improved ergonomics, and greater functionality at a lower price. Because of the high market penetration of the VT200 family, Datapro continues to include this product report in *Datapro Reports on Data Communications.*

Description
The VT200 family of video display terminals consists of three models. The VT220 is a monochrome terminal designed for text-oriented applications. The monochrome VT240 and the color VT241 both offer bit-mapped graphics capability.

Strengths
The VT200 display terminals provide improved price/performance over the VT100. Their monitors offer smaller footprints and more streamlined designs, and their low-profile keyboards are more comfortable. With the VT241, Digital introduced color capability.

Limitations
Because of the strong demand for the VT220, Digital raised its price to $1,395. Other vendors countered by introducing VT220 clones for less than $800, forcing Digital to lower its price accordingly. Today, VT220 imitations are still marketed for as little as $499.

Competition
Wyse Technology, Hewlett-Packard, TeleVideo Systems, Qume Corporation, Esprit Systems, and several others.

Vendor
Digital Equipment Corp. (DEC)
146 Main Street
Maynard, MA 01754-2571
(508) 493-5111

Prices
The VT200 family is no longer marketed.

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Analysis

Product Strategy

Digital Equipment Corporation's VT200 series, announced in November 1983, more than aptly succeeded its predecessor, the VT100 product line. Prior to its discontinuance, the VT100 was the most successful and most widely emulated ASCII terminal, with more than one million sold. Featuring full VT100 compatibility, the VT200 terminals offer a modular design based on the company's line of personal computer products, and provide the user with an improved price/performance ratio over that found on the VT100 terminals. With the demand for the VT220 being so strong, Digital, being confronted by independent terminal vendors offering clones for as little as $795, responded to the intense competition by reducing the price of this general-purpose model to match that of the clone versions offered by its competitors.

The VT200 family consists of three models: the VT220, VT240, and VT241. The VT220 is the low-end model, a general-purpose interactive display which directly replaces the venerable VT100. Features include a 12-inch monochrome display, 80-/132-column display capability, and a detachable keyboard. The VT240 combines the VT220's text functions with graphics capability; two graphics protocols are available (Digital's ReGIS and Tektronix' 4010/4014). The VT241 is a color text/graphics terminal, combining the features found on the VT220 and VT240 with color display capability and a slightly larger (13 inches) display screen.

The VT200 terminals incorporate a modular enclosure design not found on the older VT100 models. As a result of this design, the VT200 terminals are more compact and take up less desk space than the older VT100 models. The VT220 features two-piece construction, including the monitor and keyboard; terminal logic is contained in the monitor housing. The VT240 and VT241 feature three-piece construction, consisting of the monitor, the keyboard, and a system box containing the terminal's logic. The VT200 monitors have a wedge-shaped design with a built-in tilt feature; the keyboards incorporate a low-profile design and conform to the DIN standard for ergonomics.

Competitive Position

Digital's VT100 display terminal ranks as the most successful ASCII terminal ever marketed. Since its

The VT220 offers a 12-inch monochrome green, amber, or paper-white screen providing 80- or 132-column display capability. Its 103-key typewriter-style keyboard, which includes 15 programmable function keys and a numeric pad, is available in any of 16 international styles.

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introduction in 1978, 1 million VT100s have been shipped, including submodels VT101, VT102, VT125, VT131, and VT132.

Into this ready-made market came the VT200 family. Digital imbued the VT200 terminals with full VT100 compatibility, virtually assuring them of a successful product life. Demand for the VT220 in particular was initially strong, enabling Digital to raise the price of the terminal from $1,295 to $1,395.

After the VT200 introduction, however, a large number of terminal vendors introduced VT200 emulators, most of them emulating the VT220. These competitors included Wyse Technology, Hewlett-Packard, TeleVideo Systems, Qume Corporation, Esprit Systems, CIE Terminals, Zentec, Liberty Electronics, Microterm, Visual Technology, and many others. These vendors unveiled their VT220 clones with purchase prices as low as $795, which forced Digital to lower the price of the VT220 to match those of the independent manufacturers.

Years after their withdrawal, an emulation market for the VT200 and VT100 still flourishes. The VT100/200/300 emulation market is second in size only to the IBM 3270 emulation market in overall display terminal sales. Most major general-purpose ASCII display terminal vendors provide models with some VT emulation as part of their product lines.

When Digital introduced the VT100 in 1978, the company underestimated the demand for that terminal. Orders piled up until a three-to-five month wait for delivery was not uncommon. Into this gap came the independent vendors with their VT100 emulators, and a lucrative emulation market was born. Having apparently learned from this experience, Digital was prepared for the demand for VT200 terminals, and did not report serious shortages of the terminal despite the strong demand generated for the product. The independents, seeking an entry into this market, turned to price as a weapon. The result meant greater value for the consumer.

Decision Points

The VT200 terminals provide significant price/performance improvements over the VT100. These models incorporate an improved terminal housing design, provide full VT100 compatibility and functionality, and are priced lower than their predecessors. In addition, the VT240 and VT241 have graphics capabilities previously found only on the VT125. Color has also been added to the Digital terminal product line with the VT241.

Significant features carried over from the VT100 terminals include 80-/132-column display capability and conformance with the ANSI X3.64 standard for control codes. The American National Standards Institute (ANSI) first published the X3.64 standard for two-dimensional data devices in 1977. The goal was to standardize control codes for all terminals, effectively eliminating compatibility problems. The VT100 was the first display terminal to conform to the ANSI standard. In order to provide true Digital emulation, the makers of Digital emulators must also provide ANSI X3.64 code compatibility on their products.

Digital created a display terminal standard with the VT100. The company succeeded in advancing that standard with the success of the VT200 terminals.

Characteristics

Models: VT220, VT240, and VT241.

Date Announced: November 1983.

Date First Installed: November 1983.

Number of Units Sold: Over 1 million.

Models

The Digital VT200 display terminal family consists of three models:

- VT220—an interactive display for text-oriented applications. The VT220 is a two-piece modular unit consisting of a 12-inch monochrome display/control unit and a detachable keyboard. The display features 80-/132-column display capability and has amber, green, or white phosphor characters.

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Company Profile Digital Equipment Corporation

Corporate Headquarters
146 Main Street
Maynard, MA 01754-2571
(508) 493-5111

In Canada
Digital Equipment of Canada, Ltd.
P.O. Box 13000, 100 Herzberg Road
Kanata, ON K2K 2A6
(613) 592-5111

Officers
President: Kenneth H. Olsen
Senior Vice President, Engineering, Manufacturing, and Product Marketing: John F. Smith
President and CEO, European Operations: Pier Carlo Falotti

Company Background
Year Founded: 1957
No. Employees: 125,000
No. Systems Sold (cumulative): More than 500,000

Led by Kenneth H. Olsen, three engineers founded Digital Equipment Corporation in 1957. Using their own money in addition to funding from a Boston venture-capital firm, they set up operations in an old brick wool mill in Maynard, MA.

Digital's first product was a set of electronic modules for computer test equipment. Three years after its founding, Digital introduced its first computer, the Programmed Data Processor Model 1, or PDP-1. In 1963, the company introduced its landmark PDP-8, the first successful minicomputer.

The PDP-8 established a whole new market for smaller computers and made Digital a rising star within an industry then dominated by mainframe vendors. Digital's smaller machines soon became a price/performance alternative to big mainframes and also introduced the concept of distributed processing.

In 1977, Digital introduced the VAX (virtual address extension) Series of 32-bit minicomputers, one of the most successful product launches in computer industry history. Since introducing the first VAX, the 11-780, Digital has continued to enhance the basic VAX architecture and VAX/VMS operating system with announcements of new and more powerful VAX models over the years.

The current VAX family consists of VAXstation desktop workstations; MicroVAX departmental systems; VAX 6000 Series medium-range systems; and VAX 9000 Series high-end mainframes.

In addition to the VAX family, Digital offers DECsystems which use reduced instruction set computing (RISC) technology and operate under ULTRIX, Digital's implementation of the UNIX operating system.

To support its systems, Digital offers disk, storage array, and solidstate memory products; optical disks; tape devices; and printers. Besides hardware and software, Digital offers a range of communications and networking products and services.

Business Overview
Digital likes to characterize itself as the world's

- VT240—an interactive display with both text and graphics capabilities. The VT240 is a three-piece modular unit consisting of a 12-inch monochrome display unit, a detachable keyboard, and a system box. The display features 80-/132-column display capability and has amber, green, or white phosphor characters. Screen resolution is 800 by 240 pixels. Two graphics instruction sets have bit-mapped graphics capability.
- VT241—an interactive, graphics-oriented terminal with color. The VT241 is a three-piece modular unit consisting of a 13-inch color display unit, a detachable keyboard, and a system box. The display features 80-/132-column display capability, and has a resolution of 800 by 240 pixels. Two graphics instruction sets have bit-mapped graphics capability.

All models conform to the ANSI X3.64 standard.

Transmission Specifications

Transmission is asynchronous in full-duplex mode at transmission rates from 50 to 19.2K bps. The 7- or 8-bit ASCII code is used. Odd, even, mark, or no parity is selectable from the keyboard. Local echo is standard. An

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leading supplier of networked computer systems as well as a leader in systems integration. To remain a leader, particularly in these specific areas, the company believes it must support openness and industry standards to remain competitive in the 1990s. The company is a key participant in industry standards organizations such as the Open Systems Foundation (OSF), an industry group founded in 1988 to develop industry-recognized specifications for UNIX. UNIX will be the standard operating system for users who prefer open systems rather than proprietary systems.

Network Application Support (NAS), a new Digital strategic direction addressing VAX compatibility and multivendor connectivity, will let users integrate desktop systems and large system resources involving both Digital and non-Digital systems.

In 1988, Digital introduced Enterprise Management Architecture (EMA), an integrated network management strategy.

Financial Profile

Digital Equipment continues to rank as the second largest U.S. computer company as measured by total revenues. While Digital enjoyed record revenue and profit growth through the 1980s—largely on the strength of its VAX platform and networking architecture—sales and profits have been sluggish within the last couple years.

For fiscal 1989, ended June 30, Digital reported net earnings of $1.1 billion, down 18 percent from the $1.3 billion earned in 1988. Revenues for 1989 were $12.7 billion, up 11 percent from the $11.5 of the previous year.

Earnings for the second fiscal quarter, ended December 30, 1989, were $155.4 million compared with $279 million for the same period last year, a 44 percent drop. (See graph for revenue and earning trends over the last several years.)

Digital blamed the profit drop on flat U.S. sales and lower demand for high-margin products. Like major competitors, Digital continues to do better internationally.

In moves designed to reduce expenses, last summer Digital announced that it would begin shifting 4,000 manufacturing employees to other jobs and offered severance packages to 700 manufacturing and administrative employees.

Management Statement

Digital is making a $1.5 billion investment toward new product development. According to the president's letter, Digital is "continuing to invest heavily in VAX and RISC-based systems and VMS and UNIX software." Within the next year, "Digital's strategy is to focus on the computing environment of the 1990s. Digital will offer the widest selection of technology and continue to make significant investments in R&D and new products in response to dynamically changing customer needs."

EIA RS-232-C or 20 mA interface is included; also standard is an RS-232-C serial printer port. An integral modem with auto dial and auto answer capabilities is optional on the VT241.

Device Control

All VT200 models provide full VT100 compatibility. VT200 terminals can emulate the operation of the VT100, enabling the user to use the terminals with existing application programs that support VT100 terminals.

For all VT200 models, transmission is performed on a character-by-character basis as each key is depressed. The selection and storage of local terminal parameters is performed in Set-Up mode. The VT200 terminals provide a plain-language setup menu, which is cursor driven. The set of menus presents plain-language choices in any of three selectable languages: English, German, or French.

Visual attributes include reverse video and character highlighting. The Selective Erase feature allows the user to select positions on the screen to be erased without erasing the whole screen. Programmable function keys allow the user to store commonly used commands and execute them with a single keystroke. Also featured is a downline loadable character set, allowing as many as 94 characters to be loaded into the terminal from the host, thus enabling users to design special characters for use in specific applications.

Both the VT240 and VT241 support two high-level graphics instruction sets: Digital's ReGIS (Remote Graphics Instruction Set) and Tektronix' 4010/4014 graphics protocols. Digital also provides applications software, such as DECgraph and DECslide, to support the graphics features of the VT240 and VT241. The

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VT241 features RGB (red/green/blue) output to devices such as a color camera and an auxiliary color monitor. Color graphics print output is also available. All VT200 models feature composite video output, allowing the user to connect auxiliary monitors to the VT200 terminals.

Components

CRT Display Unit

A 12-inch (diagonally measured), monochrome, nonglare display is standard on the VT220 and VT240. The VT241 includes a 13-inch color display. Terminal control logic is located in the display monitor of the VT220; the VT240 and VT241 include a separate system box which houses terminal logic. Amber, green, or white phosphor characters can be selected for the VT220 and VT240. Four colors out of a palette of sixty-four can be displayed on the VT241. A multinational character set (MCS) that includes the full ASCII set is displayable; any of 256 multinational characters can be generated from the keyboard. Also available is the national replacement character set (NRC), which allows users to generate international characters and is backward compatible with the VT100. A CRT Saver feature, designed to prolong the life of the CRT, is standard on all models.

All models feature selectable display formats of 24 lines of 80 characters, and 24 lines of 132 characters. Character brightness and screen contrast are individually adjustable. The VT200 monitors have a built-in tilt feature for ease of viewing.

Keyboard

All models feature a low-profile, detachable keyboard that conforms to the international DIN standard for human engineering. A total of 103 keys are contained on the keyboard, which features a typewriter-style layout, separate numeric pad, and 15 programmable function keys. Function keys can be custom labeled for user-defined applications. All keys feature a sculptured, matte finish and provide an audible key click.

A total of 16 different language keyboards are available for the VT200 terminals; 8 are available in specialized word processing configurations. The standard character set generated is multinational.

Pricing

The VT200 family terminals are no longer actively marketed. Digital still offers service and support, however. ■

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Digital Equipment Corporation VT200 Video Display Terminal Family

datapro ANALYSIS

UPDATE: *Digital Equipment Corporation no longer manufactures the VT200 Video Display Terminal Family. The VT300 family is replacing that series. Digital still offers service and support for the VT200 family, however. According to Digital, the VT300 family offers full-backward compatibility, improved ergonomics, and more functionality at a lower price. Datapro will continue to include the VT200 family report, however, due to the high market penetration of this series.*

Digital Equipment Corporation's VT200 Series, announced in November 1983, more than aptly succeeded its predecessor, the VT100 product line. Prior to its discontinuance, the VT100 was the most successful and most widely emulated ASCII terminal, with more than one million sold. Featuring full VT100 compatibility, the VT200 terminals offer a modular design based on the company's line of personal computer products, and provide the user with an improved price/performance ratio over that found on the VT100 terminals. With the demand for the VT220 being so strong, Digital, being confronted by independent terminal vendors offering clones for as little as $795, responded to the intense competition

VENDOR: Digital Equipment Corp. (DEC), 146 Main Street, Maynard, Massachusetts 01754-2571. Telephone (508) 897-5111.
MODELS: VT220, VT240, and VT241.
COMPETITION: CIE Terminals, Zentec, Liberty Electronics, Micro-Term, TeleVideo Systems, Visual Technology, Wyse Technology, and several others.
PRICE: The VT200 family is no longer actively marketed.

REPORT HIGHLIGHTS: **PAGE**

The Digital VT200 family of video display terminals consists of three models. The VT220 features full VT100 compatibility, the VT240 provides bit-mapped graphics architecture and text/graphics capabilities, and the VT241 replaces the monochrome display of the VT240 with a color monitor.

REFERENCE EDITION: This is a mature product. No significant further developments are anticipated, but because of its importance in the history of the industry, coverage is being continued. No future updates are planned.

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Digital Equipment Corporation
VT200 Video Display Terminal Family

by reducing the price of this general-purpose model to match that of the clone versions offered by its competitors.

The VT200 family consists of three models: the VT220, VT240, and VT241. The VT220 is the low-end model, a general-purpose interactive display which directly replaces the venerable VT100. Features include a 12-inch monochrome display, 80-/132-column display capability, and a detachable keyboard. The VT240 combines the VT220's text functions with a graphics capability; two graphics protocols are available (Digital's ReGIS and Tektronix' 4010/4014). The VT241 is a color text/graphics terminal, combining the features found on the VT220 and VT240 with color display capability and a slightly larger (13-inch) display screen.

The VT200 terminals incorporate a modular enclosure design not found on the older VT100 models. As a result of this design, the VT200 terminals are more compact and take up less desk space than the older VT100 models. The VT220 features two-piece construction, including the monitor and keyboard; terminal logic is contained in the monitor housing. The VT240 and VT241 feature three-piece construction, consisting of the monitor, the keyboard, and a system box containing the terminal's logic. The VT200 monitors have a wedge-shaped design with a built-in tilt feature; the keyboards incorporate a low-profile design and conform to the DIN standard for ergonomics.

PRODUCT EVALUATION

The VT200 terminals provide significant price/performance improvements over the VT100. These models incorporate an improved terminal housing design, provide full VT100 compatibility and functionality, and are priced lower than their predecessors. In addition, the VT240 and VT241 have graphics capabilities previously found only on the VT125. Color has also been added to the Digital terminal product line with the VT241.

Significant features carried over from the VT100 terminals include 80-/132-column display capability and conformance with the ANSI X3.64 standard for control codes. The American National Standards Institute (ANSI) first published the X3.64 standard for two-dimensional data devices in 1977. The goal was to standardize control codes for all terminals, effectively eliminating compatibility problems. The VT100 was the first display terminal to conform to the ANSI standard. In order to provide true Digital emulation, the makers of Digital emulators must also provide ANSI X3.64 code compatibility on their products.

Digital created a display terminal standard with the VT100. The company succeeded in advancing that standard with the success of the VT200 terminals.

MARKET POSITION

Digital's VT100 display terminal ranks as the most successful ASCII terminal ever marketed. Since its introduction in 1978, one million VT100s have been shipped, including submodels VT101, VT102, VT125, VT131, and VT132. An emulation market for the VT100 now flourishes, second in size only to the IBM 3270 emulation market in the display terminal industry. Most major general-purpose ASCII terminal vendors provide models with some VT100 emulation as part of their product lines.

Into this ready-made market came the VT200 family. Digital imbued the VT200 terminals with full VT100 compatibility, virtually assuring them of a successful product life. Demand for the VT220 in particular was initially strong, enabling Digital to raise the price of the terminal from $1,295 to $1,395. After the VT200 introduction, however, a large number of terminal vendors introduced VT200 emulators, most of them emulating the VT220. These competitors included CIE Terminals, Qume, Zentec, Liberty Electronics, Micro-Term, Tele-Video Systems, Wyse Technology, Visual Technology, and many others. These vendors unveiled their VT220 clones with purchase prices as low as $795, which caused Digital to lower the price of the VT220 to match those of the independent manufacturers.

When Digital introduced the VT100 in 1978, the company underestimated the demand for that terminal. Orders piled up until a three-to-five month wait for delivery was not uncommon. Into this gap came the independent vendors with their VT100 emulators, and a lucrative emulation market was born. Having apparently learned from this experience, Digital was prepared for the demand for VT200 terminals, and did not report the serious shortages of the terminal despite the strong demand generated for the product. The independents, seeking an entry into this market, turned to price as a weapon. The result meant savings for the consumer.

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Digital Equipment Corporation VT200 Video Display Terminal Family

however, a large number of terminal vendors have introduced VT200 emulators, most of them emulating the VT220. These competitors include CIE Terminals, ITT Qume, Lear Siegler, Liberty Electronics, Micro-Term, TeleVideo Systems, Wyse Technology, Visual Technology, and many others. These vendors have unveiled their VT220 clones with purchase prices as low as $795. This has caused Digital to lower the price of the VT220 to $1,095.

When Digital introduced the VT100 in 1978, the company underestimated the demand for that terminal. Orders piled up until a three-to-five month wait for delivery was not uncommon. Into this gap came the independent vendors with their VT100 emulators, and a lucrative emulation market was born. Digital is much more prepared for the demand for VT200 terminals, and serious shortages of the terminal have not been reported, despite the strong demand generated for the product. The independents, seeking an entry into this market, have turned to price as a weapon. The result: a fully compatible VT220 emulator for well below $1,000.

At the time of the VT200 announcement, Digital also announced that it would continue the production of the VT100 for at least two additional years. That time is up, and Digital has recently slashed prices and ceased production of the older models, signalling the end of the line for the VT100 family.

ADVANTAGES AND RESTRICTIONS

The VT100 achieved its success despite a relatively high price tag. The terminal's enhanced features (most notably its full-screen 132-column display capability) and high degree of functionality were key factors in the VT100's early success; later, as prices for display terminals plunged, the VT100 persevered chiefly because it had become a standard in the industry.

The VT200 terminals provide significant price/performance improvements over the VT100. The new models incorporate a new terminal housing design, provide full VT100 compatibility and functionality, and are priced lower than their predecessors. In addition, the VT240 and VT241 have graphics capabilities previously found only on the VT125. Color has also been added to the Digital terminal product line with the VT241.

Significant features carried over from the VT100 terminals include 80-/132-column display capability, and conformance with the ANSI X3.64 standard for control codes. The American National Standards Institute (ANSI) first published the X3.64 standard for two-dimensional data devices in 1977. The goal was to standardize control codes for all terminals, effectively eliminating compatibility problems. The VT100 was the first display terminal to conform to the ANSI standard. In order to provide true Digital emulation, the makers of Digital emulators must also provide ANSI X3.64 code compatibility on their products.

Both the VT240 and VT241 support two high-level graphics instruction sets: Digital's ReGIS (Remote Graphics Instruction Set) and Tektronix' 4010/4014 graphics protocols. Digital also provides applications software, such as DECgraph and DECslide, to support the graphics features of the VT240 and VT241. The VT241 features color RGB (red/green/blue) output to devices such as a color camera and an auxiliary color monitor. Color graphics print output is also available. All VT200 models feature composite video output, allowing the user to connect auxiliary monitors to the VT200 terminals.

COMPONENTS

CRT DISPLAY UNIT: A 12-inch (diagonally measured) monochrome nonglare display is standard on the VT220 and VT240. The VT241 includes a 13-inch color display. Terminal control logic is located in the display monitor of the VT220; the VT240 and VT241 include a separate system box which houses terminal logic. Amber, green, or white phosphor characters may be selected for the VT220 and VT240. Four colors (out of a palette of 64) may be displayed on the VT241. A multinational character set (MCS) that includes the full ASCII set is displayable; any of 256 multinational characters can be generated from the keyboard. Also available is the national replacement character set (NRC), which allows users to generate international characters, and is backward-compatible with the VT100. A CRT Saver feature, designed to prolong the life of the CRT, is standard on all models.

All models feature selectable display formats of 24 lines by 80 characters, and 24 lines of 132 characters. Character brightness and screen contrast are individually adjustable. The VT200 monitors have a built-in tilt feature for ease of viewing.

KEYBOARD: All models feature a low-profile, detachable keyboard that conforms to the international DIN standard for human engineering. A total of 103 keys are contained on the keyboard, that features a typewriter-style layout, separate numeric pad, and 15 programmable function keys. Function keys may be custom-labeled for user-defined applications. All keys feature a sculptured, matte finish and provide an audible key click.

A total of 16 different language keyboards are available for the VT200 terminals; 8 are available in specialilzed word processing configurations. The standard character set generated is multinational.

PRICING

The VT200 family terminals are available for purchase only. Digital Equipment Corporation supports the terminals through its Field Service, available worldwide in over 400 service locations and sales offices. Carry-in service is also available.

EQUIPMENT PRICES

	Purchase Price ($)	Monthly Maint. ($)
VT220	1,095	6
VT240	2,195	16
VT241	3,195	23 ■

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Digital Equipment Corporation VT200 Video Display Terminal Family

Digital created a display terminal standard with the VT100. The company's ad campaign for the VT200 boasts that they are now "Advancing the Standard." With the success that the new VT200 terminals have already enjoyed, it would appear that Digital has indeed succeeded in doing so.

USER REACTION

In Datapro's 1985 Terminal Users Survey, conducted in conjunction with *Data Communications* magazine, a total of 57 users responded with ratings for the VT200 family terminals. These users represented a total installed base of 2,592 units. A total of 46 of these users reported on their experiences with the VT220, totalling 2,259 installed terminals; the remaining 11 users reported on the VT240, covering 333 units. The users were asked to rate their terminals with regard to seven separate categories. The ratings given to the VT200 family terminals by these users are summarized in the following tables:

VT220	Excellent	Good	Fair	Poor	WA*
Overall performance	33	13	0	0	3.7
Ease of operation	31	12	3	0	3.6
Display clarity	28	17	1	0	3.6
Keyboard feel & usability	22	17	5	2	3.3
Ergonomics	19	20	4	2	3.2
Hardware reliability	24	16	3	0	3.5

VT220	Excellent	Good	Fair	Poor	WA*
Mfr.'s maintenance service/technical support	21	16	6	1	3.3

*Weighted Average on a scale of 4.0 for Excellent.

VT240	Excellent	Good	Fair	Poor	WA*
Overall performance	8	3	0	0	3.7
Ease of operation	8	3	0	0	3.7
Display clarity	8	3	0	0	3.7
Keyboard feel & usability	7	2	1	0	3.6
Ergonomics	9	2	0	0	3.8
Hardware reliability	6	3	1	0	3.5
Mfr.'s maintenance service/technical support	5	2	1	0	3.5

*Weighted Average on a scale of 4.0 for Excellent.

When asked whether or not they would recommend the VT200 terminals to other users, 49 of the respondents answered that they would; none of the users answered negatively. The remainder were undecided, or chose not to answer the question. □

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Digital Equipment Corporation VT200 Video Display Terminal Family

MANAGEMENT SUMMARY

UPDATE: *Digital Equipment Corporation's VT200 Video Display Terminal family has had one significant change since our last revision. The list price of its most popular member, the VT220, has been lowered by 27 percent. This $300 reduction brings the cost of this model down from $1,095 to $795.*

Digital Equipment Corporation's VT200 Series, announced in November 1983, has more than aptly succeeded its predecessor, the VT100 product line. Prior to its recent discontinuance, the VT100 was the most sucessful and most widely emulated ASCII terminal, with more than one million sold. Featuring full VT100 compatibility, the VT200 terminals offer a modular design based on the company's line of personal computer products, and provide the user with an improved price/performance ratio over that found on the VT100 terminals. With the demand for the VT220 being so strong, and being confronted by independent terminal vendors offering clones for as little as $795, Digital has responded to the intense competition by reducing the price of this general-purpose model to match that of the clone versions offered by its competitors.

The VT200 family consists of three models: the VT220, VT240, and VT241. The VT220 is the low-end model, a general-purpose interactive display which directly replaces the venerable VT100. Features include a 12-inch monochrome display, 80-/132-column display capability, and a detachable keyboard. The VT240 combines the VT220's text functions with a graphics capability; two graphics

Digital Equipment Corporation's VT200 family of display terminals is following in the sucessful footsteps of the discontinued VT100 family. These popular products provide full VT100 compatibility and functionality and considerably lower price tags. Color graphics, available on the VT241, is a capability not found on the VT100 terminals.

MODELS: VT220, VT240, and VT241.
DISPLAY: The VT220 and VT240 feature a 12-inch monochrome display; amber, green, or white phosphor characters are available. The VT241 is equipped with a 13-inch color display. All models feature 80-/132-column display capability.
KEYBOARD: All models include a 103-key detachable keyboard. The keyboard features a low-profile design and includes 15 programmable function keys. Sixteen different language keyboards are available.
COMPETITION: CIE Terminals, Zentec, Liberty Electronics, Micro-Term, TeleVideo Systems, Visual Technology, Wyse Technology, and several others.
PRICE: Purchase prices for the VT200 terminals range from $795 to $3,195.

CHARACTERISTICS

VENDOR: Digital Equipment Corporation, 146 Main Street, Maynard, Massachusetts 01754-2571. Telephone (617) 897-5111.

The Digital VT200 family of video display terminals consists of three models. The VT220 features full VT100 compatibility, the VT240 provides bit-mapped graphics architecture and text/graphics capabilities, and the VT241 replaces the monochrome display of the VT240 with a color monitor.

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Digital Equipment Corporation
VT200 Video Display Terminal Family

protocols are available (Digital's ReGIS and Tektronix' 4010/4014). The VT241 is a color text/graphics terminal, combining the features found on the VT220 and VT240 with color display capability and a slightly larger (13-inch) display screen.

The VT200 terminals incorporate a modular enclosure design not found on the older VT100 models. As a result of this design, the VT200 terminals are more compact, and take up less desk space, than the older VT100 models. The VT220 features two-piece construction, including the monitor and keyboard; terminal logic is contained in the monitor housing. The VT240 and VT241 feature three-piece construction, consisting of the monitor, the keyboard, and a system box containing the terminal's logic. The VT200 monitors have a wedge-shaped design with a built-in tilt feature; the keyboards incorporate a low-profile design and conform to the DIN standard for ergonomics.

COMPETITIVE POSITION

Digital's VT100 display terminal ranks as the most successful ASCII terminal ever marketed. Since its introduction in 1978, one million VT100s have been shipped, including submodels (VT101, VT102, VT125, VT131, and VT132). An emulation market for the VT100 now flourishes, second in size only to the IBM 3270 emulation market in the display terminal industry. Most major general-purposed ASCII terminal vendors provide models with some VT100 emulation as part of their product line.

Into this ready-made market comes the VT200 family. Digital imbued the VT200 terminals with full VT100 compatibility, virtually assuring them of a successful product life. Demand for the VT220 in particular has been strong, initially enabling Digital to raise the price of the terminal from $1,295 to $1,395. Since the VT200 introduction, however, a large number of terminal vendors have introduced VT200 emulators, most of them emulating the VT220. These competitors include CIE Terminals, ITT Qume, Zentec, Liberty Electronics, Micro-Term, TeleVideo Systems, Wyse Technology, Visual Technology, and many others. These vendors have unveiled their VT220 clones with purchase prices as low as $795. This has caused Digital to lower the price of the VT220 to match that of the independent manufacturers.

When Digital introduced the VT100 in 1978, the company underestimated the demand for that terminal. Orders piled up until a three-to-five month wait for delivery was not uncommon. Into this gap came the independent vendors with their VT100 emulators, and a lucrative emulation market was born. Apparently having learned from this experience, Digital was prepared for the demand for VT200 terminals, and serious shortages of the terminal have not been reported, despite the strong demand generated for the product. The independents, seeking an entry into this market, have turned to price as a weapon. The result has meant savings for the consumer.

DATE OF ANNOUNCEMENT: November 1983.

DATE OF FIRST DELIVERY: November 1983.

NUMBER DELIVERED TO DATE: Over 100,000.

SERVICED BY: Digital Equipment Corporation.

MODELS

The Digital VT200 display terminal family currently consists of three models:

- **VT220—an interactive display for text-oriented applications. The VT220 is a two-piece modular unit consisting of a 12-inch monochrome display/control unit and a detachable keyboard. The display features 80-/132-column display capability and is available with amber, green, or white phosphor characters.**
- **VT240—an interactive display with both text and graphics capabilities. The VT240 is a three-piece modular unit consisting of a 12-inch monochrome display unit, a detachable keyboard, and a system box. The display features 80-/132-column display capability and is available with amber, green, or white phosphor characters. Screen resolution is 800 by 240 pixels. Two graphics instruction sets are available for bit-mapped graphics capability.**
- **VT241—an interactive, graphics-oriented terminal with color. The VT241 is a three-piece modular unit consisting of a 13-inch color display unit, a detachable keyboard, and a system box. The display features 80-/132-column display capability, and has a resolution of 800 by 240 pixels. Two graphics instruction sets are available.**

All models conform to the ANSI X3.64 standard.

TRANSMISSION SPECIFICATIONS

Transmission is asynchronous in full-duplex mode at transmission rates from 50 to 19,200 bits per second. The 7- or 8-bit ASCII code is used. Odd, even, mark, or no parity is selectable from the keyboard. Local echo is standard. An EIA RS-232-C or 20 ma interface is included; also standard is an RS-232-C serial printer port. An integral modem with auto-dial and auto-answer capabilities is optional on the VT241.

DEVICE CONTROL

All VT200 family members provide full VT100 compatibility. VT200 terminals can emulate the operation of the VT100, enabling the user to implement the new terminals without software modifications to existing application programs that support VT100 terminals.

For all VT200 models, transmission is performed on a character-by-character basis as each key is depressed. The selection and storage of local terminal parameters is performed in Set-Up mode. The VT200 terminals provide a plain-language setup menu, which is cursor driven. The set of menus presents plain-language choices in any of three selectable languages: English, German, or French.

Visual attributes available include reverse video and character highlighting. The Selective Erase feature allows the user to select positions on the screen to be erased without erasing the whole screen. Programmable function keys allow the user to store commonly used commands and execute them with a single keystroke. Also featured is a downline loadable character set, allowing as many as 94 characters to be loaded into the terminal from the host, thus enabling users to design special characters for use in specific applications.

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Digital Equipment Corporation
VT200 Video Display Terminal Family

ADVANTAGES AND RESTRICTIONS

The VT200 terminals provide significant price/performance improvements over the VT100. These models incorporate an improved terminal housing design, provide full VT100 compatibility and functionality, and are priced lower than their predecessors. In addition, the VT240 and VT241 have graphics capabilities previously found only on the VT125. Color has also been added to the Digital terminal product line with the VT241.

Significant features carried over from the VT100 terminals include 80-/132-column display capability, and conformance with the ANSI X3.64 standard for control codes. The American National Standards Institute (ANSI) first published the X3.64 standard for two-dimensional data devices in 1977. The goal was to standardize control codes for all terminals, effectively eliminating compatibility problems. The VT100 was the first display terminal to conform to the ANSI standard. In order to provide true Digital emulation, the makers of Digital emulators must also provide ANSI X3.64 code compatibility on their products.

Digital created a display terminal standard with the VT100. The company has succeeded in advancing that standard with the success of the VT200 terminals.

USER REACTION

In Datapro's 1986 User Ratings of Display Terminals conducted in conjunction with *Data Communications* magazine, a total of 68 users responded with ratings for the VT200 family of terminals. These users represented a total installed base of 3,715 units. A total of 53 of these users reported on their experiences with the VT220, totalling 3,258 installed terminals; the remaining 15 users reported on the VT240, covering 457 units. The users were asked to rate their terminals with regard to seven separate categories. The ratings given to the VT200 family terminals by these users are summarized in the following tables:

VT220	Excellent	Good	Fair	Poor	WA*
Overall performance	19	30	2	0	3.3
Ease of operation	27	25	1	0	3.5
Display clarity	26	24	3	0	3.4
Keyboard feel & usability	19	27	6	1	3.2
Ergonomics	14	30	8	1	3.1
Hardware reliability	23	23	5	1	3.3
Mfr.'s maintenance service/technical support	16	32	4	0	3.3

*Weighted Average on a scale of 4.0 for Excellent.

VT240	Excellent	Good	Fair	Poor	WA*
Overall performance	7	7	1	0	3.4
Ease of operation	9	4	2	0	3.5
Display clarity	6	9	0	0	3.4
Keyboard feel & usability	6	8	1	0	3.3
Ergonomics	1	9	5	0	2.7
Hardware reliability	6	8	1	0	3.3
Mfr.'s maintenance service/technical support	8	5	1	1	3.3

*Weighted Average on a scale of 4.0 for Excellent.

When asked whether or not they would recommend the VT200 terminals to other users, 54 of the respondents answered that they would and 4 answered negatively. The remainder were undecided, or chose not to answer the question. □

Both the VT240 and VT241 support two high-level graphics instruction sets: Digital's ReGIS (Remote Graphics Instruction Set) and Tektronix' 4010/4014 graphics protocols. Digital also provides applications software, such as DECgraph and DECslide, to support the graphics features of the VT240 and VT241. The VT241 features color RGB (red/green/blue) output to devices such as a color camera and an auxiliary color monitor. Color graphics print output is also available. All VT200 models feature composite video output, allowing the user to connect auxiliary monitors to the VT200 terminals.

COMPONENTS

CRT DISPLAY UNIT: A 12-inch (diagonally measured), monochrome, nonglare display is standard on the VT220 and VT240. The VT241 includes a 13-inch color display. Terminal control logic is located in the display monitor of the VT220; the VT240 and VT241 include a separate system box which houses terminal logic. Amber, green, or white phosphor characters may be selected for the VT220 and VT240. Four colors (out of a palette of 64) may be displayed on the VT241. A multinational character set (MCS) that includes the full ASCII set is displayable; any of 256 multinational characters can be generated from the keyboard. Also available is the national replacement character set (NRC), which allows users to generate international characters, and is backward compatible with the VT100. A CRT Saver feature, designed to prolong the life of the CRT, is standard on all models.

All models feature selectable display formats of 24 lines of 80 characters, and 24 lines of 132 characters. Character brightness and screen contrast are individually adjustable. The VT200 monitors have a built-in tilt feature for ease of viewing.

KEYBOARD: All models feature a low-profile, detachable keyboard that conforms to the international DIN standard for human engineering. A total of 103 keys are contained on the keyboard, which features a typewriter-style layout, separate numeric pad, and 15 programmable function keys. Function keys may be custom labeled for user-defined applications. All keys feature a sculptured, matte finish and provide an audible key click.

A total of 16 different language keyboards are available for the VT200 terminals; 8 are available in specialilzed word processing configurations. The standard character set generated is multinational.

PRICING

The VT200 family terminals are available for purchase only. Digital Equipment Corporation supports the terminals through its Field Service, available worldwide through over 400 service locations and sales offices. Carry-in service is also available.

EQUIPMENT PRICES

	Purchase Price ($)	Monthly Maint. ($)
VT220	795	12
VT240	2,195	19
VT241	3,195	31

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Digital Equipment Corporation VT200 Video Display Terminal Family

MANAGEMENT SUMMARY

UPDATE: *Since the introduction of the VT200 family of terminals, virtually every independent ASCII terminal vendor has introduced new terminal models with VT200 emulation, hoping to capitalize on a promising market. In fact, demand for Digital's new terminals has been extremely strong; the new product line seems assured of achieving or surpassing the popularity enjoyed by its predecessor, the VT100 family.*

In November 1983, Digital Equipment Corporation introduced its long-awaited VT200 Series of video display terminals. The VT200 terminal family is intended to replace the hugely successful VT100 family in Digital's product line. The new terminals provide full VT100 compatibility, ensuring Digital a ready-made market into which the VT200 can be sold. The VT200s feature a new modular design based on the company's line of personal computer products, and provide the user with an improved price/performance ratio over that found on the VT100 terminals. The demand for the new terminals has been strong, and Digital has already slashed the price tag of the general-purpose VT220, in response to intense price competition from a number of independent terminal makers.

The VT200 family consists of three models: the VT220, VT240, and VT241. The VT220 is the low-end model, a general-purpose interactive display which directly replaces the venerable VT100. Features include a 12-inch monochrome display, 80-/132-column display capability, and a detachable keyboard. The VT240 combines the VT220's text functions with a graphics capability; two graphics protocols are available (Digital's ReGIS and Tektronix'

The VT200 family succeeds the highly popular VT100 terminal family in Digital's terminal product line. The VT200 terminals combine full VT100 compatibility and functionality with a new terminal design and lower price tags. Color graphics, available on the VT241, is a new capability not found on the VT100 terminals.

MODELS: VT220, VT240, and VT241.
DISPLAY: The VT220 and VT240 feature a 12-inch monochrome display; amber, green, or white phosphor characters are available. The VT241 is equipped with a 13-inch color display. All models feature 80-/132-column display capability.
KEYBOARD: All models include a 103-key detachable keyboard. The keyboard features a low-profile design and includes 15 programmable function keys. Sixteen different language keyboards are available.
COMPETITION: CIE Terminals, Lear Siegler, Liberty Electronics, Micro-Term, TeleVideo Systems, Visual Technology, Wyse Technology, and several others.
PRICE: Purchase prices for the VT200 terminals range from $1,395 to $3,195.

CHARACTERISTICS

VENDOR: Digital Equipment Corporation, 146 Main Street, Maynard, MA 01754-2571. Telephone (617) 897-5111.

The Digital VT220 boasts full VT100 compatibility, including 80-/132-column display capability and compatibility with the ANSI X3.64 standard. As was the case with the VT100, several vendors have recently introduced terminals designed to emulate the VT220.

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Digital Equipment Corporation VT200 Video Display Terminal Family

4010/4014). The VT241 is a color text/graphics terminal, combining the features found on the VT220 and VT240 with color display capability and a slightly larger (13-inch) display screen.

The VT200 terminals incorporate a modular enclosure design not found on the older VT100 models. As a result of this design, the VT200 terminals are more compact, and take up less desk space, than the older VT100 models. The VT220 features two-piece construction, including the monitor and keyboard; terminal logic is contained in the monitor housing. The VT240 and VT241 feature three-piece construction, consisting of the monitor, keyboard, and a system box containing the terminal's logic. The VT200 monitors have a wedge-shaped design with a built-in tilt feature; the keyboards incorporate a low-profile design and conform to the DIN standard for ergonomics.

COMPETITIVE POSITION

Digital's VT100 display terminal ranks as the most successful ASCII terminal ever marketed. Since its introduction in 1978, one million VT100s have been shipped, including submodels (VT101, VT102, VT125, VT131, and VT132). An emulation market for the VT100 now flourishes, second in size only to the IBM 3270 emulation market in the display terminal industry. Most major general-purposed-ASCII terminal vendors provide models with some VT100 emulation as part of their product line.

Into this ready-made market comes the VT200 family. Digital imbued the VT200 terminals with full VT100 compatibility, virtually assuring them of a successful product life. Demand for the VT220 in particular has been strong, initially enabling Digital to raise the price of the terminal from $1,295 to $1,395. Since the VT200 introduction,

The VT240 is a monochrome terminal with both text and graphics display capability. Two graphics instruction sets are available for bit-mapped graphics displays. Screen resolution is 800 by 240 pixels.

DATE OF ANNOUNCEMENT: November 1983.

DATE OF FIRST DELIVERY: November 1983.

NUMBER DELIVERED TO DATE: Over 100,000.

SERVICED BY: Digital Equipment Corporation.

MODELS

The Digital VT200 display terminal family currently consists of three models:

- **VT220—an interactive display for text-oriented applications. The VT220 is a two-piece modular unit consisting of a 12-inch monochrome display/control unit and a detachable keyboard. The display features 80-/132-column display capability and is available with amber, green, or white phosphor characters.**
- **VT240—an interactive display with both text and graphics capabilities. The VT240 is a three-piece modular unit consisting of a 12-inch monochrome display unit, detachable keyboard, and a system box. The display features 80-/132-column display capability and is available with amber, green, or white phosphor characters. Screen resolution is 800 by 240 pixels. Two graphics instruction sets are available for bit-mapped graphics capability.**
- **VT241—an interactive, graphics-oriented terminal with color. The VT241 is a three-piece modular unit consisting of a 13-inch color display unit, detachable keyboard, and system box. The display features 80-/132-column display capability, and has a resolution of 800 by 240 pixels. Two graphics instruction sets are available.**

All models conform to the ANSI X3.64 standard.

TRANSMISSION SPECIFICATIONS

Transmission is asynchronous in full-duplex mode at transmission rates from 50 to 19,200 bits per second. The 7- or 8-bit ASCII code is used. Odd, even, mark, or no parity is selectable from the keyboard. Local echo is standard. An EIA RS-232-C or 20 ma interface is included; also standard is an RS-232-C serial printer port. An integral modem with autodial and autoanswer capabilities is optional on the VT241.

DEVICE CONTROL

All VT200 family members provide full VT100 compatibility. VT200 terminals can emulate the operation of the VT100, enabling the user to implement the new terminals without software modifications to existing application programs that support VT100 terminals.

For all VT200 models, transmission is performed on a character-by-character basis as each key is depressed. The selection and storage of local terminal parameters is performed in Set-Up mode. The VT200 terminals provide a plain language set-up menu, which is cursor-driven. The set of menus presents plain language choices in any of three selectable languages: English, German, or French.

Visual attributes available include reverse video and character highlighting. The Selective Erase feature allows the user to select positions on the screen to be erased without erasing the whole screen. Programmable function keys allow the user to store commonly used commands and execute them with a single keystroke. Also featured is a downline loadable character set, allowing as many as 94 characters to be loaded into the terminal from the host, thus enabling users to design special characters for use in specific applications.

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Digital Equipment Corporation
VT200 Video Display Terminal Family

SPECIFICATIONS

MODELS: VT220, VT240, and VT241.
DATE ANNOUNCED: November 1983.
DATE FIRST INSTALLED: November 1983.
NUMBER INSTALLED TO DATE: Over 1 million.

MODELS

The Digital VT200 display terminal family consists of three models:

- VT220—an interactive display for text-oriented applications. The VT220 is a two-piece modular unit consisting of a 12-inch monochrome display/control unit and a detachable keyboard. The display features 80-/132-column display capability and has amber, green, or white phosphor characters.

- VT240—an interactive display with both text and graphics capabilities. The VT240 is a three-piece modular unit consisting of a 12-inch monochrome display unit, a detachable keyboard, and a system box. The display features 80-/132-column display capability and has amber, green, or white phosphor characters. Screen resolution is 800 by 240 pixels. Two graphics instruction sets have bit-mapped graphics capability.

- VT241—an interactive, graphics-oriented terminal with color. The VT241 is a three-piece modular unit consisting of a 13-inch color display unit, a detachable keyboard, and a system box. The display features 80-/132-column display capability, and has a resolution of 800 by 240 pixels. Two graphics instruction sets have bit-mapped graphics capability.

All models conform to the ANSI X3.64 standard.

TRANSMISSION SPECIFICATIONS

Transmission is asynchronous in full-duplex mode at transmission rates from 50.0 to 19.2K bps. The 7- or 8-bit ASCII code is used. Odd, even, mark, or no parity is selectable from the keyboard. Local echo is standard. An EIA RS-232-C or 20 mA interface is included; also standard is an RS-232-C serial printer port. An integral modem with auto dial and auto answer capabilities is optional on the VT241.

DEVICE CONTROL

All VT200 family members provide full VT100 compatibility. VT200 terminals can emulate the operation of the VT100, enabling the user to implement the terminals without software modifications to existing application programs that support VT100 terminals.

For all VT200 models, transmission is performed on a character-by-character basis as each key is depressed. The selection and storage of local terminal parameters is performed in Set-Up mode. The VT200 terminals provide a plain-language setup menu, which is cursor driven. The set of menus presents plain-language choices in any of three selectable languages: English, German, or French.

Visual attributes include reverse video and character highlighting. The Selective Erase feature allows the user to select positions on the screen to be erased without erasing the whole screen. Programmable function keys allow the user to store commonly used commands and execute them with a single keystroke. Also featured is a downline loadable character set, allowing as many as 94 characters to be loaded into the terminal from the host, thus enabling users to design special characters for use in specific applications.

Both the VT240 and VT241 support two high-level graphics instruction sets: Digital's ReGIS (Remote Graphics Instruction Set) and Tektronix' 4010/4014 graphics protocols. Digital also provides applications software, such as DECgraph and DECslide, to support the graphics features of the VT240 and VT241. The VT241 features color RGB (red/green/blue) output to devices such as a color camera and an auxiliary color monitor. Color graphics print output is also available. All VT200 models feature composite video output, allowing the user to connect auxiliary monitors to the VT200 terminals.

COMPONENTS

CRT DISPLAY UNIT: A 12-inch (diagonally measured), monochrome, nonglare display is standard on the VT220 and VT240. The VT241 includes a 13-inch color display. Terminal control logic is located in the display monitor of the VT220; the VT240 and VT241 include a separate system box which houses terminal logic. Amber, green, or white phosphor characters can be selected for the VT220 and VT240. Four colors out of a palette of 64 can be displayed on the VT241. A multinational character set (MCS) that includes the full ASCII set is displayable; any of 256 multinational characters can be generated from the keyboard. Also available is the national replacement character set (NRC), which allows users to generate international characters, and is backward compatible with the VT100. A CRT Saver feature, designed to prolong the life of the CRT, is standard on all models.

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Digital Equipment Corporation
VT200 Video Display Terminal Family

All models feature selectable display formats of 24 lines of 80 characters, and 24 lines of 132 characters. Character brightness and screen contrast are individually adjustable. The VT200 monitors have a built-in tilt feature for ease of viewing.

KEYBOARD: All models feature a low-profile, detachable keyboard that conforms to the international DIN standard for human engineering. A total of 103 keys are contained on the keyboard, which features a typewriter-style layout, separate numeric pad, and 15 programmable function keys. Function keys can be custom labeled for user-defined applications. All keys feature a sculptured, matte finish and provide an audible key click.

A total of 16 different language keyboards are available for the VT200 terminals; 8 are available in specialized word processing configurations. The standard character set generated is multinational.

PRICING

The VT200 family terminals are no longer being actively marketed. Digital still offers service and support, however. □

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Digital Equipment Corporation (DEC) VT200 Video Display Terminal Family

MANAGEMENT SUMMARY

In November 1983, DEC introduced its long-awaited VT200 Series of video display terminals. The VT200 terminal family is intended to replace the hugely successful VT100 family in DEC's product line. The new terminals provide full VT100 compatibility, ensuring DEC a ready-made market into which the VT200 can be sold. The VT200s feature a new modular design based on the company's line of personal computer products, and provide the user with an improved price/performance ratio over that found on the VT100 terminals. The demand for the new terminals has been strong, and some shortages of the products have been reported, reminiscent of the VT100's introduction.

The VT200 family consists of three models: the VT220, VT240, and VT241. The VT220 is the low-end model, a general-purpose interactive display which directly replaces the venerable VT100. Features include a 12-inch monochrome display, 80-/132-column display capability, and a detachable keyboard. The VT240 combines the VT220's text functions with a graphics capability; two graphics protocols are available (DEC's ReGIS and Tektronix' 4010/4014). The VT241 is a color text/graphics terminal, combining the features found on the VT220 and VT240 with color display capability and a slightly larger (13-inch) display.

The VT200 terminals incorporate a modular enclosure design not found on the older VT100 models. As a result of this design, the VT200 terminals are more compact, and take up less desk space, than the older VT100 models. The VT220 features two-piece construction, including the mon-

The VT200 family succeeds the highly popular VT100 terminal family in DEC's terminal product line. The VT200 terminals combine full VT100 compatibility and functionality with a new terminal design and lower price tags. Color graphics, available on the VT241, is a new capability not found on the VT100 terminals.

MODELS: VT220, VT240, and VT241.
DISPLAY: The VT220 and VT240 feature a 12-inch monochrome display; amber, green, or white phosphor characters are available. The VT241 is equipped with a 13-inch color display. All models feature 80-/132-column display capability.
KEYBOARD: All models include a 103-key detachable keyboard. The keyboard features a low-profile design and includes 15 programmable function keys. Sixteen different language keyboards are available.
COMPETITION: CIE Terminals, Lear Siegler, Liberty Electronics, Micro-Term, TeleVideo Systems, Visual Technology, Wyse Technology, and several others.
PRICE: Purchase prices for the VT200 terminals range from $1,395 to $3,195.

CHARACTERISTICS

VENDOR: Digital Equipment Corporation (DEC), 146 Main Street, Maynard, MA 01754. Telephone (617) 897-5111.

The VT220 is the low-end model in DEC's new VT200 terminal family. The VT220 features two-piece modular construction, with a 12-inch monochrome display and a detachable, low-profile keyboard. As with all of the new VT200 terminals, the VT220 boasts full DEC VT100 compatibility, including 80-/132-column display capability and compatibility with the ANSI X3.64 standard. As was the case with the VT100, several vendors have recently introduced terminals designed to emulate the VT220.

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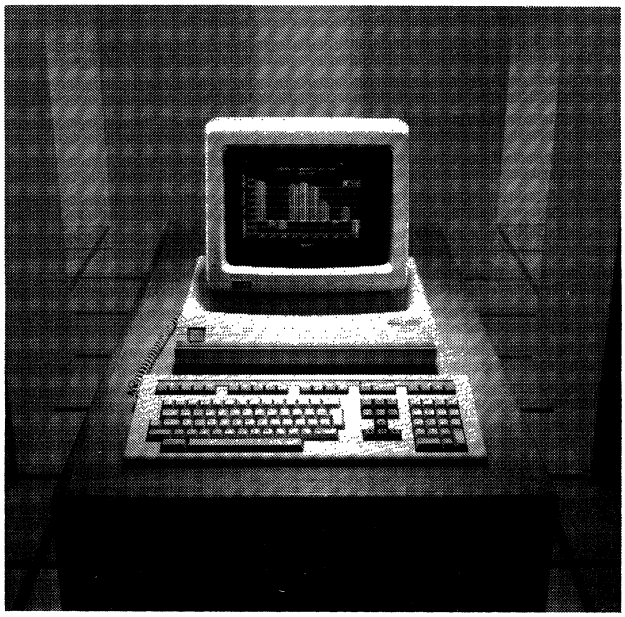
Digital Equipment Corporation (DEC)
VT200 Video Display Terminal Family

itor and keyboard; terminal logic is contained in the monitor housing. The VT240 and VT241 feature three-piece construction, consisting of the monitor, keyboard, and a system box containing the terminal's logic. The VT200 monitors have a wedge-shaped design with a built-in tilt feature; the keyboards incorporate a low-profile design and conform to the DIN standard for ergonomics.

COMPETITIVE POSITION

DEC's VT100 display terminal ranks as the most successful ASCII terminal ever marketed. Since its introduction in 1978, over 500,000 VT100s have been shipped; an additional 200,000 VT100 submodels (VT101, VT102, VT125, VT131, and VT132) have also been sold. An emulation market for the VT100 now flourishes, second in size only to the IBM 3270 emulation market in the display terminal industry. Most major general-purpose ASCII terminal vendors provide models with some VT100 emulation as part of their product line. Dataquest, a San Jose, California-based market research firm, estimates that DEC holds better than a 60 percent share of the VT100 market, a market that accounted for shipments of well over 200,000 units in 1983. TeleVideo Systems, the leading independent display terminal manufacturer, predicted that shipments of DEC-compatible terminals would hit the 300,000 mark in 1984.

Into this ready-made market comes the VT200 family. DEC imbued the VT200 terminals with full VT100 compatibility, virtually assuring them of a successful product life. Demand for the VT220 in particular has been brisk, enabling DEC to raise the price of the terminal from $1,295 to $1,395. Since the VT200 introduction, several vendors have introduced VT200 emulators, most of them emulating the VT220. These competitors include TeleVideo, as well as CIE Terminals, Lear Siegler, Liberty Electronics,



The VT240 is a monochrome terminal with both text and graphics display capability. Two graphics instruction sets are available for bit-mapped graphics displays. Screen resolution is 800 by 240 pixels.

DATE OF ANNOUNCEMENT: November 1983.

DATE OF FIRST DELIVERY: November 1983.

NUMBER DELIVERED TO DATE: Over 60,000.

SERVICED BY: Digital Equipment Corporation.

MODELS

The DEC VT200 display terminal family currently consists of three models:

- **VT220—an interactive display for text-oriented applications. The VT220 is a two-piece modular unit consisting of a 12-inch monochrome display/control unit and a detachable keyboard. The display features 80-/132-column display capability and is available with amber, green, or white phosphor characters.**

- **VT240—an interactive display with both text and graphics capabilities. The VT240 is a three-piece modular unit consisting of a 12-inch monochrome display unit, detachable keyboard, and a system box. The display features 80-/132-column display capability and is available with amber, green, or white phosphor characters. Screen resolution is 800 by 240 pixels. Two graphics instruction sets are available for bit-mapped graphics capability.**

- **VT241—an interactive, graphics-oriented terminal with color. The VT241 is a three-piece modular unit consisting of a 13-inch color display unit, detachable keyboard, and system box. The display features 80-/132-column display capability, and has a resolution of 800 by 240 pixels. Two graphics instruction sets are available.**

All models conform to the ANSI X3.64 standard.

TRANSMISSION SPECIFICATIONS

Transmission is asynchronous in full-duplex mode at transmission rates from 50 to 19,200 bits per second. The 7- or 8-bit ASCII code is used. Odd, even, mark, or no parity is selectable from the keyboard. Local echo is standard. An EIA RS-232-C or 20 ma interface is included; also standard is an RS-232-C serial printer port. An integral modem, with autodial and autoanswer capabilities, is optional on the VT241.

DEVICE CONTROL

All VT200 family members provide full VT100 compatibility. VT200 terminals can emulate the operation of the VT100, enabling the user to implement the new terminals without software modifications to existing application programs that support VT100 terminals.

For all VT200 models, transmission is performed on a character-by-character basis as each key is depressed. The selection and storage of local terminal parameters is performed in Set-Up mode. The VT200 terminals provide a plain language set-up menu, which is cursor-driven. The set of menus presents plain language choices in any of three selectable languages: English, German, or French.

Visual attributes available include reverse video and character highlighting. The Selective Erase feature allows the user to select positions on the screen to be erased without erasing the whole screen. Programmable function keys allow the user to store commonly used commands and execute them with a single keystroke. Also featured is a downline loadable character set, allowing as many as 94 characters to be loaded into the terminal from the host, thus enabling users to design special characters for use in specific applications.

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Digital Equipment Corporation (DEC)
VT200 Video Display Terminal Family

TABLE 1. DEC VT220 EMULATORS

Vendor	Model	Screen Size	80-/132-Column Display	Price* ($)
CIE Terminals	CIT-220+	12	Yes	1,195
Cybernex	RG-220	14	Yes	—
Lanpar Technologies	Vision 2200+	12	Yes	1,195
Lear Siegler	ADM 220	12	Yes	1,165
Liberty	Freedom 220	12/14	Opt.	795-845
Micro-Term	Ergo 320	12	Yes	—
Plessey	PT-220	12	Yes	—
TeleVideo	922	12	Yes	995
Visual	Visual 220	14	Yes	995
Wyse	WY-85	14	Yes	799
Zentec	DD220	14	Yes	850

Based on single-quantity

Wyse Technology, Visual Technology, and some others. Table 1 provides a summary of the VT220 emulating terminals currently on the market.

At the time of the VT200 announcement, DEC also announced that it will continue the production of the VT100 for at least two more years, or possibly longer if demand for them still exists. The submodels of the VT100 have been placed in maintenance mode, meaning DEC will continue to support them but has ceased their production.

ADVANTAGES AND RESTRICTIONS

The VT100 achieved its success despite a relatively high price tag. The terminal's enhanced features (most notably its full-screen 132-column display capability) and high degree of functionality were key factors in the VT100's early success; later, as prices for display terminals plunged, the VT100 persevered chiefly because it had become a standard in the industry.

The VT200 terminals provide significant price/performance improvements over the VT100. The new models incorporate a new terminal housing design, provide full VT100 compatibility and functionality, and are priced lower than their predecessors. In addition, the VT240 and VT241 have graphics capabilities previously found only on the VT125. Color has also been added to the DEC terminal product line with the VT241.

Significant features carried over from the VT100 terminals include 80-/132-column display capability, and conformance with the ANSI X3.64 standard for control codes. The American National Standards Institute (ANSI) first published the X3.64 standard for two-dimensional data devices in 1977. The goal was to standardize control codes for all terminals, effectively eliminating compatibility problems. The VT100 was the first display terminal to conform to the ANSI standard. In order to provide true DEC emulation, the makers of DEC emulators must also provide ANSI X3.64 code compatibility on their products.

Both the VT240 and VT241 support two high-level graphics instruction sets: DEC's ReGIS (Remote Graphics Instruction Set) and Tektronix' 4010/4014 graphics protocols. DEC also provides applications software, such as DECgraph and DECslide, to support the graphics features of the VT240 and VT241. The VT241 features color RGB (red/green/blue) output to devices such as a color camera and an auxiliary color monitor. All VT200 models feature composite video output, allowing the user to connect auxiliary monitors to the VT200 terminals.

COMPONENTS

CRT DISPLAY UNIT: A 12-inch (diagonally measured) monochrome nonglare display is standard on the VT220 and VT240. The VT241 includes a 13-inch color display. Terminal control logic is located in the display monitor of the VT220; the VT240 and VT241 include a separate system box which houses terminal logic. Amber, green, or white phosphor characters may be selected for the VT220 and VT240. Four colors (out of a palette of 64) may be displayed on the VT241. A multinational character set that includes the full ASCII set is displayable; any of 256 multinational characters can be generated from the keyboard. A CRT Saver feature, designed to prolong the life of the CRT, is standard on all models.

All models feature selectable display formats of 24 lines by 80 characters, and 24 lines of 132 characters. Character brightness and screen contrast are individually adjustable. The VT200 monitors have a built-in tilt feature for ease of viewing.

KEYBOARD: All models feature a low-profile, detachable keyboard which conforms to the international DIN standard for human engineering. A total of 103 keys are contained on the keyboard, which features a typewriter-style layout, separate numeric pad, and 15 programmable function keys. Function keys may be custom-labeled for user-defined applications. All keys feature a sculptured, matte finish and provide an audible key click.

A total of 16 different language keyboards are available for the VT200 terminals; 8 are available in specialilzed word processing configurations. The standard character set generated is multinational.

PRICING

The VT200 family terminals are available for purchase only. DEC supports the terminals through its Field Service, available worldwide in over 400 service locations and sales offices. Carry-in service is also available.

	Purchase Price ($)	Monthly Maint. ($)
VT220	1,395	6
VT240	2,195	16
VT241	3,195	23

DEC created a display terminal standard with the VT100. The company's ad campaign for the VT200 boasts that they are now "Advancing the Standard." With the success that the new VT200 terminals have already enjoyed, it would appear that DEC has indeed succeeded in doing so. □

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