WANG LABORATORIES, INC.
836 NORTH STREET, TEWKSBURY, MASSACHUSETTS 01876, TEL. (617) 851-4111, TWX 710 343-6769, TELEX 94-7421

DATA SHEET

The System 2200T CPU (Central Processor Unit) is a powerful, sophisticated, multi-faceted system base.

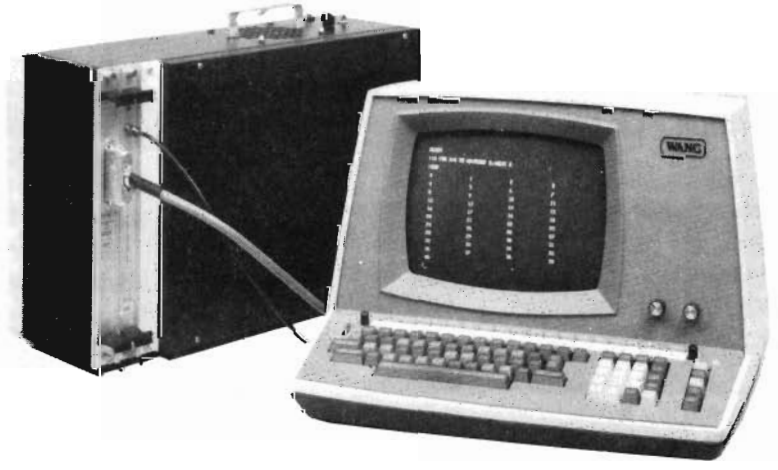
The standard System 2200T contains 4,096 (4K) bytes of Random Access Memory (RAM), expandable in 4K or 8K modules to a maximum of 32K bytes, and three I/O slots. A powerful 42.5K Extended BASIC Interpreter is resident in a separate Read Only Memory (ROM) area of the CPU; nearly the entire RAM is available to the user for programming (only 700 bytes are reserved for system use). By "hardwiring" the interpreter, the time and necessity of 'paging' the system in and out of user memory is eliminated. In this way, the 2200T CPU favorably compares to a large computer with a much greater memory.

The CPU, with its Extended BASIC Instruction Set, is capable of supporting all peripherals presently offered by Wang Laboratories, Inc. These peripherals include a Model 2226 Console-12" CRT and keyboard, for overall system control and operation including program data entry and display; a Model 2270 Removable Diskette Drive and a Model 2260 Fixed/Removable Disk Drive, for mass storage; and a 2221W Character Printer for report quality printed output. Numerous other peripherals also are available to custom configure a system to meet your particular needs.

For users with a need for a number of peripheral devices, Option 20 (6 I/O slots) and Option 20A (9 I/O slots) are available.

SOFTWARE

Wang Laboratories, Inc. provides an extensive software library which continually is being updated and expanded to meet the changing needs of the user. Some of the software contained in our library include: structural packages, statistical packages, and accounting packages.



2200T CPU (CENTRAL PROCESSOR UNIT)

2200T INSTRUCTION SET

General Basic Statements

ADD	GOTO	PLOT
AND	HEXPRINT	PRINT
BIN	% (IMAGE)	PRINTUSING
BOOL	IF END THEN	READ
COM	IF-THEN	REM
COM CLEAR	INIT	RESTORE
CONVERT	INPUT	RETURN
DATA	KEYIN	RETURN CLEAR
DEFFN	LET	ROTATE
DEFFN'	NEXT	SELECT
DIM	ON GOTO	STOP
END	ON GOSUB	TRACE
FOR	ON ERROR	UNPACK
GOSUB	OR	XOR
GOSUB'	PACK	

Disk Statements (all models)

Automatic File Cataloging Mode Statements

DATALOAD DC	LOAD DC
DATALOAD DC OPEN	MOVE
DATASAVE DC	MOVE END
DATASAVE DC CLOSE	SAVE DC
DATASAVE DC OPEN	SCRATCH
DBACKSPACE	SCRATCH DISK
DSKIP	VERIFY
LIST DC	

Basic Commands

CLEAR	HALT/STEP	RENUMBER
CONTINUE	LIST	RUN
		RESET

Absolute Sector Addressing Mode Statements

LIMITS	DATALOAD BA
LOAD DA	DATASAVE BA
SAVE DA	DATALOAD DA
COPY	DATASAVE DA

Tape Cassette Commands and Statements

BACKSPACE	LOAD
DATALOAD	REWIND
DATALOAD BT	SAVE
DATASAVE	SKIP
DATASAVE BT	

The character EDIT Instruction Set

The character EDIT feature provides greater editing flexibility. Individual alphanumeric characters in a line of program text resident in memory, or in data values of program text currently being entered from a keyboard, can be altered, inserted, or deleted, without retyping the entire line.

The SORT Instruction Set

MAT	CONVERT
MAT	COPY
MAT	MERGE
MAT	MOVE
MAT	SEARCH
MAT	SORT

The General I/O Instruction Set

$GIO	$PACK
$IF ON	$UNPACK
$TRAN	

Matrix Instruction Set

OPERATION	
MAT	addition
MAT	CON
MAT	equality
MAT	IDN
MAT	INPUT
MAT	INV,d
MAT	multiplication
MAT	PRINT
MAT	READ
MAT	REDIM
MAT	scalar multiplication
MAT	subtraction
MAT	TRN
MAT	ZER

MATHEMATICAL FUNCTIONS

Mathematical functions are calculated to 13 significant digits.

LOG – natural logarithm
ABS – absolute value
SQR – square root
RND – random number
INT – greatest integer function
SGN – assigns 1 if positive, 0 if zero, or –1 if negative.
PI (π) – (3.14159265359)
EXP – e^x
*SIN – sine
*COS – cosine
*TAN – tangent
*ARCSIN – arcsine
*ARCCOS – arccosine
*ARCTAN – arctangent

(*trig arguments: degrees, radians, or gradians)

ALPHANUMERIC FUNCTIONS

STR	POS
LEN	HEX
VAL	NUM

Arithmetic Operators:

↑ exponentiation
* multiplication
/ division
+ addition
- subtraction
= equal

Relational Symbols:

< less than
<= less than or equal to
> greater than
>= greater than or equal to
<> not equal

User Defined Special Function Keys

The 2200T CPU provides 32 Special Function Key operations which may be defined by the user through the keyboard and instantly redefined to meet changing requirements. The keys can be used to write, store, and then access, with a single keystroke, commonly used character strings for text entry; or the keys can provide program entry points directly from the keyboard.

OPTIONS AND PERIPHERALS

Memory

Additional 4,096 and 8,192 byte blocks. (Memory is available in 4K increments up to 16K, and in 8K increments from 16K to 32K.)

CPU/Keyboard/Display Options

Option 4	Audio Signal for 2216 & 2216A CRT
Option 20	Up to 6 I/O slots
Option 20A	Up to 9 I/O slots
Option 30	Upper/Lowercase for 2220 & 2226 CRT
Option 31	Audio Signal for 2220 & 2226 CRT
Option 32	Keyboard Clicker
Model 2290	CPU/Peripheral Stand

Keyboard/Display Peripherals

Model 2215	BASIC Keyword Keyboard
Model 2216	CRT Executive Display
Model 2216A	Upper/Lowercase CRT Display
Model 2216/2217	Combined CRT Executive Display/Single Tape Cassette Drive
Model 2216A/2217	Combined Upper/Lowercase CRT Display/Single Tape Cassette Drive
Model 2220	Console-CRT/Keyboard/Single Tape Cassette Drive
Model 2222	Alpha-Numeric Typewriter Keyboard
Model 2223	Alpha-Numeric/BASIC Keyword Keyboard
Model 2226	Console-12" CRT/Keyboard
Model 2292	Auxiliary Display w/25' cable

Output Peripherals

Model 2201	Output Writer
Model 2202	Plotting Output Writer
Model 2212	Analog Flatbed Plotter (10" x 15")
Model 2221	Line Printer (132 columns)
Model 2221W	Line Printer (132 columns)
Model 2231	Line Printer (80 columns)
Model 2232A	Digital Flatbed Plotter (31" x 48")
Model 2261	High Speed Printer (132 columns)
Model 2291	Digital Flatbed Plotter stand

Interface Controllers

Model 2207A	I/O Interface Controller (RS-232-C) Selectable BPS
Model 2227	Asynchronous Telecommunications Controller
Model 2227N	Null Modem for 2227
Model 2250	I/O Interface Controller (8 bit parallel)
Model 2252A	Scanning Input Interface Controller (BCD 1-10 digit parallel)

Input Peripherals

Model 2203	Punched Tape Reader
Model 2214	Mark Sense Card Reader
Model 2234A	Hopper-Feed Punched Card Reader
Model 2244A	Hopper-Feed Mark Sense/Punch Card Reader
Model 2262-1,2,3	Digitizer (Tablet sizes: 20" by 20", 30" by 40", 36" by 42")

Mass Storage Peripherals

Model 2209	Nine-Track Tape Drive
Model 2217	Single Tape Cassette Drive
Model 2218	Dual Tape Cassette Drive
Model 2224-2,3,4	Disk Multiplexer (for 2, 3, or 4 CPU's)
Model 2230-1,2,3	Fixed/Removable Disk Drive (1,228,800 to 5,013,504 bytes)
Model 2230MXA,B	Daisy-Chain-Type Disk Multiplexer (for 1, 2, 3 or 4 CPU's)
Model 2240-2	Dual Removable Flexible Disk Drive (524,288 bytes)
Model 2242	Single Removable Flexible Disk Drive (262,144 bytes)
Model 2243	Triple Removable Flexible Disk Drive (786,432 bytes)
Model 2260	Fixed/Removable Disk Drive (10,027,008 bytes)
Model 2270-1,2,3	Single, Double, or Triple Removable Diskette Drive (262,144 to 786,432 bytes)

DATA SHEET

SPECIFICATIONS

*Average Execution Time (Milliseconds)

Add/Subtract	0.8
Multiply	3.8
Divide	7.4
Square Root	46.4
e^x	25.3
$\log_e x$	23.2
X^{y^e}	45.4
Integer Value	0.24
Absolute Value	0.02
Sign	0.25
Sine	38.3
Cosine	38.9
Tangent	78.5
Arctangent	72.5
Read/Write Cycle	1.6 μ sec

*Average execution times determined using Random Number Arguments with 13 digits of precision. Speeds are generally faster in calculations with arguments of less precision.

Memory Size
4K - 32K (in increments of 4K or 8K)

Power Requirements
115 or 230 VAC ± 10%, 50 or 60 Hz ± ½ cycle

Wattage
220W

Fuse Size
3ASB @ 115V
1.5ASB @ 230V

Operating Environment
50°F to 90°F (10°C to 32°C)
20% to 80% relative humidity, Non-condensing

Subroutine Stacking
50

Size of 2200T CPU

Height	9.8 in. (24.8 cm)
Depth	21 in. (53.3 cm)
Width	14.5 in. (36.8 cm)

Weight
40 lb (18 kg)

ORDERING SPECIFICATIONS

A keyboard programmable Central Processing Unit (CPU) with hardwired Extended BASIC language. The CPU must have at least 4,096 bytes of memory, expandable in 4,096 and 8,192 increments to 32,588 bytes. The character EDIT mode, Disk Instruction Set, General I/O Instruction Set, SORT Instruction Set, and MATRIX Instruction Set must be standard features. The CPU must be capable of supporting all Wang Laboratories, Inc. peripherals and ancillary equipment presently available, and the following options: Option 4, Audio Signal for 2216 & 2216A CRT; Option 20, 6 I/O slots; Option 20A, 9 I/O slots; Option 30, Upper/Lowercase for 2220 & 2226 CRT; Option 31, Audio Signal for 2220 & 2226 CRT; and Option 32, Keyboard Clicker.

Wang Laboratories reserves the right to change specifications without prior notice.

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