

## PRODUCT DATA SHEET

### INTRODUCTION

The Model 2236DW Integrated Terminal, developed by Wang Laboratories, Inc., supports both word processing and data processing applications. The terminal enables a user to communicate with a 2200MVP, LVP, SVP, or VP Central Processing Unit (CPU). The 2236DW terminal supports an optional 2200/WP Word Processing Software Package enabling users to add word processing capabilities that are similar to those available on Wang's Word Processor, Office Information Systems, and integrated VS Systems.

Additionally, the 2236DW Integrated Terminal gives the programmer the ability to create highlighted displays, to utilize special graphic characters, and to draw boxes at any screen location. Screen displays may be altered using various commands to allow maximum flexibility of program output.

Other special features of the terminal include an interface for a terminal printer, self-test diagnostics, repeating keys, and the ability to print the CRT display to an attached printer.

### WORD PROCESSING SOFTWARE

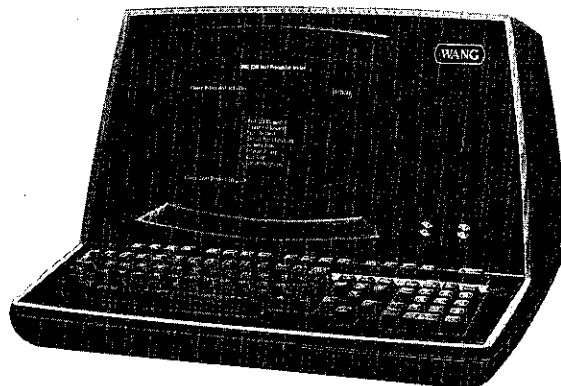
With the addition of the 2236DW Integrated Terminal to the 2200 Series Product Line, users may now perform word processing and data processing applications at the same terminal. The 2200/WP Word Processing Software allows the user to execute word processing functions quickly and efficiently. The software is document oriented, thereby allowing complete documents rather than individual pages to be created, edited, or printed.

The 2200/WP Word Processing Package includes features such as operator prompts and automatic word wraparound. Other operational features include automatic indexing for superscripts and subscripts; automatic centering, indenting, and decimal alignment; global search and replace; text movement; text copy; and right-margin justification.

# 2200

## MODEL 2236DW INTEGRATED TERMINAL

- Supports Wang 2200/WP Word Processing Software
- Word Processing Style Cursor Control Keys
- Integrated Word Processing and Data Processing Functions
- Repeating Keys and Underlined Characters
- Box and Character Graphic Capabilities
- Character Display Attributes
- Interface to a Terminal Printer for Local Print Output



# WANG

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Among the powerful editing capabilities are the insertion and deletion of characters, words, lines, paragraphs, or entire sections of text. Another special feature is Glossary, which allows the operator to record commonly used words, phrases, or standard paragraphs, that may be recalled and displayed on the screen with only two keystrokes.

**TERMINAL KEYBOARD**

The 2236DW keyboard supports both uppercase and lowercase characters. Control functions are handled by several types of function keys. The keyboard has two modes of operation, selected by a toggle switch labeled A/A and A/a. The dual mode keyboard is designed for both data processing and word processing applications.

In Programmer's mode (A/A), uppercase alphabetic characters are produced, whether the keyboard is shifted or unshifted. Shifted numeric keys produce symbols and special characters. In Operator's mode (A/a), the keyboard functions as a standard typewriter, producing uppercase and special characters when shifted, and producing lowercase and numeric characters in unshifted operation.

The 2236DW also includes a Caps Lock feature. In either A/A or A/a mode, Caps Lock, activated by

pressing the Lock key, produces uppercase alphabetic characters; all other characters, such as the numeric keys, are lowercase.

The integrated keyboard, illustrated in Figure 1, is divided into four zones. Zone 1 contains alphanumeric characters and special characters, arranged as a standard typewriter keyboard. Zone 2 contains cursor control and editing keys for both word processing, data entry, and editing operations. The editing operations provide capabilities for editing immediate mode statements and alphanumeric characters, either in a line of program text resident in memory or in a statement currently being entered. Zone 3 is a numeric keypad designed for rapid entry of numbers. Zone 4 is comprised of 16 Word Processing/Special Function keys.

When using the word processing software, the Word Processing Function keys simplify document creation and revision. For example, the CENTER key automatically centers a line of text, the MOVE key allows any amount of text to be moved within a document, and the REPLC key allows a character-defined sequence to be replaced with another within a document.

The Word Processing Function keys also serve as

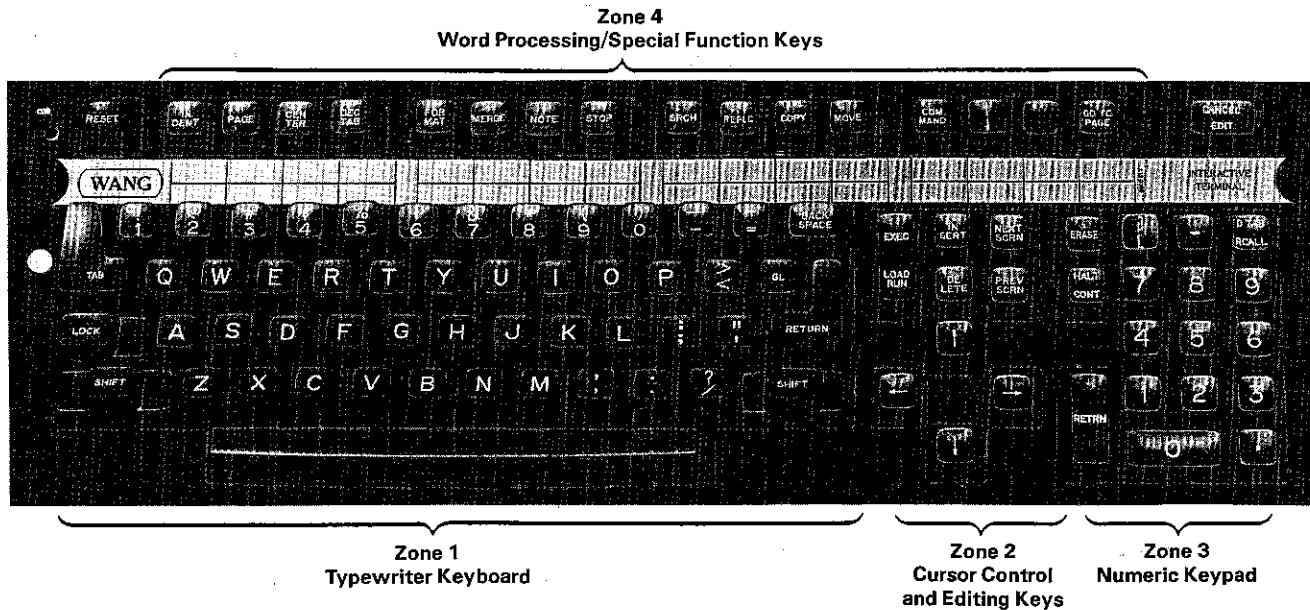


Figure 1. Model 2236DW Keyboard

Special Function keys that can be used by the programmer to perform up to 32 program-defined functions. For example, Special Function keys can be defined to initiate program execution, access subroutines, or enter a predefined text string. Additionally, the TAB key and the GL key in Zone 1 can be used as Special Function keys.

The keys are well designed and are ideally suited for high-speed typing or data entry. Positive response keys provide adjustable audio feedback when they are touched with sufficient pressure to ensure entry of a character. An experienced typist need not "bottom out" a key to ensure entry, thereby increasing input speed and lessening the need to verify entry by checking the CRT. A program-controlled audio alarm with adjustable volume can also be used to minimize operator monitoring by signaling when special conditions occur.

The keyboard allows characters to be underlined. On non-English versions of the keyboard, characters can also be accented. All keys on the keyboard will repeat if held down. The microprocessor in the terminal adjusts the repeat interval according to the data transfer rate, sounding the keyboard clicker each time the character is transmitted. Thus, the user can both see and hear the character being repeated.

#### **CRT DISPLAY**

The 2236DW Integrated Terminal contains a 12-inch (30.5 centimeter) diagonal measure Cathode Ray Tube (CRT) screen display. The CRT displays a full 128-character set, including uppercase and lowercase keyboard characters, some foreign language characters, special symbols, and underlining. The CRT also displays an alternate character set of graphic characters and box graphics. All characters may be displayed using one or more of several character display attributes.

The CRT has a 24-line, 80 characters-per-line capacity (1,920 character positions) for full-screen operator prompting and verification of keyed characters. Brightness and contrast controls provide a sharp, clear image on the screen. Display speed is approximately 2,000 characters per second at 19,200 baud.

A cursor, resembling an underscore, indicates the location on the display where the next character will appear. In addition to controlling cursor movement and positioning from the keyboard, a number of codes can be used to manipulate the cursor under program control for specially formatted displays.

#### **CHARACTER DISPLAY ATTRIBUTES**

The 2236DW Integrated Terminal defines a character display attribute for each position on the CRT display. By using special codes before displaying a character or string of characters, the programmer can cause the output to be bright or normal intensity, blinking or non-blinking, underlined, or reversed video (dark characters on a light field).

More than one attribute may be assigned to a character to allow, for example, both reversed video and blinking portions on a screen display. Error messages, input fields, and other special notes can have particular attention drawn to them by using the appropriate character attributes. Since character attributes do not occupy any display space, a programmer need not worry about alignment problems.

#### **GRAPHIC CAPABILITIES**

The 2236DW Integrated Terminal uses both an alternate character set and normally unused portions of each character position to create remarkable graphics capabilities for a terminal in its price range. Box graphics allow line segments to be drawn at any character position. Character graphics, which display geometric designs rather than the normal characters, are an alternate character set.

#### **Box Graphics**

Box graphics are used for drawing horizontal or vertical lines on the screen, enabling forms to be depicted, or fields to be separated by lines or boxes. Horizontal lines are drawn between character lines on the CRT screen, while vertical lines are drawn through the center of character positions.

Characters contained within the confines of a box will not interfere with the line segments. For example, within a boxed area used to highlight a prompt, the prompt may be rewritten a number of times without altering or erasing the box itself. Consequently, box graphics may

be used to increase the readability of a dense display without greatly reducing the capacity of that display. A special BASIC-2 statement, the PRINT BOX statement, can be used to draw any size box beginning at the current cursor location on the screen.

### **Character Graphics**

Character set graphics comprise an alternate set of display characters on the 2236DW Integrated Terminal. They are similar to standard characters in that each character graphic occupies one position on the CRT display.

Character graphics are created by dividing the normal character position into six equal areas (three vertically by two horizontally). Certain character codes then cause one or more of these areas to be displayed on the screen at the current cursor position. Adjacent areas of two graphic characters will touch, making it possible to create continuous light or dark areas on the screen. When combined with display attributes, character graphics are useful for the construction of bar graphs, histograms, and other special displays.

### **TERMINAL/CPU INTERFACE**

Each 2236DW Integrated Terminal is connected to either a 2236MXD Terminal Processor or a 22C32 Triple Controller when configured with a 2200MVP, LVP, or VP Central Processing Unit. (Existing controllers must be revised to current standards to support the 2236DW terminal.) These devices handle I/O operations between the CPU and the terminals, and buffer data entered from or transferred to the terminals.

The 2236MXD Terminal Processor is used on the 2200MVP CPU, which can support twelve terminals (four per terminal processor). The Model 2236MXD is also used on the 2200LVP, which can support four terminals. Since 2200/WP Word Processing Software requires 28K of user memory per terminal, the maximum number of terminals that can simultaneously operate WP varies with available user memory. The 22C32 Triple Controller supports a single terminal and can be used on the 2200VP, MVP, and LVP CPU. The 2236DW plugs directly into the terminal connector on back of the SVP CPU; no additional controllers are necessary.

Model 2236DW terminals can be attached locally to the 2200MVP or LVP CPU at distances up to 2,000 feet (606.1 meters), or remotely via modems and

telephone lines. However, terminals connected to a 2200SVP or VP CPU can be attached locally at a maximum distance of 50 feet (15.2 meters) and 2,000 feet (606.1 meters) respectively. Communication between the terminal and the CPU is asynchronous and full-duplex, with selectable line speeds ranging from 300 to 19,200 bits per second. To accelerate communications between the terminals and the CPU, the system performs automatic data compression on information transmitted to each terminal.

Each 2236DW can support its own terminal printer that can be used for program output. Additionally, hard copy of CRT displays can be created at each terminal site. A dump of the display screen to the terminal printer may be initiated from the keyboard, resulting in the printing of all standard characters present on the screen. The screen dump feature requires no special software and can be performed at any time.

The 2236DW and its controller employ microprocessors to optimize data throughput. For example, strings of four or more identical characters are compressed for transmission into three-byte blocks. A ready/busy protocol controls information flow between the terminals and the terminal processor. Thus, it is unnecessary for the attached printer to keep up with the serial communication line data rate. These features are automatic and are completely transparent to the software executing in the 2200 CPU.

As an added feature, the 2236DW performs self-testing diagnostics every time it is turned on. These diagnostics ensure optimal terminal condition before use. If the unit fails one of the tests, a continuous alarm sounds, alerting the user to the failure. The tests allow a Wang Customer Service Representative to quickly identify the problem and minimize downtime.

The 2236DW terminal also incorporates a power supply that relies on air convection cooling, rather than a fan. This feature provides quiet terminal operation.

Any standard Wang printer or plotter with a 36-pin cable connection may be plugged into the printer connector on the 2236DW Integrated Terminal. A Wang-supplied direct-connection cable or an optional modem cable plugs into a RS-232-C-compatible connector on the terminal.

## MODEL 2236DW SPECIFICATIONS

### Size

Height .....	13.5 in. (34.3 cm)
Depth .....	20.5 in. (52.1 cm)
Width .....	19.8 in. (50.3 cm)

### Weight

41 lb (18.6 kg)

### CRT

Display Size .....	12.0 in. diagonal (30.5 cm)
Capacity .....	24 lines, 80 characters/line

### Character Size

Height .....	0.16 in. (0.41 cm)
Width .....	0.09 in. (0.23 cm)

### Character Set

128 characters, including uppercase and lowercase letters; each character is assigned one or more attributes for high- or low-intensity display, blinking, reverse video, or underlining. Additional alternate character set consisting of 64 graphic characters and other special symbols is supplied. Also capable of displaying line-segment (box) graphics, separate from either character set.

### Power Requirements

115 or 230 VAC  $\pm$  10%  
50 or 60 Hz  $\pm$  1.0 Hz  
50 Watts

### Fuses

2 amps (SB) @ 115 V/60 Hz  
1 amp (SB) @ 230 V/50 Hz

### Operating Environment

Temperature  
50° to 90° F (10° to 32° C)  
Relative Humidity  
35% to 65% noncondensing (recommended)  
20% to 80% noncondensing (allowable)

### Transmission Rate

Manually selectable for each terminal at 300, 600, 1200, 2400, 9600, or 19,200 baud

### Character Format

11 bits/character  
(1 start bit, 8 data bits, odd parity bit, 1 stop bit)

### Cabling

One 8-ft (2.4 m) cable to power source. One 25-ft (7.6 m) direct connection cable is provided with each 2236DW Integrated Terminal, unless an optional direct connection cable is ordered for a terminal. Non-extendable cables are available optionally in 100-ft (30.3 m) increments for direct connection up to 1,000 ft (303.0 m). Additional direct connection cables are available in lengths of 1,250 ft (378.8 m), 1,500 ft (454.5 m), 1,750 ft (530.3 m) and 2,000 ft (606.1 m).

Modem cables are available optionally in lengths of 12 ft (3.7 m), with extensions of 25 ft (7.6 m) and 50 ft (15.2 m). Maximum combined cable distance however, from Wang equipment to a modem is 50 ft (15.2 m) according to EIA standards.

## ORDERING SPECIFICATIONS

The integrated terminal must contain a Cathode Ray Tube (CRT) display screen, and an uppercase/lowercase keyboard with a numeric keypad and a cursor control keypad. The CRT must be capable of displaying 24 lines, each 80 characters in length, and measure 12 inches diagonally. Eighteen Special Function keys, which can access 36 user-defined functions, must also be available. Uppercase and lowercase alphabetic and special characters must be capable of being keyed and displayed on the terminal screen. The terminal must contain, in addition to the standard character set, an alternate set consisting of 64 graphic characters each composed of one or more of six square divisions of the character position. Line-segment graphics must be able to be drawn in each character position without interference from character commands. Each character position must have a character display attribute assigned that allows high- or low-intensity display, blinking or non-blinking, underlining, and standard or reversed video. Screen dumps to a terminal printer, self-test diagnostics, and repeating keys must all be standard features. The terminal must support an optional word processing software application package.

*Standard Warranty Applies*

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