

# PRODUCT BULLETIN

# NO.190

## MODEL 2236DW INTEGRATED TERMINAL PRODUCT BULLETIN



### INTRODUCTION

Wang Laboratories, Inc., is pleased to announce the addition of a new terminal for the 2200 family of computer systems -- the Model 2236DW Integrated Terminal. This new microprocessor-controlled terminal offers our customers the many sophisticated features of the 2236DE terminal with a keyboard layout capable of supporting Wang 2200/WP Word Processing Software. These features include:

- . Word Processing Style Cursor Control and Function Keys supporting Integrated Word Processing and Data Processing Functions
- . Repeating Keys and Underlined Characters
- . Character Display Attributes (bright, blinking, underlining, and reverse video)
- . Graphics Character Set
- . Box Graphics
- . Interface to a Terminal Printer for Local Print Output
- . Self-test Diagnostics
- . Quiet Operation

Terminal features, such as character display attributes, character graphics, and box graphics, can be implemented with a minimum of programming effort with the 2200 operating systems.

**WANG**

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## 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 System 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 Software 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.

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 terminal is designed for users who are already familiar with a standard typewriter keyboard and numeric keypad. The keyboard, illustrated in Figure 1, is the operator's means of interactively communicating with and controlling the system. By using the keyboard, an operator can enter data, write programs, perform calculations, and enter commands to the processor.

The 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. (Refer to Table 1 for a detailed listing of the performance of the keys in each different operating mode.)

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.

## Zone 4 Word Processing/Special Function Keys



Zone 1  
Typewriter Keyboard

Zone 2  
Cursor Control  
and Editing Keys

Zone 3  
Numeric Keypad

Figure 1. The Model 2236DW Keyboard

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 automatically adjusts the repeat key rate according to the rate at which characters are being echoed to the CRT. The keyboard clicker sounds each time the repeated character is transmitted. Thus, both aural and visual evidence of the repeated character are given to the user. (The repeating key is particularly useful for moving the cursor when editing.)

Special features of the Model 2236DW keyboard include the following.

- . Keyboard Clicker -- The clicker provides audio feedback when a key is sufficiently pressed. The volume of the keyboard clicker may be adjusted.
- . N-key Rollover -- This feature permits a new key to be pressed and output to the terminal while a previous key is still being held down. This process can continue for any number of keys; each new key pressed takes precedence over any keys already held down. The N-key rollover feature helps eliminate errors during high-speed typing.
- . Terminal Alarm -- The alarm provides audio feedback to indicate the occurrence of errors or special conditions, e.g., pressing an undefined Special Function key, typing beyond a specified field, displaying an error message. The volume of this audio alarm may also be adjusted.

The RESET key, located in the upper-left corner of the keyboard, immediately stops program execution, listing, and I/O operations; clears the CRT; homes the cursor; signals ready; and returns to the console user (Console Input mode). RESET is also used during Master Initialization and hardware diagnostic operations. The RESET key is an undesirable means of terminating execution and generally should not be used to end program execution; HALT should be used for this purpose. As a protective feature, RESET and HALT are active only in Programmer's mode (A/A), and only if pressed in conjunction with the SHIFT key.

NOTE

On a 2200MVP or LVP, RESET affects only the partition to which the terminal is currently attached (the terminal's foreground partition). No other partitions are affected by RESET.

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Table 1. Operation of Keyboard Modes

	A/A mode	A/a mode
Unshifted Operation	Alpha Keys -- Uppercase Punctuation -- Lowercase Numerics -- Lowercase (numbers) Special Function -- '0 to '15 CONTINUE -- Active HALT -- Inactive RESET -- Inactive ERASE -- From cursor position LOAD RUN key -- RUN	Alpha Keys -- Lowercase Punctuation -- Lowercase Numerics -- Lowercase (numbers) Special Function -- '0 to '15 CONTINUE -- Active HALT -- Inactive RESET -- Inactive ERASE -- From cursor position LOAD RUN key -- RUN
Caps Lock Operation	Alpha Keys -- Uppercase Punctuation -- Lowercase Numerics -- Lowercase (numbers) Special Function -- '0 to '15 CONTINUE -- Active HALT -- Inactive RESET -- Inactive ERASE -- From cursor position LOAD RUN key -- RUN	Alpha Keys -- Uppercase Punctuation -- Lowercase Numerics -- Lowercase (numbers) Special Function -- '0 to '15 CONTINUE -- Active HALT -- Inactive RESET -- Inactive ERASE -- From cursor position LOAD RUN key -- RUN
Shifted Operation	Alpha Keys -- Uppercase Punctuation -- Uppercase Numerics -- Uppercase (symbols) Special Function -- '16 to '31 CONTINUE -- Inactive HALT -- Active RESET -- Active ERASE -- Line Erase LOAD RUN key -- LOAD	Alpha Keys -- Uppercase Punctuation -- Uppercase Numerics -- Uppercase (symbols) Special Function -- '16 to '31 CONTINUE -- Inactive HALT -- Inactive RESET -- Inactive ERASE -- Line Erase LOAD RUN key -- LOAD

For convenience of discussion, the keyboard has been divided into the following four physical zones. Refer to Figure 1.

Zone 1 - Typewriter Keyboard -- Similar to a standard typewriter, this zone contains the alphanumeric characters; special characters (e.g., #, \$, %); the numeric operators (+, \*, /, -, ^); and the TAB, GL, RETURN, and SHIFT keys. The GL key provides Special Function '124 when unshifted and '125 when shifted; the TAB key provides Special Function '126 when unshifted and '127 when shifted (refer to the description of Zone 4).

Zone 2 - Cursor Control and Editing Keys -- This zone contains Editing keys (INSERT and DELETE), Location keys (NEXT SCRNL and PREV SCRNL), and Cursor Control keys (controls movement of cursor in indicated direction -- up, down, right, and left).

Zone 3 - Numeric Keypad -- The numeric zone is designed like a standard 10-key numeric pad for rapid entry of numeric characters. The numeric keys are grouped here for convenience. Digits may be entered by using the numeric keys in either the numeric or the alphanumeric zone. This zone also includes such keys as ERASE, HALT/CONT, and RETRN.

Zone 4 - Word Processing/Special Function Keys -- Across the top of the keyboard are 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 keys also serve as Special Function keys that can be set up by the programmer to perform program-defined functions. Since each of these keys may be pressed in conjunction with the SHIFT key, a total of 32 Special Function keys is available. The keys are numbered '0 -- '15 (lowercase) and '16 -- '31 (uppercase). Simultaneously pressing a key numbered '0 -- '15 with SHIFT accesses a key from '16 -- '31. The function key number is labeled on the front surface of each key. Additionally, the TAB key and the GL key in Zone 1 can be used as Special Function keys.

Special Function keys may be used to perform a variety of tasks, e.g., start program execution, access subroutines, or enter a predefined text string. The operator is informed of the meanings of the Special Function keys either by screen prompts or by means of the label strip located immediately below this row of keys. In order to perform a given task, a Special Function key must be defined by the user with a DEFFN' statement in the currently loaded program. The Special Function keys are also used during Master Initialization to load the BASIC-2 interpreter and operating system.

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## 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.

## 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 12 terminals (4 per terminal processor). The Model 2236MXD is also used on the 2200LVP, which can support 4 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 2000 feet (606.1 meters), or remotely via modems and telephone lines. Terminals connected to a 2200SVP or VP CPU can be attached locally at a maximum distance of 50 feet (15.2 meters) and 2000 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 (bps). 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 which 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 3-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.

## THE SCREEN DUMP

The screen dump feature allows the user to obtain a hard copy record of the CRT on a printer attached to the terminal. Screen dump is a temporary off-line terminal operation which may be initiated only by the terminal operator. In fact, a BASIC-2 program can neither initiate nor detect the activation of a screen dump. Therefore, the screen dump may be used to preserve hard copy records of the screen even after the program has stopped with an error or after a CPU failure. However, this also means it is the terminal operator's responsibility not to activate screen dump while the terminal printer is in use. If screen dump is activated while a program is using the printer, the screen dump output will be inserted on its own separate page, and printing will then resume without missing any characters. To activate a screen dump, use the following procedure.

1. Press the EDIT key and hold it down for approximately two seconds. An immediate click will be heard. The CRT image will be frozen with the image to be dumped.
2. When a second click is sounded, the screen dump has been activated. (If the EDIT key is released before the second click is heard, the key is treated as the EDIT key and the screen image is unfrozen.)
3. The screen image is transmitted to the printer, preceded by a carriage return and form feed, which neatly formats the output. (If a screen dump is activated while a program is using the printer, the screen dump output will be inserted on its own separate page.)
4. The screen dump ends with another form feed.
5. Normal processing of output from the CPU is resumed. (No data is lost, even if the CPU has attempted output to the CRT or printer while the screen dump was in progress.)

During a screen dump, the keyboard remains active. Pressing any key will terminate the screen dump and restore normal processing. If the screen dump fails, make sure the printer is selected and try again. If the screen dump still fails, use the CLEAR button found on many printers. Do not use the terminal's RESET, because it will clear the screen.

It is not possible for a screen dump to produce an exact image of the screen because the terminal microprocessor cannot tell what sort of printer is attached to the terminal. A conservative subset of the CRT character set is therefore employed during a screen dump. The USA version of the Model 2236DW can screen dump all characters between HEX(20) and HEX(7E), including all uppercase and lowercase characters on the keyboard. Underlined characters are translated to their nonunderlined equivalents. The actual character set used for screen dump varies among the international versions of the terminal. However, the following general rules do apply.

1. Any character not in the screen dump character set is translated to the number symbol (#).
2. Display attributes are ignored. All characters are printed in the same font and pitch.
3. Character set graphics are also translated to the number symbol (#).
4. Box graphics are ignored.

#### CAUTION

Since normal printing is interrupted when a screen dump is requested, the screen dump will be inserted into a report already printing. Although screen dumps eject a page before and after a dump, the user's report may be temporarily halted in the middle of the page. For some reports, this may be acceptable, but for preprinted forms such as invoices or customer statements, a screen dump which interrupts current printing could present problems.

## NOTE

The remainder of this product bulletin primarily deals with programming considerations for obtaining character display attributes, character graphics, and box graphics. The 2200/WP Word Processing Software System and other application software require no special programming knowledge. These software applications will already have implemented many features of the 2236DW terminal.

### CHARACTER DISPLAY ATTRIBUTES

In order to highlight information on the screen, the Model 2236DW provides several display attributes that can be selected for any character displayed on the screen. The available display attributes are the following.

- . Bright -- Characters are displayed in high intensity.
- . Blink -- Characters blink.
- . Reverse Video -- The character itself is dark while the character background display is light (dark on light).
- . Underline -- Characters are displayed with an underscore.

### HEX Codes Used to Invoke Display Attributes

Immediately after power is turned on, the Model 2236DW displays characters in normal intensity, non-blinking, normal video (light on dark), and non-underlined (this attribute shall henceforth be referred to as simply "normal intensity"). The power-on default meaning of HEX(OE) is bright, non-blinking, normal video, and non-underlined.

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The display attribute to be used is selected by sending a command of the following form to the CRT.

HEX(02 04 xx yy 0E)  
or  
HEX(02 04 xx yy 0F)

where:

02 04 = The control code sequence which indicates to the terminal that special character display attributes are to be selected.

xx yy = The HEX codes specifying the display attributes to be selected, where:

xx = 00 for normal intensity, no blink  
02 for bright, no blink  
04 for normal intensity, blinking  
0B for bright, blinking

yy = 00 for normal video, no underline  
02 for reverse video  
04 for underline  
0B for reverse video, underline

0E or 0F = A terminator character which causes the display attributes selected by xx yy to be turned on or off; HEX(0E) turns the selected attributes on, HEX(0F) turns them off.

Note that there are two ways to code the attribute "blinking." However, on the Model 2236DW, blinking normal intensity and blinking high intensity characters both appear as blinking, high intensity.

## Special Uses of Alternate Display Attributes

### 1. LIST D

The CPU sends out a HEX(OE) at the beginning of each REM% statement in the program. Thus, comment statements appear in the most recently selected alternate display attribute.

### 2. 100 PRINT "PROMPT";: LINPUT HEX(OE), A\$: PRINT A\$

The field to be entered appears in the most recently selected alternate display attribute. When entry is terminated with a carriage return, the alternate attribute is cancelled, so the PRINT statement prints A\$ in normal intensity.

### 3. 150 PRINT HEX(OE); "PROMPT"; HEX(OF);

160 LINPUT A\$

This time, only the prompt appears in the most recently selected alternate attribute.

## Summary of Display Attribute Rules

The following list contains the general rules for governing the use of display attributes.

1. HEX(02 04 xx yy OE) selects and activates a display attribute. Attributes activated in this manner are turned off only by HEX(OF) or by another HEX(0204... sequence. The attribute is not turned off by carriage return, HEX(OD). Thus, it is possible to highlight a portion of either one or several lines.
2. HEX(02 04 xx yy OF) selects, but does not activate, a display attribute. Normal intensity is activated instead.
3. An isolated HEX(OE) activates the attribute selected by the last HEX(0204... sequence for a maximum of one text line. The attribute remains in effect until the occurrence of either an automatic carriage return, a programmed HEX(OD), or a HEX(OF).
4. Rule 1 takes precedence over Rule 3. If an attribute is selected and activated by Rule 1, a subsequent HEX(OE) will not cause the attribute to be turned off by the next carriage return.

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5. An isolated HEX(OF) always turns off the alternate attribute and restores normal intensity.
6. Screen clear, HEX(03), clears the screen to black, but otherwise has no effect on the meaning of HEX(OE) or the attribute currently in effect. Likewise, scrolling the screen scrolls in a black line, but otherwise has no effect on attributes.
7. Programmers are reminded that reverse video spaces are white, not black. Zoned format PRINT statements, i.e., PRINT, PRINT TAB, and the third parameter of PRINT AT, use spaces to clear the screen. These statements will leave white areas on the screen when reverse video is activated.
8. Terminal power on and the RESET key cause normal intensity characters to be selected and the meaning of HEX(OE) to be defined as high intensity.
9. The system considers all codes HEX(00) to HEX(OF) to occupy no space on the output medium. Thus, attribute selection sequences do not cause the system to issue automatic carriage returns or throw off the column count used by TAB and zoned format PRINT statements.
10. Control codes HEX(00) to HEX(OF) do not have attributes. It is not possible to change the attribute of a character by passing the cursor through it with a PRINT AT statement.
11. The meaning of isolated HEX(OE) is maintained by the terminal, not the partition. If a program gives up control of the CRT with \$RELEASE TERMINAL, there is a good chance that a program in another partition will change the meaning of HEX(OE) in the course of using attributes.

## SELECTION OF CHARACTER SETS

The Model 2236DW actually offers two character sets: the normal character set (refer to Figure 2) and the alternate character set (refer to Figure 3). The following sequence is used for selecting either character set.

HEX (02 02 xx 0F)

where:

02 02 = The control code sequence which indicates to the terminal that a character set will be selected.

xx = A HEX code specifying the character set to be selected.

If xx = 00 The normal character set is selected. The codes HEX(90) to HEX(F $\bar{F}$ ) are underline versions of characters from HEX(10) to HEX(7 $\bar{F}$ ).

If xx = 02 The alternate character set is selected. The codes HEX(80) to HEX(F $\bar{F}$ ) represent the graphic characters and symbols.

0F = A terminator character that signals the end of the character selection sequence.

Programmers are reminded that any character of either character set can be underlined by using the underline character attribute. Either character set may differ on foreign language versions of the terminal. All versions of the terminal are capable of producing uppercase alphabet, numbers, and most of the special characters used in BASIC programming.

In the character set selection, the following items should be noted.

1. In the alternate character set, the codes HEX(9C) to HEX(B $\bar{F}$ ) are presently undefined and reserved for future expansion. Any use of these codes involves the risk of being incompatible with future use of the terminal.

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2. With the exception of the following HEX codes, the character sets of both the 2236DE and the 2236DW terminals are identical. The following HEX code values have been redefined for the normal character set of the 2236DW terminal.

<u>HEX</u>	<u>2236DW Normal Character Set</u>	<u>2236DE Normal Character Set</u>
5F	down arrow	left arrow
7B	up/down arrow	section symbol
80	dotted space	blank
8D	left arrow	up/down arrow
8F	page character	paragraph symbol
DF	underlined down arrow	underlined left arrow
FB	underlined up/down arrow	underlined section symbol

3. The following Hex code values have been redefined for the alternate character set of the 2236DW terminal.

<u>HEX</u>	<u>2236DW Alternate Character Set</u>	<u>2236DE Alternate Character Set</u>
5F	down arrow	left arrow
7B	up/down arrow	section symbol

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		High-order HEX Digit														
		1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Low-order HEX Digit	0	â	Space	0	@	P	°	p	.	â	_	0	@	P	°	p
	1	ê	!	1	A	Q	a	q	◆	ê	!	1	A	Q	a	q
	2	î	"	2	B	R	b	r	▶	î	"	2	B	R	b	r
	3	ô	#	3	C	S	c	s	◀	ô	#	3	C	S	c	s
	4	û	\$	4	D	T	d	t	→	û	\$	4	D	T	d	t
	5	ä	%	5	E	U	e	u	└	ä	%	5	E	U	e	u
	6	ë	&	6	F	V	f	v		ë	&	6	F	V	f	v
	7	ï	'	7	G	W	g	w	..	ï	'	7	G	W	g	w
	8	ö	(	8	H	X	h	x	'	ö	(	8	H	X	h	x
	9	ü	)	9	I	Y	i	y	'	ü	)	9	I	Y	i	y
	A	à	*	:	J	Z	j	z	^	à	*	:	J	Z	j	z
	B	è	+	;	K	[	k	†	■	è	+	;	K	[	k	†
	C	ù	,	<	L	\	l	£	!!	ù	,	<	L	\	l	£
	D	Ä	-	=	M	]	m	é	—	Ä	-	=	M	]	m	é
	E	Ö	.	>	N	↑	n	ç	ß	Ö	.	>	N	↑	n	ç
	F	Ü	/	?	O	↓	o	€	┘	Ü	/	?	O	↓	o	€

Figure 2. The Normal Character Set of the 2236DW Terminal

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		High-order HEX Digit														
		1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Low-order HEX Digit	0	â	Space	0	@	P	°	p	•	•						
	1	ê	!	1	A	Q	a	q	◆	◇						
	2	î	"	2	B	R	b	r	▶	▲						
	3	ô	#	3	C	S	c	s	◀	▼						
	4	û	\$	4	D	T	d	t	→	↓						
	5	ä	%	5	E	U	e	u	└	┘						
	6	ë	&	6	F	V	f	v		√						
	7	ï	'	7	G	W	g	w	¨	°						
	8	ö	(	8	H	X	h	x	'	{						
	9	ü	)	9	I	Y	i	y	'	}						
	A	à	•	:	J	Z	j	z	^	Δ						
	B	è	+	;	K	[	k	]	■	□						
	C	ù	,	<	L	\	l	£	!!							
	D	Ä	-	=	M	]	m	é	↑							
	E	Ö	•	>	N	↑	n	ç	ß							
	F	Ü	/	?	O	↓	o	€	†							

Figure 3. The Alternate Character Set of the 2236DW Terminal

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The 64 graphic characters, HEX(C0) to HEX(FF), are represented by all the combinations of sixths of a character space, where the character space is divided as shown in Figure 4. When displayed, graphic characters are extrapolated to fill the entire character position. For this reason, adjacent areas of two graphic characters will touch; thus, continuous lines (bars) of light or dark areas can be displayed on the screen. When combined with display attributes, character graphics are useful for the construction of bar graphs, histograms, and other special displays.

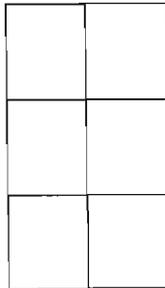


Figure 4. Division of a Character Space

The HEX codes for each specific graphic design are determined in the following manner. Use HEX(C0) as the base, with each different segment (each sixth of a character space) equal to the following HEX values.

01	02
04	08
10	20

Suppose the design  was desired. To obtain the appropriate HEX value add desired segments to the base. For example:

C0	→	Base
01	}	Desired segments
02		
+ 04		
C7	→	Resulting HEX code for desired design

Therefore, the design  would be coded as HEX(C7). For a quick and easy reference, programmers should also refer to Figure 3, The Alternate Character Set of the 2236DW Terminal.

## Examples of the Character Sets

```
PRINT HEX(02 02 00 0F); HEX(C6 C5 C2 D2 D5 C1 D2 D9)
```

This statement selects codes HEX(90) to HEX(FF) to represent normal characters HEX(10) to HEX(7F) with underline. Thus, the screen would display the word FEBRUARY with an underline.

```
PRINT HEX(02 02 02 0F); HEX(FF FC F0);
```

This statement selects the alternate character set and displays three character boxes of decreasing heights (  ). These are the characters most useful for constructing vertical bar graphs.

## Summary of Character Set Selection

The rules concerning the use of character set selection can be summarized as follows.

1. HEX(02 02 00 0F) selects the normal character set. The meaning of codes HEX(90) to HEX(FF) are defined to be the normal characters HEX(10) to HEX(7F) with underline.
2. HEX(02 02 02 0F) selects the alternate character set. The codes HEX(80) to HEX(FF) represent the graphic characters and other special symbols.
3. Power on and RESET select the default character set (the normal character set for the standard USA Model 2236DW).
4. Carriage return does not affect character set selection. The sequences given in Rules 1 to 3 are the only methods for changing character sets.
5. As with attributes, the character set selection sequences affect the interpretation of characters at the time they are received by the terminal. Therefore, underlined and graphic characters may be used in different areas of the same display. Once on the screen, a character is modified only by explicitly striking over it with another character or by screen clear.
6. All display attributes can be used with both the normal and the alternate character set.

## PRINT BOX FUNCTION

### General Form:

BOX (height, width)

### where:

height = Expression specifying the height of the box; each unit is the height of a character space.

width = Expression specifying the width of the box; each unit is the width of a character space.

### Purpose:

The BOX function is used within a PRINT statement to draw or erase a box or line on a CRT which has box graphics capability. The first expression specifies the height of the box; the second is the width of the box. The sign of the arguments determines whether lines are drawn or erased. If the signs are nonnegative, lines are drawn; negative signs cause lines to be erased. If the box height is zero, a horizontal line is drawn or erased. A width of zero causes a vertical line to be drawn or erased. The BOX function positions the box so that the upper-left corner is at the current cursor position. Drawing a box does not move the CRT cursor.

### Examples:

PRINT BOX (3, 4);	-- Draws a 3 x 4 box
PRINT BOX (-3, -4);	-- Erases a 3 x 4 box
PRINT BOX (0, X);	-- Draws a horizontal line X units long
PRINT BOX (-7, 0);	-- Erases a vertical line 7 units long
PRINT AT (5, 10); BOX (1, 6); "TITLE"	-- Displays TITLE enclosed in a box

Note that in order to include the field TITLE in the last example, the box had to be one character wider than the length of the field, and the left edge of the box had to be one character position to the left of the field to be enclosed. Therefore, to box a field in general, use the statement:

```
PRINT BOX (1, LEN(A$)+1); "▯"; A$
```

where A\$ is the given field, LEN(A\$) is the length of the field A\$, and the symbol ▯ represents one space.

Box graphics can also be used for highlighting entry fields as shown in the following example.

```
CLEAR  
10 PRINT "PROMPT"; BOX(1, 17);:LINPUT A$  
RUN
```

## Box Graphics

The 2236DW Integrated Terminal can display continuous horizontal or vertical lines, enabling forms to be drawn or information to be separated by lines or boxes. The horizontal line unit is a line segment the width of a character space, but positioned from the middle of one character space to the middle of the next character space. Horizontal lines are displayed between rows of characters.

The vertical line unit has the height of a character space. Vertical lines are drawn through the middle of a character space; the line coexists with the character at that location. (Note that since the height and width of a character space are not the same unit measurement, boxes are not drawn proportionally. However, because of these measurements, a programmer can easily box fields of characters.)

Figures 5 and 6 illustrate the placement of box graphic lines. Figure 5, which shows the smallest possible box, was produced by the statement PRINT BOX(1,1); "AB". It illustrates the placement of horizontal and vertical box graphic lines relative to the character position. Figure 6, which was produced by the statement PRINT BOX(1,1); HEX(0202020F); HEX(E1CC), demonstrates where box graphic lines appear relative to character set graphic blobs.

The terminal allows the programmer to consider the CRT as both a box graphics display and a character display that just happen to be displayed on the same screen. While in Character mode, only the characters and their attributes are modified while box graphics remain intact. 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. The one exception to this rule is screen clear, HEX(03) which clears both characters and box graphics. During a box graphics sequence, characters and their attributes are undisturbed.

Because the Character and Box Graphic modes are independent, it is easy to update portions of either display. The third argument of PRINT AT is useful for clearing portions of the display. Though slower than screen clear, the statement PRINT AT (0,0,) is useful for clearing the characters from the screen without disturbing the box graphics.

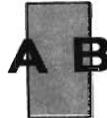


Figure 5. Box Graphic Line Placement Relative to Character Position

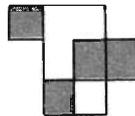


Figure 6. Box Graphic Line Placement Relative to Graphic Character Set

# PRODUCT BULLETIN

# NO.190

## MODEL 2236DW TERMINAL SPECIFICATIONS

### Size

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

### Weight

41.0 lb (18.6 kg)

### CRT

Display Size . . . . .	12 in. diagonal (30.5 cm)
Capacity . . . . .	24 lines, 80 characters/line
Character Height . . . . .	0.16 in. (0.41 cm)
Character 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, reverse video, blinking, 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.

### Keyboard

Typewriter keyboard which can generate 88 different ASCII characters, including uppercase and lowercase letters, numbers, and symbols. Also included are a numeric keypad, several Program Control keys, and 18 program-definable Special Function keys: 16 numbered keys along the top of the keyboard, and the TAB and GL keys located in the alphanumeric keyboard zone. Each Special Function key can be used with the SHIFT key for a total of 36 Special Function keys. The keyboard also contains Editing keys (INSERT and DELETE), Location keys (NEXT SCRNL and PREV SCRNL), and Cursor Control keys (controls movement of cursor in indicated direction -- up, down, right, and left).

### Operating Environment

#### Temperature

50°F to 90°F (10°C to 32°C)

#### Relative Humidity

35% to 65% noncondensing (recommended)

20% to 80% noncondensing (allowable)

## Power Requirements

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

## Fuses

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

## Communication Mode

Asynchronous, full-duplex

## Transmission Rates

Manually selectable for each terminal at 300, 600, 1200, 2400, 9600, or 19.2K baud

## Character Format

When communicating with a 2200MVP, LVP, SVP, or VP system:

1 start bit, 1 stop bit

8 data bits, plus odd parity (11 bits/character)

Other selectable character formats:

8 data bits, no parity

7 data bits, odd parity

7 data bits, even parity (10 bits/character)

# PRODUCT BULLETIN

# NO.190

## Terminal/CPU Cable

One 8-ft (2.4-m) cable to power source. One 25-ft (7.6-m) direct connection cable is provided with each Model 2236DW, unless an optional direct connection cable is ordered for a terminal. Nonextendable cables are available optionally for direct connection up to 2000 ft (606.1 m). Refer to Table 2.

Table 2. Direct Connection Cables

Length in Feet	Length in Meters	Part Number
25	7.6	120-2236-25
50	15.2	120-2236-50
100	30.3	120-2236-1
200	60.6	120-2236-2
300	90.9	120-2236-3
400	121.5	120-2236-4
500	151.5	120-2236-5
600	181.8	120-2236-6
700	212.1	120-2236-7
800	242.4	120-2236-8
900	272.7	120-2236-9
1000	303.0	120-2236-10
1250	378.8	120-2236-11
1500	454.5	120-2236-12
1750	530.3	120-2236-13
2000	606.1	120-2236-14

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). (Refer to Table 3) Combined cable distance however, from Wang equipment to a modem is 50 ft (15.2 m) maximum according to Electronics Industries Association (EIA) standards.

Table 3. Modem Cables

Length in Feet	Length in Meters	Part Number
12	3.7	120-2227-12
25	7.6	220-0219
50	15.2	220-0220

## 2236DW Integrated Terminal Product Statistics

Model Number: 2236DW  
Part Number: 177-3249  
Release Date: February 2, 1981  
Availability: March 2, 1981  
Classification: Electrical  
Warranty: Standard  
Commission: 5%

# BULLETIN



LABORATORIES, INC.

DATE: 7/31/81 ADMINISTRATIVE \_\_\_\_\_ TECHNICAL X NUMBER 165  
 ORIGINATOR: Steve Scott REVIEWED BY: Earle Keizer  
 DISTRIBUTION: ATS X DTS X DM \_\_\_\_\_ ATOM X  
 ALL OFFICES X HOME OFFICE X EACH EMPLOYEE \_\_\_\_\_  
 SUBJECT: Word Processing on 2200 Systems PAGE 1 OF 1

The recent introduction of Word Processing on the 2200 Systems has prompted some unique problems. Known bugs include:

1. Glossary doesn't work at all.
2. If you are not using a TSF with a printer, the TOF function will not work properly.

We will be receiving a new prom update. The new 25 proms will help this problem. As well as the prom change on the 7792, we will also receive a new copy of the W.P. software to help clean up any of the miscellaneous problems.

If you find any other major problems with this software, please let me know and I will include it in an update.

IV.C.2.

TSF

2236DW

2200 WORD PROCESSING SOFTWARE

Wang's 2200 Word Processing Software is NOT an Operating system package, but rather it is an Application package which the customer purchases through normal marketing channels and installs on his own 2200 system. Customer Engineering personnel are not required to support the WP software and should refer any customer inquiries to the local Wang Software Analyst.

This software package functions similiar to the Wang's Office Information System (OIS) software and has the same menus as the OIS WP. The package is diskette type (Three Diskettes) or double-sided double density diskette type (one Diskette). This package requires a minimum of 28 (twenty-eight) kBytes of user's memory.

The software is installed on the 2200 disk system by selecting the drive where the software diskette resides, then loading "WPINSTLL". A menu will be displayed which requires response to questions such as date, time, destination disk, address, etc. In the event the destination disk does not have sufficient space to accommodate the software (approximately 3000 sectors), the installation procedure will fail. Once the blanks in the menus are filled in, executing the menu will initiate the transfer of software to the destination disk and the operator prompted to remove/load other diskettes as the case may be.

Following the installation on the system disk, the program "WPSUPER" must be loaded and run whereby the Supervisory menu is displayed for the selection of WP defaults. Here the operator creates Volumes which will contain Libraries in which WP documents will reside.

The Disk Assignment option must be selected first to designate the WP address on the disk system. The next option selected should be the Volume Maintenance menu where a volume name, address, and size are specified, pass word is optional. Finally, the Library Maintenance option will be selected to designate libraries, from "A" through "Z" and "a" through "z", on the volumes created already. Other selections enable the assignment of certain terminals as WP only on certain libraries and designate certain printers as WP printers.

HARDWARE REQUIREMENTS

Before the software can be installed, it is essential that the supervisor ensure that his or her 2200 system, as configured, meets the following basic hardware requirements:

1. A Wang 2200 VP series CPU with a minimum of 32K user memory
2. A 2236DW integrated terminal to run 2200 Word Processing Software.
3. One megabyte of system disk storage to receive 2200 Word Processing Software.
4. A 28K memory partition for each 2236DW terminal

2200 Word Processing software can be run on a 2260 or 2280 Fixed/Removable disk drive, the Winchester-style fixed disk, or the double-sided, double-density diskette.

2236DW

The RESET, ERASE, & HALT keys can only be used with the 36DW in uppercase.  
Thanks to Dave Thibeault for that info.

Except for the information on the MUX D Board, the following data on this page appears in District Newsletter #4.

Installations where 2200 systems were manufactured prior to March 81, which are upgrading for 2200 word processing using the 2236DW intergrated terminal, must update the firmware on the terminal controller boards as follows:

Board 210-7591 - A MXD PROMS (MUX D BRD)

L32 - 378-2140 R07  
L17 - 378-2141 R07  
L16 - 378-2142 R07  
L15 - 378-2143 R07

Board 210-7516 - A PROMS (2200 Triple controller daughter board)

378-4092 R1  
378-4093 R1

Board 210-7789 - PROMS (SVP Terminal & Printer Controller Board)

L44 - 378-4092 R1  
L43 - 378-4093 R1

Board 22C32 Triple Controller,  
210-7816A - PROMS (New style 2200 Triple controller daughter Board.)

- 378-2591 R1  
- 378-2450 R1  
- 378-2449 R1  
- 378-2451 R1

Operating the 2236DW terminal without the above changes will result in spurious Special Functions. The above changes are compatible with 2236DE.

#### 1.5.4 Error Codes

Table 1-3 lists some possible errors that result when using the document access subroutines. The error codes are returned in the variable B1\$.

Table 1-3. Error Codes

<u>Hex Error Code</u>	<u>Description</u>
01	Volume Full
02	File or Volume already exists
03	File or Volume does not exist
04	No free device slots
05	Incorrect password
06	Open access type error - (File is open by another user, or was previously opened by this user)
07	File not open
08	Illegal File ID
09	Not enough room in file (to reuse scratched file)
10	File mess up
20	EOF reached unexpected (fatal)
22	Destination VAU not valid
23	Buffer variables not valid
24	No VAU's in file
25	Source & VAU # inconsistent
26	Volume init parameter inconsistent
27	Byte parameter error in replace
28	EOF reached normal (not fatal)
29	Data transfer with greater than 128 VAU's
A1	Page table full
A2	Last page cannot be deleted
A3	Page does not exist
A4	User defined slot number already assigned
A5	Illegal file name
A6	Library map not found on the selected disk
A7	Library has not been established
A8	Illegal page number
A9	Prototype doesn't exist
B0	Prototype not accessible
B1	Glossary not attached
B2	Glossary not verified
B3	Glossary index exceeds one sector
B4	Glossary entry not found
B5	Wrong numeric type for admin

<u>Numeric Error Code</u>	<u>Description</u>
80 through 89	Disk errors (refer to BASIC-2 manual)
90 through 99	I/O errors (refer to BASIC-2 manual)

\*\* HEX(00) Normal, successful return  
1-18

STOP 5070 KNOWN BUG, PROBLEM WITH POINTERS MESS'ED UP

## 2200

### WORD PROCESSING ON THE 2200

There are some known bugs with Word Processing on 2200 which include:

1. Glossary does not work at all
2. If you are not using a TSF with the daisy, the top of form function will not work properly

New proms, R5, will be coming out along with a 7792 board. WP software is also being revised to help correct these problems.

If you know of any other problems, please let the Distict Staff know.

The following is a list of error codes for WP on 2200.

### ERROR CODES

#### HEX ERROR CODE

#### DESCRIPTION

01	Volume Full
02	File or Volume already exists
03	File or Volume does not exist
04	No free device slots
05	Incorrect password
06	Open access type error
07	File not open
08	Illegal file ID
09	Not enough room in File(to reuse scratched file)
10	File mess up
20	EDF reached unexpected (fatal)
22	Destination VAU not valid
23	Buffer variables not valid
24	No VAUS in file
25	Source & VAU # inconsistent
26	Volume unit parameter inconsistent
27	Byte parameter error in replace
28	EOF reached normal (not fatal)
29	Data transfer with greater than 128 VAUs

#### Number Error Code

#### Description

80 thru 89	Disk errors (refer to BASIC-2 ref manual)
90-99	I/O errors(refer to BASIC-2 ref manual)

## 2236DW WORKSTATION

The following is a list of some of the differences between the new 2236DW and the 2236DE Terminal:

## PART NUMBER:

2236DW_ITEM	PART NUMBER
Keyboard	725-2637
Keyboard Faceplate	452-2401-XA
Logic PCB	210-7592-10A
L16 Prom	378-3067
(378-3067 comes with the 210-7592-1A)	

## HEX\_CODES:

HEX_	DW_NORMAL_CHARACTERS_SET	DE_NORMAL_CHARACTERS_SET
5F	down arrow	left arrow
7F	up/down arrow	section symbol
80	dotted space	black
8D	left arrow	up/down arrow
8F	page character	paragraph symbol
DF	underlined down arrow	underlined left arrow
FF	underlined up/down arrow	underlined section symbol

HEX	DW_ALTERNATE_CHARACTERS_SET	DE_ALTERNATE_CHARACTERS_SET
5F	down arrow	left arrow
7B	up/down arrow	section symbol

## 2236DW\_WORKSTATION

## SELECTION\_OF\_CHARACTER\_SETS

The Model 2236DW actually offers two character sets, the normal character set and the alternate character set. The following sequence is used for selecting either character set:

HEX ( 02 02 xx 0F )

where:

02 02	=	THE Control code sequence which indicates to the terminal that a character set will be selected.
xx	=	A HEX code specifying the character set to be selected.  If xx=00-The normal character set is selected. The codes HEX(90) to HEX(FF) are underlined versions of characters from HEX (10) to HEX (7F)  If xx=02-The alternate character set is selected. The codes HEX (80) to HEX (FF) represent the graphic characters and symbols
0F	=	A terminator character that signals the end of the character selection sequence.

**NOTE:** The game Martians uses an incorrect sequence for accessing the alternate character set. Unless this is corrected, the program will not run. The incorrect sequence appears as follows:

HEX (02 02 02 xx 0F)



LABORATORIES, INC.

2200

2236DW

TOPIC: 2236 "DE" AND "DW" LOGIC BOARDS

The part numbers for the 2236DE and the 2236DW logic boards are very similar. However, these boards are not interchangeable. The part numbers are:

210-7592-A  
210-7592-1A

2236 DE Logic Board  
2236 DW Logic Board

COMPATIBILITY WITH 2281W

To run WP Software with a DW terminal on a 2281W a 210-7309 with R4 proms must be in the 81W. However, this will create a problem possibly where a reverse form feed will be done when reset is keyed from a terminal. Engineering is supposedly working on this latter problem.

## 2236\_DW\_WORKSTATION

## TERMINAL/CEU\_INTERFACE

Each 2236DW Intergrated Terminal is connected to either a 2236MXD Terminal Processor or a 22C32 Triple Controller when configured with a 2200 MVP, LVP, or VP Central Processing Unit. Existing controllers must be revised to current standards to support the 2236DW terminal as follows:

- A. Change the two PROM's on PCB 210-7516-A (2200 Triple Controller Daughter brd.)

EROM	IQ
378-4092	378-4092-R1
378-4093	378-4093-R1

- B. Change the two PROM's on PCB 210-7789-A (SVP Term & Printer Controller)

EROM	IQ
378-4092	378-4092-R1
378-4093	378-4093-R1

- C. Change the four PROM's on PCB 210-7816-A (New Style 2200 Triple controller daughter brd.)

EROM	IQ
378-2591	378-2591-R1
378-2449	378-2449-R1
378-2450	378-2450-R1
378-2451	378-2451-R1

CUSTOMER ENGINEERING  
TECHNICAL ASSISTANCE CENTER  
NEWSLETTER

#10811

IV.B.1

2200 SYSTEMS-INTERFACE-I/O CONTROLLERS.

TOPIC: UPDATING TERMINAL CONTROLLER BOARDS FOR THE 2236DW.

TO ALL NORTH AMERICAN FSC'S

Installations where 2200 systems manufactured prior to March 81, which are upgrading for 2200 word processing using the 2236DW intergrated terminal, must update the firmware on the terminal controller boards as follows:

Board 210-7591 - A MXD PROMS

L32 - 378-2140 R07  
L17 - 378-2141 R07  
L16 - 378-2142 R07  
L15 - 378-2143 R07

Board 210-7516 - A PROMS

378-4092 R1  
378-4093 R1

Board 210-7789 - PROMS

L44 - 378-4092 R1  
L43 - 378-4093 R1

Board 22C32 Triple Controller,  
210-7816A - PROMS

- 378-2591 R1  
- 378-2450 R1  
- 378-2449 R1  
- 378-2451 R1

Operating the 2236DW terminal without the above changes will result in spurious Special Functions. The above changes are compatible with 2236DE.

**WANG**

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NEWSLETTER

#10407

III.D.1

PERIPHERALS-TERMINALS, WORKSTATION DISPLAYS, KEYBOARDS-FOR 2200.

IDPIC:..STATUS\_OF\_2236DW\_TERMINAL

Shipment: Began week ending 3/27/81 in North America (Phoenix, Los Angeles, Milwaukee, Houston, Providence and Burlington, MA) using modified logic PCB 210-7592. Order P/N 210-7592-1 for DW application.

Keyboard: Available in Home Office Stockroom, P/N 725-2637. Before installation check the bottom of keyboard for a shorting tape, remove tape before installation.

Diagnostics: Under evaluation and will be released shortly.

Software: WP software package is in process of being released. Customer Engineering personnel are not required to support the WP software package. Refer all inquiries about WP software to local Wang analyst.

Documentation: Preliminary copies have been sent to ATOMS. Will be available in quantities approximately middle of May 1981.

New PCB 210-7792: In process and will replace PCB 210-7592-1.

CUSTOMER ENGINEERING  
TECHNICAL ASSISTANCE CENTER  
NEWSLETTER

#10804

IV.C.3

2200 SYSTEMS-SOFTWARE-UTILITIES/TELECOM INFO.

TOPIC: 2200 WORD PROCESSING (Continued)

II. 2200 WORD PROCESSING SOFTWARE

Wang's 2200 Word Processing Software is NOT an Operating system package; rather it is an Application package which the customer purchases through normal marketing channels and installs on his own 2200 system. Customer Engineering personnel are not required to support the WP software and should refer any customer's inquiries to the local Wang software analyst.

The following brief information about the 2200 Word Processing software is included here for your information. This software package functions similar to the Wang's Office Information System (OIS) software and has the same menus as the OIS WP. The package is released on flexible diskettes in either single-sided single-density diskette type (three diskettes) or double-sided double-density diskettes type (one diskette). This package requires a minimum of 28 (twenty-eight) kBytes of user's memory.

The software is installed on the 2200 disk system by selecting the drive where the software diskette resides, then loading "WPINSTLL". A menu will be displayed which requires response to questions such as date, time, destination disk, address, etc. In the event the destination disk does not have sufficient space to accommodate the software (approximately 3000 sectors), the installation procedure will fail. Once the blanks in the menus are filled-in, executing the menu will initiate the transfer of software to the destination disk and the operator prompted to remove/load other diskettes as the case may be.

Following the installation on the system disk, the program "WPSUPER" must be loaded and run whereby the Supervisory menu is displayed for the selection of WP defaults. Here the operator creates Volumes which will contain Libraries in which WP documents will reside.

The Disk Assignment option must be selected first to designate the WP address on the disk system. The next option selected should be the Volume Maintenance menu where a volume name, address and size are specified; pass word is optional. Finally the Library Maintenance option will be selected to designate libraries, from "A" through "Z" and "a" through "z", on the volumes created already. Other selections enable the assignment of certain terminals as WP only on certain libraries and designate certain printers as WP printers.

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NEWSLETTER

#10804

IV.C.3

2200 SYSTEMS-SOFTWARE-UTILITIES/TELECOM INFO.

TOPIC: 2200 WORD PROCESSING (Continued)

III. LOADING 2200 WORD PROCESSING SOFTWARE

INTRODUCTION

Once a 2200 series computer system has been assembled, powered up, and configured (usually by the person who installs the system), it is ready to receive 2200 Word Processing Software. This chapter will explain the steps necessary to transfer the software to the system disk.

HARDWARE REQUIREMENTS

Before the software can be installed, it is essential that the supervisor ensure that his or her 2200 system, as configured, meets the following basic hardware requirements:

1. A Wang 2200 VP series CPU with a minimum of 32K user memory.
2. A 2236DW integrated terminal to run 200 Word Processing Software.
3. One megabyte of system disk storage to receive 2200 Word Processing software.
4. A 28K memory partition for each 2236DW terminal.

2200 Word Processing Software can be run on a 2260 or 2280 Fixed/Removable disk drive, the Winchester-style fixed disk, or the double-sided, double-density diskette.

CUSTOMER ENGINEERING  
TECHNICAL ASSISTANCE CENTER  
NEWSLETTER

#10908

IV.A.3

2200 SYSTEMS-MAINFRAMES-VP, MVP, LVP CPU'S.

TOPIC: NECESSARY UPDATES TO RUN 2200WP

2236DW

PC card must be a 210-7592-1A

Proms in 210-7592-1A must be:

3067  
~~378-2446-R2~~ L16  
378-4094-R2 L18  
378-4095-R2 L17

Keyboard must be a 725-2637

2236MXD

Proms must be: 378-2140-R7

378-2141-R7

378-2142-R7

378-2143-R7

22C32 Triple Controller (with 210-7816 daughter board)

Proms must be: 378-2591-R1

378-2449-R1

378-2450-R1

378-2451-R1

SVP Terminal-Printer Controller (210-7789), and

22C32 Triple Controller (with 210-7516 daughter board)

Proms must be: 378-4092-R1

378-4093-R1

2281W Printer

210-7309 PC card proms must be: 378-2554-R5

378-2555-R5

378-2556-R5

378-2557-R5

378-2558-R5

378-2559-R5

378-2590-R5

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NEWSLETTER

#11006

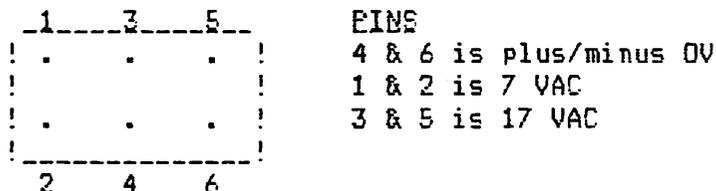
III.D.1

PERIPHERALS-TERMINALS, WORKSTATION DISPLAYS, KEYBOARDS-FOR 2200.

TOPIC: PROBLEMS THAT MIGHT BE ENCOUNTERED WITH THE 2236DE/DW  
CHASSIS

The number of 2236DE/DW chassis (270-0576) ordered in the past six months are too high for this type of part. To assure the chassis is the problem, we must test it first, then if you suspect a problem with it, here are the steps to take:

1. Check the AC power input to the 210-7592 board (J3).



Use pins 4 or 6 of J3 for the DVM voltage return. If the AC voltage is at J3, then most likely, there is no problem with the chassis.

2. Check the 12V going to the monitor (220-1136 cable at the top left hand side of the board). If there is no voltage, disconnect the cable and check again. The monitor can pull down the 12 VDC and short out the power supply.
3. If the terminal blows fuses, disconnect J3 from the 210-7592 board and try again. If it blows a fuse again, then the problem is in the chassis.
4. Some terminals have a 110/220 switch beside the transformer, be certain that the switch is in the proper position for the incoming line voltage.

If these steps are followed, we should see a reduction in the number of 2236DE/DW chassis ordered by the field.

2236 MXD - If you are experiencing problems with terminals plugged into port 2, check the port 2 connector for a floating ground. Pin 1 is ch gnd and pin 7 is 10 volts, same as other 3 ports.

2236 D/DE Cables - Another cause for intermittent problems is that an unknown quantity of cables were shipped without the cable shield connected to ground on one end of cable. Check both ends of cable make sure shield is connected to either pin 1 of plug or to connector case.

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