Proposal For:

GEORGETOWN HARDWARE, INC.

by, WANG LABORATORIES, INC.

[This is a 1977-era bid for a Wang 2200 System,
both hardware and software, for Georgetown Hardware.

In the original, sections were set off by dividers,
but that has been approximated here by inserting blank
pages with the tag label on the page.

Except for the brochures, the bid was printed on single-
sided pages, and bound in a plastic binder.

Thanks to Ron O'Kelly for sharing this to give us all
some idea of what bid looked like.]

[INTRODUCTION]

WANG LABORATORIES, INC.

200 WEST THOMAS · SUITE 106 SEATTLE, WASHINGTON 98119 (206) 283-3800

June 9, 1977

Georgetown Hardware, Inc.
6201 13th South
Seattle, Washington 98108

Dear Mr. O'Kelly:

We would like to thank you for this opportunity to present our proposal for a computerized accounting system. We are pleased to recommend the Wang WCS/40 BASIC Accounting System as the solution to your data processing concerns. Growth of the WCS/40 is covered in the hardware section of this proposal.

This proposal results from a study of your accounting requirements by our systems people and a result of experience in designing similar software.

Installation of the Wang WCS/40 Accounting System will provide Georgetown Hardware with the working tools to meet the objectives defined. In addition, this system has the potential to expand in line with your growth projections for the business.

We are confident that the WCS/40 is the most cost-effective answer to your information processing needs. Phased installation of this system will be started within six to eight weeks after your approval. Your investment for hardware and software to meet your present requirements, including installation and training, is approximately $70,110 (please see pricing section) excluding the NCR 250 tape reader interface unit.

The proposed hardware includes: one 12" CRT "T.V." screen, with typewriter keyboard, a 20 million character dual disk, and a 240 line per minute printer. Interactive terminals can be added without any impact to the system software or hardware. It's just a matter of placing an order and within 4-5 weeks you have a new work station able to undertake any application chosen.

We propose that Empirical Research Group of Kent, Washington supply the NCR 250 tape cassette reader that attaches to our system via our 2207A interface. We anticipate that depending on your final needs, that the reader can supply the sales file transaction first thing in the morning or at any convenient time for the operator to handle the tape cassettes. The pricing for the tape reader is yet to be

determined, but will not exceed $3,000 and will be maintained by ERG.

The proposed hardware system includes a 90 day warranty. Maintenance would be $487.50 per month.

Sincerely,

WANG LABORATORIES, INC.

Charles H Kemp

Charles H. Kemp
Senior Sales Representative

[SOFTWARE]

SOFTWARE

Software to be provided by "The Office Manager." The proposed system hardware disk storage configuration is based on the following:

A. Accounts Payable:	*2000 Vendors* *100 Checks per month* *400-500 Warehouse line item per week* *100-150 Additional line items per week* *150-175 Invoices per month*
B. Accounts Receivable:	*1000 Permanent customers* *200-300 Miscellaneous customers* *100 Invoices per day* *4-5 Line items per invoice (average)* *45 Days to payment (average)* *500 Customer statements per month (average)*
C. General Ledger:	*125-150 Posting Accounts* *50-75 Journal entries per month*
D. Inventory:	*20,000-25,000 Items in warehouse* *3000-4000 Additional items* *Inventory receipts from warehouse once per week*
E. Payroll	*Currently 10 payroll checks issued; we understand it is not desired to have the system issure payroll checks, but the system is to maintain employee wage and deduction records for necessary Federal, State, and Insurance reporting.*

SYSTEM FLOW NARRATIVE

The normal processing day will begin with updating the master files of each module. Once it is ascertained that all master files of each module are correct, entry of the days transactions may begin. Accounts Receivable invoices and Cash Receipts, Accounts Payable invoices and Cash Disbursements, General Ledger Journal Entries, Inventory Receipts (and relieving of inventory other than cash sales), and the previous day's employee time cards may be entered, and all transactions processed. The captured cash sale transaction from the NCR-250 will be processed at the convenience of the operator. When all processing has been completed, the daily cycle will end with a backup procedure to provide maximum data security. Additional special procedures will be processed to do month, quarter, and year end reporting.

System Reports

All necessary CRT and printed reports as requested by Georgetown Hardware will be defined during the detailed design specification portion of the installation.

[HARDWARE]

HARDWARE

Proposed: *Please see the enclosed WCS/40 technical information brochure. Note that the proposed WCS/40 includes only one terminal. The enclosed hardware pricing quotation shows the price impact of adding terminals. Additionally, a model 2207A interface controller is included to interface the tape cassette reader.*

EASE OF USE

In the area of convenience, your Wang WCS/40 is unsurpassed. With the large, easy to read CRT for operator interaction and inquiry, and the silent operation of the typewriter keyboard, operator errors and distraction will never become a source of worry. The special function keys on the keyboard can be programmed to allow your operator to transfer from accounts receivable to accounts payable, or any other function, at the touch of a key. This simplicity of operation means no operator time lost looking up codes and no training problems when back up or new operators are needed. Of course you can have "password" operations to allow limited or secret access to proprietary information.

The positioning and flexibility of the dual disk drive in you WCS/40 is also very user oriented. The large fixed disks have two removable platters and two fixed platter of 5,013,504 bytes each. Now your operator can back up a full day's processing in ten minutes by simply replacing the removable disks with back-up disks and run the copy routine.

The 2270-1 single diskette drive contains 262,000 bytes of memory and is used in the start-up procedure once at the beginning of the day and then is available for typical storage use with the system for any purpose.

The printer on your WCS/40 is an impact type 11 X 9 dot matrix with pin feed platen and will produce up to four carbon copies at up to 240 lines per minute. Designed for reliability and serviceability specifically for the WCS/40, it is the most advanced designed printer of its kind.

Another source of operator contentment with your WCS/40 will be at systems start up time. Simply turn on a single switch, depress one key and within seconds the system comes on with "READY" on the screen.

I'm sure you will already agree that the WCS/40 is probably the most exciting computer on the market today, but we don't stop there. As you know, the computer industry is volatile and products change or are added to on a regular basis. You will find, however, that the changes are mostly in the central processing unit. Wang can now offer you obsolescence protection in this area of rapid change. The WCS/40 is totally modular and the central processing unit can be exchanged and all peripherals and programs will operate on the next modular CPU produced by Wang Laboratories. Now when new advances are made by Wang, Georgetown Hardware can also advance.

The Wang Computer System/40 combines simplicity of operation with computer power and versatility. Unlike most computer systems, WCS/40 is compact both in design and physical size. It is easy to use, not requiring a special data processing staff. Anyone can learn to use it

SUMMARY

The Wang Computer System Model 40, combined with the Wang Supported Integrated Software Support System and the availability of established Wang associated software vendor network, provides Georgetown Hardware the most cost-effective computer system on the market today. We offer you all of the following:

Simplicity of operation - Programs designed for your application with a minimum of input and a maximum of questions leading the operator -- if you can read and answer questions, you can operate the WCS/40.

Expandability - Both in memory and peripherals, as your needs increase your WCS/40 can grow with you. Basic language programming, hardwired, with built-in disk operating system. Now almost any interested party can program with a minimum of instruction.

Random access data entry - No more searching for ledger cards, sorting of invoices, or pay records. Simply enter information as you receive the records. An invaluable time saver.

Forms saver - Information is verified on the display before it is printed, almost eliminating errors and saving forms.

Enter information only once - No re-input of data or shuffling of ledger cards. All reports will be generated from the information you entered the first time.

One operator has been known to do more with the help of WCS/40 than four people by hand, or two people on a magnetic card system.

Immediate installation means saving money now. Your system can be operating for you within three to four months after receipt and acceptance of your order.

WCS/40 Technical Information

Wang Computer Systems

WCS/40

Wang Computer Systems

The Wang Computer System/40 (WCS/40) is a powerful, multi-user, fixed/removable large disk-based system which offers the customer with concurrent multiple job and multiple site requirements the capabilities of larger computers at a modest small business computer system cost. The WCS/40 can initially provide a versatile multiprogramming capability in an easy-to-use system that not only meets today's data processing needs, but also can easily be expanded to meet tomorrow's growth.

The WCS/40 standard configuration features a large, partitionable 32K high performance Central Processing Unit with a loadable, microcoded, multi-user Operating System and BASIC-2 interpretive language. The operating system resides in a unique second System Memory of over 48K. Also included in the system are three Interactive Terminal/Operator Consoles comprised of 1920 character Cathode Ray Tube (CRT) Displays and operator keyboards, a diskette drive for off-line program and data storage, a 10 million byte fixed/removable disk system for random, mass storage, and a 240 line per minute full width, dual pitch impact printer – all in five coordinated pieces of office furniture. Through additional options, e.g., higher speed 400/600 LPM Line Printers, up to eight interactive terminals, expansion of main memory to 64K, extended disk storage, data communications, and unique Wang multiprocessing disk work stations, the WCS/40 maintains a flexibility for the user, preventing the rapid obsolescence plaguing many lesser small business computer systems.

PROCESSOR

The new multi-user Central Processing Unit constitutes the heart of the WCS/40 configuration. The WCS/40 CPU provides a functional partitioned multi-user capability, with each partition supporting a separate console/terminal. The system utilizes Wang's new Interactive Terminals through a Terminal Multiplex Controller that supports up to eight users simultaneously. (Note: The standard WCS/40 configuration employs the four-port controller, but the eight-port controller may be used instead.)

The CPU utilizes fixed partitions, the number and size of which are specified at system load time. The language supported is BASIC-2, which is essentially compatible with Wang's 2200 VP BASIC, and upward compatible with Wang standard BASIC. Most current Wang disks, printers and communication controllers are supported by the WCS/40 CPU in addition to the Interactive Terminals, which are the only CRT consoles supported by the system.

Because of the large standard memory of the WCS/40, and because of the low overhead required by the multi-user, multiprogramming operating system, several users can be provided with what looks like their own processor. For instance, on the standard WCS/40 configuration with 32K main memory and three interactive terminals, each user can operate in an 8K partition, or two users could be running minimal 4K partitions for such tasks as data entry or inquiry/response, while the third could be running a large 16K partition for more demanding program tasks.

INTERACTIVE TERMINALS/OPERATOR CONSOLES

The main source of system output to the operator is the 24 line, 80 character per line CRT display which enables full-screen operator prompting and validation of keyed characters. The screen measures 12 inches (30.4 cm) diagonally and displays 1920 character positions. The display and keyboard support both upper and lowercase alphabetic characters. The keyboard consists of four zones: (1) a typewriter-like keyboard, (2) program control function keys, (3) a numeric keypad, and (4) a row of special function keys. Associated keyboard electronics and display logic are, of course, contained within the Interactive Terminal housing.

When running application programs, all terminals function identically as interactive data entry terminals. For operations which involve direct communication with the system, however, one of the terminals has a special status. This terminal functions as the operator's console for operations such as initializing the system, loading programs, and receiving system-generated error messages.

A programmable audio alarm is provided to signal the operator when special conditions occur. Brightness and contrast controls provide a sharp, clear image on the screen. Display speed is 9600 bps, which allows the entire screen to be filled almost instantaneously. Optionally, one of Wang's broad range of character and line printers may be attached to the Model 2236 Interactive Terminal, providing a hardcopy output of all or selected transactions. Each terminal is equipped with a buffer in the Multiplex Controller, allowing CRT operations and printing to proceed concurrently.

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Wang Computer Systems

TERMINAL MULTIPLEX CONTROLLER

Consisting of a microprocessor, communication electronics, and separate input and output buffers for each terminal, the Multiplex Controller is available in two versions. The first supports up to four Interactive Terminals and is standard on the WCS/40, using one I/O slot. The second supports up to eight Interactive Terminals, and may be optionally employed on a WCS/40, occupying two I/O slots. Because all multiplexer electronics are contained on the controller boards, neither a separate chassis nor a power supply is required.

The microprocessor coordinates data transfer between the CPU, the Multiplex Controller I/O buffers, and each terminal; therefore, it performs overlapped processing duties by leaving the CPU free to perform each user's programming in the assigned CPU partition, while it handles full-duplex asynchronous communication with all Interactive Terminals. Each terminal's 256-byte input buffer accepts keyed input, while its output buffer concurrently displays characters on the respective terminal's CRT screen.

Line handling between the WCS/40 CPU and each Interactive Terminal is asynchronous full-duplex at up to 9600 baud. Each Interactive Terminal can be situated in a 1000 foot direct local, extended local through "short haul" modems, or remote environment through compatible modems. In all cases, the four or eight plugs at the Multiplex Controller and the plug at the Interactive Terminal are 25-pin, RS-232-C compatible.

STORAGE

The WCS/40 System is equipped with a 262 kilobyte diskette unit and a fixed/removable hard disk with 10 megabytes – providing high-speed, direct access external storage. The use of removable disks permits off line program and data storage capacity, limited only by the number of disks one has on hand. The inclusion of a diskette drive allows a media interchange mechanism between systems and data entry devices. Optionally, an additional 10 megabytes of fixed/removable hard disk storage may be added, along with two additional diskette drives. One or more of the diskette drives may be added with IBM 3740 compatibility.

PRINTER

The WCS/40 Line Printer is a 240 lines per minute matrix impact printer. It prints either a 136-character line (10-pitch format) or 160-character line (nominal 12-pitch format) utilizing four print heads which operate in unison, printing in both forward and reverse directions. The four print heads enable the Line Printer to maintain a printing rate of 240 lines per minute independent of line size and pitch format. Its unique printing scheme, selectable line length, line density (6 or 8 lines per inch) and additional standard features combine to provide high quality printed output to the WCS/40.

The Line Printer uses a high density dot matrix (11 x 9 for 10 pitch and 9 x 9 for 12 pitch) to print a full ASCII set of 96 characters containing both upper and lowercase letters, numbers and symbols. Standard features of the printer include a CLEAR switch, alarm lamp and tone, manual line feed, adjustable print head carriage for multiple forms, vertical format control with punched tape loop, paper feed control with pin-feed units, bottom-loading paper feed with concealed tray, full-line buffer, and a SELECT/deselect switch to enable the printer to receive data from the WCS/40 or to halt printing temporarily without causing loss of data.

WCS/40 OPTIONS

WORK STATION

The Work Station brings independent remote processing power to your Wang system, along with full access to your disk data base. It is a powerful, compact and complete computer designed to complement a WCS/40 system.

Up to three Work Stations can be multiplexed to any WCS/40 equipped with a Model 2230 MXA disk multiplexer. Work Stations can concurrently carry out different processing tasks while sharing a common disk data base. Simplicity of operation, modularity of design, a powerful BASIC language set, and true multiprocessing power highlight the Work Station.

SOFTWARE

The Multiplex Controller, and thus the interactive terminals, are programmable through supplied Terminal Access Method (TAM) utility software. TAM subroutines are easily incorporated into user-written BASIC Language programs, and simplify programming a multi-terminal configuration because of their modular functions. Terminal polling using TAM, which is usually done on an equal priority

WCS/40

basis, does allow timing priorities among the terminals. TAM also provides display control functions and returns keyed messages of up to 80 characters to the user's program.

Software currently available in the 2200 Series products are also compatible with WCS/40, thereby making available a vast library of programs that have been developed over the years.

AVAILABLE 2200 PERIPHERALS

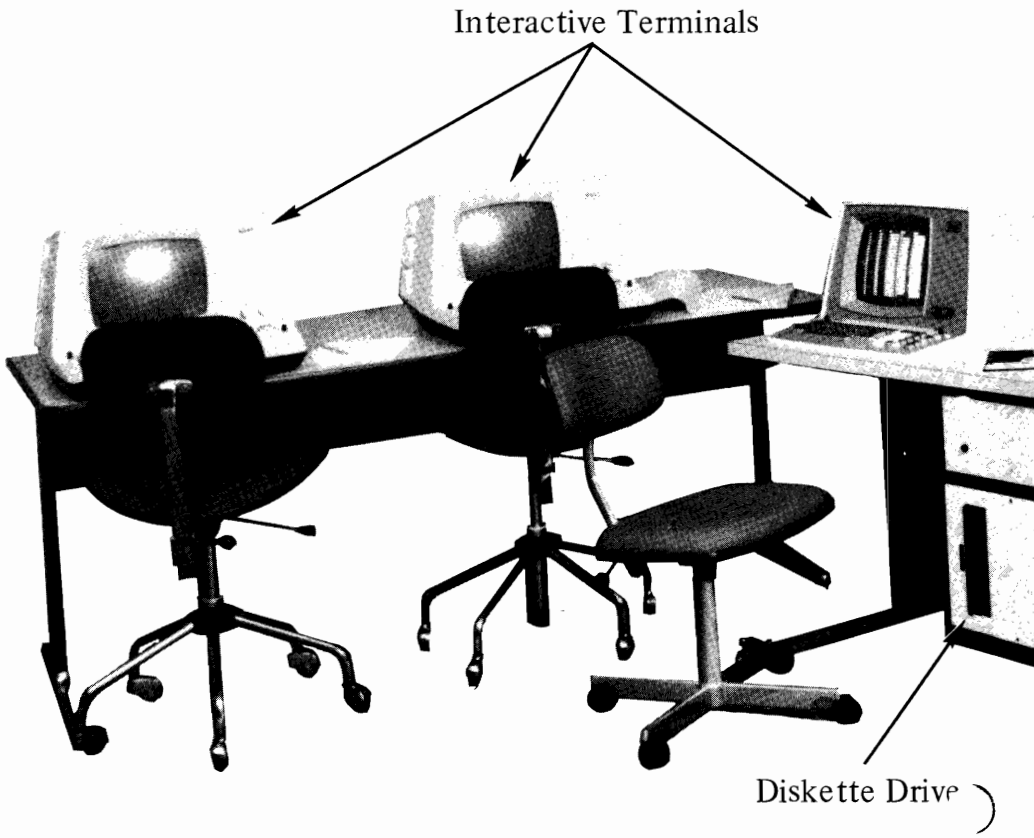
Model 2221W Line Printer (132 Columns)
Model 2227B Buffered Asynchronous Communications Controller
Model 2228B Bisynchronous/Asynchronous Communications Controller
Model 2230MXA Four-Port Disk Multiplexer
Model 2230MXC-2 Eight-Port Controllers
Model 2231W-1 Line Printer (112 Column)
Model 2236MXC Eight-Port Multiplex Controller
Model 2236 Terminal/Consoles
Model 2260-2 Twenty Megabyte Disk
Model 2261W High Speed Line Printer
Model 2263-1 400 LPM Printer
Model 2263-2 600 LPM Printer
Model 2270-1, -2, -3, Diskette Drive

WCS/40 INSTRUCTION SET

COM	IF. . .THEN	PRINT AT
COM CLEAR	Image (%)	PRINT HEXOF
DATA	INPUT	PRINT TAB
DEFFN	KEYIN	PRINTUSING
DEFFN'	LET (Assignment)	PRINTUSING TO
DIM	LINPUT	READ
END	MAT COPY	REM
FN	MAT MOVE	RESTORE
FOR. . .TO	MAT SEARCH	RETURN
GOSUB	ON/GOSUB	RETURN CLEAR
GOSUB'	ON/GOTO	STOP
GOTO	PRINT	

Basic Commands

CLEAR	HALT/STEP	RENUMBER
CONTINUE	LIST	RUN
		RESET



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Disk Statements

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	

Absolute Sector Addressing Mode Statements

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

Character EDIT Instruction Set

The Character EDIT Instruction Set provides greater editing flexibility for the WCS/40 in all memory sizes. 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.

Sort Instruction Set

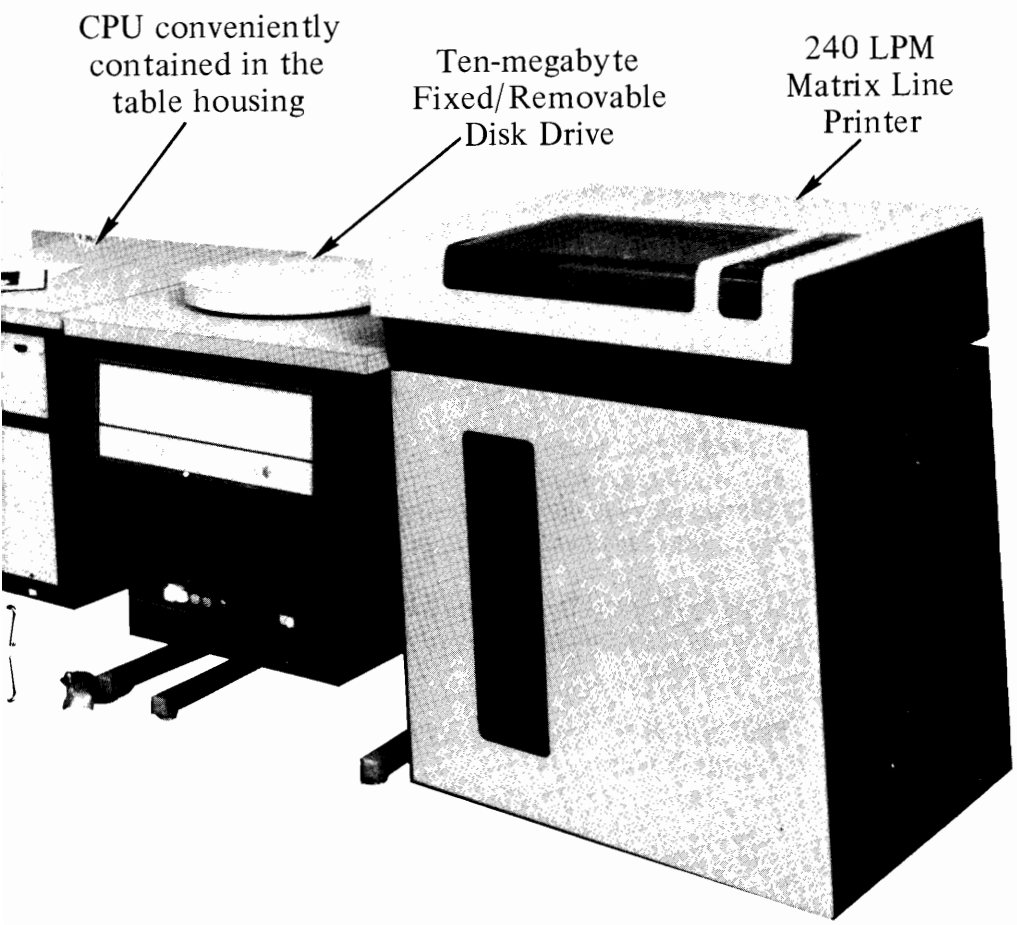
The SORT Instruction Set includes three matrix statements for flexible and rapid searching, moving and sorting data on the WCS/40. These statements are particularly effective in speeding up sorting operations, performing multi-file merges, and executing multi-pass searches over large bodies of data. The three statements are:

MAT MERGE MAT MOVE MAT SORT

Matrix Instruction Set

A complete Math Matrix Instruction Set is available on the WCS/40 and provides fourteen built-in matrix operations.

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



Technical Information

Wang Computer Systems

General I/O Instruction Set

The General I/O Instruction Set for the WCS/40 adds five BASIC language statements to the system.

Statement	Description
$GIO	A generalized I/O statement designed to perform data input, data output, and I/O control operations with a programmable signal sequence.
$IF ON	A statement designed to test the Ready/Busy signal of an I/O device (or test the Empty/Full signal of the input buffer on a device controller board) and initiate execution of a conditional branch to a specified line number.
$TRAN	A statement designed to facilitate high-speed character code translations.
$PACK $UNPACK	Statements designed to facilitate data packing and unpacking by fields or delimiters, between a specified alpha-numeric array buffer and specified variables in an argument list.

String Functions:

STR	VAL
LEN	NUM
HEX	
VER	

User-Defined Special Function Keys

All 32 Special Function Key operations can be defined by the user 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.

WCS/40 Keyboard Operations

The keyboard has two modes of operation: A/A and A/a. The A/A mode forces all alphabetic characters to uppercase – a useful feature when entering program text and in many data entry operations. A/a mode functions as a standard typewriter providing upper and lowercase alpha characters.

Character EDIT Mode

The Character EDIT Mode is designed to facilitate editing of lines of program text recalled from memory or data being input and displayed on the CRT: ←-(Multispace left), ←(Space left), →(Space right), – →(Multispace right), BEGIN, END, ↑ (UP), ↓ (DOWN), INSERT, DELETE, ERASE, and RECALL.

The EDIT Key is used to enter EDIT mode. The RECALL key is used to recall a program line previously entered into memory. The Multispace (left and right) keys are provided to move the cursor five spaces to the left or right. Two Space keys are provided to move the cursor a single space to the left or right. BEGIN repositions the cursor to the start of the current line, END moves it to the end of the current line. Up and down arrows move the cursor up or down one line on the CRT. The INSERT key is used to expand a line to allow for character insertion. The DELETE key causes the character at the current cursor position to be deleted. A program or data line can be erased from the current cursor position to the end of the line by touching the ERASE key.

SPECIFICATIONS

WCS/40 Central Processing Unit
Memory size: 32K, 48K, 64K

WCS/40 Fixed/Removable Disk Storage Capacity

Sectors per Platter	19,584
Total Sectors	39,168
Bytes per Platter	5,013,504
Total Bytes	10,027,008

Performance

Rotation Speed	2,400 RPM

Access Time (Position Head to Track)

Minimum (one track)	4.5 ms
Average (across one-half available tracks)	40 ms
Maximum (across all available tracks)	80 ms

Latency Time (Platter Rotation to Sector on Track)

Average (one sector read/write one-half revolution)	12.5 ms

MOVE/COPY Time (Entire Disk Platter)
Approx 10 min

Technical Information

Wang Computer Systems

SPECIFICATIONS (Cont.)

WCS/40 Diskette Storage Capacity
Platters 1
Sectors per Platter/total Sectors 1,024
Bytes per Platter/total bytes 262,144

Performance
Rotation Speed . . . . . 375 RPM

Access Time (Position Head to Track)
Minimum (one track) . . . . . 15 ms
Average (across one-half available tracks) . . . 401 ms
Maximum (across all available tracks) . . . . . 803 ms

Latency Time (Platter Rotation to Sector on Track)
Average (one sector read/write one-half revolution) . . . . . 80 ms
Additional sectors in same revolution . . . . . 40 ms

Read/Write Time
One 256 byte sector (including CPU, Controller overhead) . . . . . 21.8 ms

MOVE/COPY Time (Entire Disk Platter)
Approx 2 min

Size of WCS/40 Console & CPU & Storage
Height . . . . . 40 in. (101.6 cm)
Depth . . . . . 30 in. (76.2 cm)
Width . . . . . 72 in. (182.84 cm)
Weight . . . . . 385 lb (174.6 kg) (approx)
Cable . . . . . 8 ft (2.4m) to power source

Power Requirements
115 or 230 VAC ± 10%
50 or 60 Hz ± 1 Hz

Wattage
900W

Operating Environment
50°F to 90°F (10°C to 32°C)
20% to 80% Relative Humidity

Recommended Relative Humidity
35% to 65%

WCS/40 Interactive Terminal/Console
Size
Height . . . . . 13½ in. (34.3 cm)
Depth . . . . . 20½ in. (52 cm)
Width . . . . . 19¾ in. (50.2 cm)
Weight
51 lb (23.1 kg)

CRT
Display Size . . . . . 12 in. diagonal (30.4 cm)
Capacity . . . . . 24 lines, 80 characters/line
Character Size
Height . . . . . 0.16 in. (0.4064 cm)
Width . . . . . 0.09 in. (0.2286 cm)

Power Requirements
115 or 230 VAC ± 10%
50 or 60 Hz ± ½ Hz
255 Watts

Fuses
2.5A @ 115V/60 Hz
1.2A @ 230V/50 Hz

Operating Environment
50°F to 90°F (10°C to 32°C)
20% to 80% relative humidity, allowable
35% to 65% relative humidity, recommended

Cable
One 8 ft (2.4m) cord to power source.
One length of 25 ft (7.6m) direct connection cable is provided with each 2236; extension cables in increments for distances up to 1,000 ft (304.8m) are available optionally. Connection from modems to Wang equipment is optionally available also in lengths of 12 ft (3.7m), 25 ft (7.6m), and 50 ft (15.2m). Connectors and cable are 25-pin RS-232-C compatible.

WCS/40 Printer
Printer Size:
Height . . . . . 36 in. (91 cm)
Depth . . . . . 26 in. (66 cm)
Width . . . . . 27 in. (68.6 cm)
Weight . . . . . 210 lb (94.5 kg)
Speed . . . . 240 lines/min independent of line length

Character Configuration
11 x 9 and 9 x 9 dot matrix (dots not in adjacent columns of same row)
10 char/in. (4 char/cm) or 11.76 char/in. (4.6 char/cm), selectable
6 lines/in. (2.4 lines/cm) or 8 lines/in. (3.1 lines/cm), selectable

Technical Information

Wang Computer Systems

SPECIFICATIONS (Cont.)

Character Set
Full ASCII, 96 characters, both upper and lowercase

Line Width
136 characters, maximum with 10 pitch
(68 characters, expanded)
160 characters, maximum with 12 pitch
(80 characters, expanded)

Ribbon
Nylon, double spool, reversible
1½ in. (3.8 cm) wide
64 yd (58.5m) long

Switches/lamps
ON/OFF, SELECT, PITCH, LINE/IN., LINE FEED, TOP OF FORM, CLEAR, FORMS OVERRIDE, paper out alarm and lamp, power on lamp, select lamp, and alarm tone.

Control Codes
Audio Alarm HEX (07), Line Feed HEX (0A), Vertical Tab HEX (0B), Form Feed HEX (0C), Expanded Print HEX (0E), and
Delete (to clear buffer of partial line) HEX (7F).

Vertical Format Control
3-channel, std – 1 in. (2.54 cm) tape. Vertical Tab, Top of Form, Page Reject.

Paper Size
Maximum width ..... 14.9 in. (37.8 cm)
Minimum width ..... 5.0 in. (12.7 cm)
Paper width settings adjustable
maximum form length..... 11 in. (27.9 cm)
(Up to four copies plus original can be printed.)

Cable
6 ft (1.8m) to power source
12 ft (3.7m) to controller

Standard Warranty Applies.

Maintenance Contract Available.

ORDERING SPECIFICATIONS

A multi-user, partitionable, multi-programming Central Processing Unit (CPU) with reloadable microcoded Operating System, and interpretive BASIC language with over 48K RAM Reserves System Storage. The CPU must have at least 32K bytes of additional user RAM memory, expandable in 16K byte increments to 64K bytes and be able to drive a 136-column High-Speed Printer. A powerful EDIT feature must be available as part of the operating system. The CPU must be capable of supporting any or all of a number of Wang Disks and Printers, as well as the Model 2228B Telecommunications Controller.

A single removable diskette drive and a ten megabyte fixed/removable disk drive capable of storing programs and data for the Wang WCS/40. The disk must provide a storage capacity of 10,289,152 bytes. Disk platters must be easily inserted and removed from the unit; individual platters must be formatted automatically by the unit. The System must provide the capability to read and write multi-sector records of any length, and to use entire arrays as arguments. The system also must provide an internal disk file management system, as well as a number of BASIC statements and commands which permit the programmer to design his own disk management system. Finally, the system must provide a rapid platter-to-platter backup capability for the disk units. Three interactive terminals must also be provided with the system, each consisting of a 1920 character CRT (80 x 24) and typewriter keyboard.

A bidirectional printing, 4-head line printer providing complete alphanumeric printing capability. It must print a full-line of up to 160 characters using a dot matrix printing technique with either a 11 x 9 or 9 x 9 dot matrix. It must print a full ASCII character set with both upper and lowercase letters in either 10 pitch (136 column) or 12 pitch (160 column) format, and react to ASCII control codes. All printable characters must be fully programmable and the printer must have a full-line buffer. It must have expanded print capability, a selectable 6 lines/in. or 8 lines/in. format and print 240 lines per minute (independent of line length).

WANG LABORATORIES, INC.
ONE INDUSTRIAL AVENUE, LOWELL, MASSACHUSETTS 01851, TEL. (617) 851-4111, TWX 710 343-6769, TELEX 94-7421

Printed in U.S.A.
700-4160
2-77-20M

[PRICING]

QUOTATION

No. WL

WANG LABORATORIES, INC.

NDUSTRIAL AVENUE, LOWELL, MA. 01851, TEL. (617) 851-4111, TWX 710 343-6769, TELEX 94-7421

DATE OF QUOTATION 6-9-77

Requested Delivery Date: [redacted]eks A.R.O.

Please Send Purchase Order To:

TO

GEORGETOWN HARDWARE, INC.
6201 13th South
Seattle, Washington 98108

WANG LABORATORIES, INC.
200 West Thomas, Suite 106
Seattle, Washington 98119

GENTLEMEN: WANG LABORATORIES, INC. IS PLEASED TO SUBMIT TO YOU THE QUOTATION SET FORTH IN DETAIL BELOW.

Very truly yours,
WANG LABORATORIES, INC. Per Charles King

QUANTITY	DESCRIPTION	PRICE
1 each	WCS/40-8 Including: 2200 MVP Central Processing Unit with 32K user memory, 9 Input/Output slots, 2236 MXD-1 Interactive Terminal Controller, one 2236 Interactive Terminal, 2270-1 Diskette Drive Unit, 2260B-2 20 meg Dual Disk Drive, 2261W 240 Line per minute Printer, 22C31 Triple Controller, Desk, Printer Stand and Disk Enclosures	$ 54,150.00
1 each	2207A Interface Controller	600.00
	Option: Each additional Interactive Terminal $2,400	
	This order to be on Program Mod 0 To be released by customer only	
	UNLESS OTHERWISE STATED IN WRITING THIS QUOTATION IS GOOD FOR 30 DAYS. ALL AMOUNTS QUOTED ARE F.O.B. TEWKSBURY, MASS. AND ARE EXCLUSIVE OF STATE AND LOCAL TAXES. ALL QUOTATIONS INCLUDE TERMS AND CONDITIONS ON THE REVERSE SIDE HEREOF.	
/	ANNUAL PREVENTATIVE MAINTENANCE CONTRACT (PER MONTH)	487.50
	TOTAL	54,750.00

We shall be pleased to supply any further information you may desire and trust that you will decide to favor us with this order which will receive our prompt and careful attention.

YOUR SIGNATURE BELOW AND ACCEPTANCE BY WANG LABORATORIES, INC. WILL CONVERT THIS QUOTATION TO A PURCHASE AGREEMENT WHICH INCLUDES THE TERMS AND CONDITIONS OF HARDWARE SALE PRINTED ON THE REVERSE SIDE HEREOF.

CUSTOMER (Please Print) Georgetown Hardware

SIGNATURE Ronald W Kelly DATE 6.29.77

TITLE President

ACCEPTED: WANG LABORATORIES, INC.

BY: _____

CUSTOMER

Printed in U.S.A.
700-0041J
2-77-15M

SOFTWARE PRICING

Standard Turnkey Module Costs:

1. *Accounts Payable*	
2. *Accounts Receivable*	
3. *Inventory Control*	
4. *General Ledger*	
5. *Payroll*	
6. *Sales Analysis*	
	$ 8,160
Modification and Custom Work	3,000
Installation and Training	1,200 OK
	$ 12,360
Time and Material Pricing for NCR Interface Software between $1500 and $3000	3,000
TOTAL	$ 15,360

[SUPPORT]

SUPPORT

HARDWARE

For most Wang users, a Preventive Maintenance Contract should be as much a part of the computer service they buy as the electrical cords that plug their systems into the wall.

A Preventive Maintenace Contract offers you numerous advantages and benefits:

The preventive maintenace service itself - Because Wang is taking care of your units on a regularly scheduled basis, you know they are not going to break down often.

On-site service - You get unlimited service calls at no extra charge, and you know how much replacement parts will cost because they are supplied under the guaranteed contract price.

Automatic engineering changes - When Wang makes engineering improvements on a product, we automatically install them on maintenace customers' equipment whenever possible, at no extra charge.

Fixed annual cost - We won't suddenly raise our prices on maintenace customers. The fixed annual cost saves paperwork on purchase orders and invoices, and helps you plan your budget.

Priority service response - When repair service is necessary, the maintenance customer is at the top of the list. We can guarantee response within four hours of an urgent call.

Reserved after-hour service - On request and payment of a standby fee, we will make a service representative available to the maintenance customer for second shift and Saturday emergency repair work.

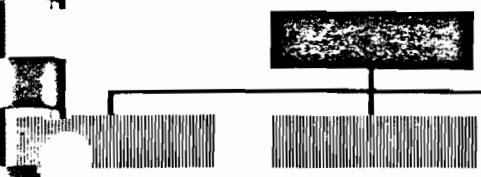
Local spares stocking - Since we base our inventories at the local level on the known needs of our maintenance customers, they receive first priority when these parts are needed for repairs.

Priority shipment of repair parts - As with service, when shipment of parts is necessary, the maintenance customers' parts will receive first priority.

These are eight good reasons, we believe, why you should obtain a Preventive Maintenance Contract. Maintenace Contracts lead to more efficient service plans and, consequently, better service for you.

and it can work in the same room with you. Electrical and air conditioning requirements are minimal, i.e., standard 115v ac grounded plug, 50½ to 90¼ F operating environment.

Please note, enclosed in this section, the data sheets and quotations for hardware.



THE OFFICE MANAGER

MANAGEMENT AND EDP SYSTEMS SUPPORT

SYSTEMS DESIGNED AND PROGRAMMED BY AN OFFICE MANAGER,

FOR AN OFFICE MANAGER ... SOMETHING UNIQUE TO OUR INDUSTRY

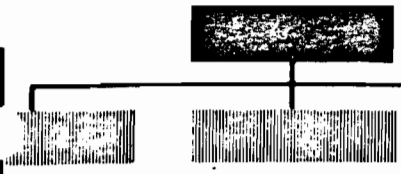
THE OFFICE MANAGER, INC. was formed in 1973 to provide administrative and financial services to business. We became frustrated with the lack of user and operator oriented DP systems and software. In 1974 THE OFFICE MANAGER began developing its own programs and procedures. The result, complete accounting and text editing systems designed for the WANG 2200 minicomputer, is described in this brochure.

Our programs are of the latest technology -- designed and programmed for the nonskilled operator as well as the most sophisticated corporate officer.

THE OFFICE MANAGER does not sell a product only; we sell a service and will continue to meet your needs on a timely and efficient basis. Our "Turnkey" Software Update and Maintenance Contract, plus our working association with your local vendor, will ensure local software support and continuing program enhancements.

Thank you for the opportunity to make this contact. Feel free to call with any questions.

P.O. Box 88067, 550 Industry Drive, Seattle, Washington 98188 Phone: (206) 575-0946



THE OFFICE MANAGER

MANAGEMENT AND EDP SYSTEMS SUPPORT

Your choice of computer software is the most important decision you will make affecting the success of your minicomputer installation. The ideal equipment configuration with poor quality software will prove an endless source of problems and frustrations. On the other hand, carefully designed, proven, top-quality software will mean a smooth installation, trouble-free operation, and dramatic cost savings.

What makes our software better? First of all, we offer dozens of special features not available with most systems. For example, flow-through from all journals to both General Ledger and Job Costing, variable-period comparative financial statements, A/R and A/P ageings by job, vacation and sick leave accruals, and many more.

Second, our software is extraordinarily flexible. Our standard "turn-key" systems permit you to custom format your financial statements, to define your payroll earnings and deduction categories, and to create your own job control numbering structure. In short, you can have a customized system that is thoroughly tested and carefully documented!

Third, our software is operator oriented. Every input prompt message is clearly written, Numerous keying errors are trapped on input. Mistakes can be easily and quickly corrected. All programs are 100% consistent in outward appearance - this makes the system easy to learn. The system recovers from power failures without loss of data. We could go on. We use our own software in our service bureau and we like things to be easy.

Fourth, our software is designed for the manager. Reports are carefully formatted and contain the information you need. A complete audit trail is provided and the accuracy of reports can be quickly verified. Our job is to make your job easier.

Fifth, and perhaps most important, our staff of professionals stands behind our product. We can provide that special report you need, train your operators, answer your questions, and assist with the many details of your minicomputer installation. And we won't forget about you. You can count on our support whenever you need it.

We hope you will choose our product and we look forward to working with you.

P.O. Box 88067, 550 Industry Drive, Seattle, Washington 98188 Phone: (206) 575-0946

[BROCHURES]

INSTALLATION REFERENCES

Firm	Contact	Application	Phone
Goodyear Tire & Supply	Jim Myer	Distribution (Portland)	(503) 226-6671
Bocek Brothers	Bob Bocek	Job Costing, Payroll	747-2450
Boeing Company	Fred Zoesch	Finance, Job Costing	773-8455
Norman Associates	John Norman	Engineering, Finance	883-1383
Bayley Electric	Rich Bayley	Payroll, Job Costing	325-5374
Bayley Construction	Bob Bayley	Payroll, Job Costing, Gen. Ledger	323-8820
Bellevue Community College	Lynn Tooley	Education	641-2321
Seattle Packaging	Gordon Younger	Inventory, Job Costing, Gen. Buss.	725-3000
Simco Heating	Al Churchill	Job Cost Estimating, Gen. Buss.	(509) 248-6010
Developmental Systems	Mike Korach	Real Estate, Inventory Analysis	927-3776
Comparative Marketing	Gretchen Marszalk	Stock Market Analysis	454-7685
Boeing Company	Henry Parsinon	Finance, Job Costing	773-2252
Modern Manufacturing	Bill Hunt	General Business, Job Cost	226-4500
City of Bellevue	Dick Brown	Telecommunications	454-8161
Hornblower & Weeks	Paul Burns	Market Analysis	223-4268
Foster High School	Don Sealy	Education	243-1771
The Office Manager	Jerry Hill	Services, A.R., A.P.	575-0946
Krueger Engineering	Norm Krueger	Engineering, Business	456-1661
Frank Duncan Company	Mr. Jeffers	Distribution, Sales Analysis	622-4885
Holaday-Parks Fabricators	Vi Sutherland	Job Costing, Payroll	763-8500
Corliss Company	Harry Corliss	Inventory, A.R., A.P., G.L.	838-0900
Laurence Payne, CPA	Laurence Payne	Payroll, G.L., Job Costing	255-1596
Bob Windecker	Bob Windecker	Accounting, Engineering	633-3283
Walter Sutton	Walter Sutton	Construction Consultant	226-1966
Conifer Developments	Pay Byrne	Real Estate, Construction Mgmt.	474-9555
Boeing Company	Phil Whitner	New Airplane Design	655-4403
E.P.A.	Jim Hileman	Scientific Statistics	442-1193
Kobayashi Mathisen	Bill Kobayashi	General Ledger, Accounting	363-7665

Boecon Construction	*Glen Gibson*	*Job Cost, Construction Mgmt.*	*237-7900*
Leroy Surveyors	*Herb Leroy*	*Surveying, Engineering*	*863-4481*
Don Swanson Insurance	*Don Swanson*	*A.R., A.P., General Ledger*	*937-3050*
Mitre Corporation	*Ken Brown*	*Structures (Engineering)*	*271-2861*
Wood & Associates	*Steve Wood*	*Engineering, Spec Writing*	*325-4711*
Morrison-Knudsen	*Peter Budelov*	*Payroll, Job Cost, Inventory*	*(208) 345-5000*
All-Pak Container	*Joel Holten*	*A.R., A.P., G.L., Estimating*	*575-0900*
Ghilarducci's Florist	*Mr. Ghilarducci*	*A.R., G.L. (Tacoma)*	*627-2147*
Larsen Electronics	*John Bemmon*	*Distribution (Portland)*	*(503) 573-2722*
Janco-United	*Steve King*	*Distributor*	*624-3063*
Air Pollution Systems	*Ron Ellenberger*	*A.R., Payroll, G.L, Engineering*	*575-0200*

WANG LABORATORIES, INC.
ONE INDUSTRIAL AVENUE, LOWELL, MASSACHUSETTS 01851, TEL. (617) 851-4111, TWX 710 343-6769, TELEX 94-7421

DATA SHEET

Wang Laboratories, Inc. is the only small business computer manufacturer to offer customers *two* cost-effective approaches to fulfilling multi-user application requirements. When highly independent tasks which require extensive processing must be run simultaneously with maximum throughput, Wang's popular programmable Workstation may often be the answer. In addition to the powerful multi-processing Workstation, the extremely cost-effective Wang Model 2236 Interactive Terminal system is an excellent choice for situations where a single task, or similar, related tasks controlled within the same program must be run at multiple terminal sites. Of course, no single approach is always perfectly suited to the diversity of multi-user business applications, but only Wang offers the choice of either multi-processing or multi-terminals.

The remainder of this document explains the Wang Interactive Terminal approach to multi-user, multi-terminal applications.

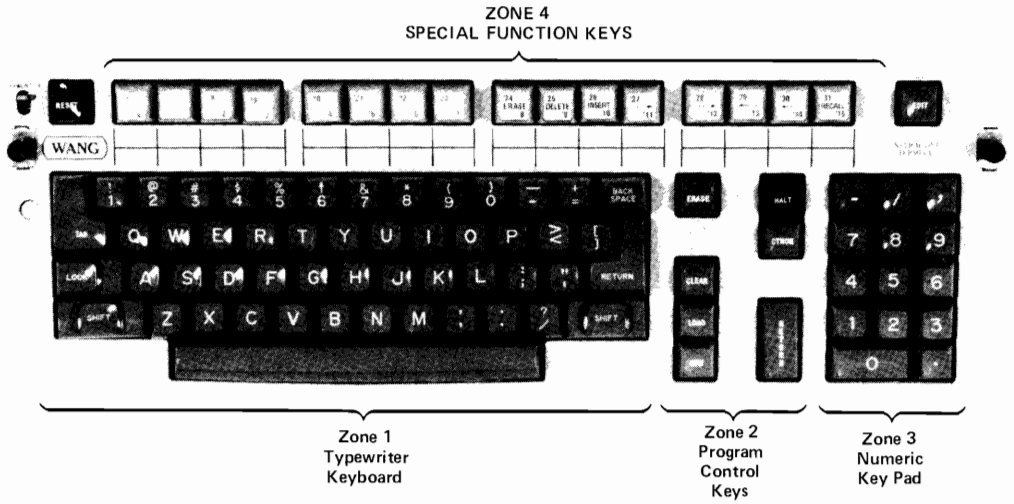
CPU REQUIREMENTS AND CONFIGURATIONS

A single Wang 2200 Central Processing Unit (CPU) equipped with a Model 2236MXC Multiplex Controller can control a network of up to either four (2200T) or eight (2200VP) Model 2236 Interactive Terminals, depending on the CPU used. Up to four Interactive Terminals can perform a typical single-task application under the control of a Wang System 2200T CPU or Wang System 2200S with Option 24. For applications where extensive processing must occur between operator entries, the Wang System 2200VP CPU is recommended to increase overall performance. For applications which require from five to eight Interactive Terminals, a Wang 2200VP is required. In all cases, the multiple-terminal network is controlled by the BASIC Language program which resides in the 2200 CPU. Different tasks controlled within the same program are possible in one network if a 2200VP is used.

Each Interactive Terminal can be located in a local, extended local, or remote environment relative to the 2200 CPU. In addition, Teletype® compatible terminals may be controlled in the same network as the Wang Interactive Terminals by the CPU-resident BASIC Language program.

® Trademark of the Teletype Corporation.

MODEL 2236 INTERACTIVE TERMINAL & MODEL 2236 MXC MULTIPLEX CONTROLLER



SYSTEM OVERVIEW

The operator console of each Interactive Terminal contains a 12-inch (30.4cm) diagonal measure Cathode Ray Tube (CRT) screen for operator prompting and verification, and a typewriter-arranged keyboard with a separate numeric keypad to accept operator-keyed input. Control functions are handled by several types of function keys. Coordination of terminal polling functions, display of operator-prompting messages at each terminal, and return of complete entry fields to the CPU are handled by the microprocessor-based Model 2236MXC Multiplex Controller in conjunction with the BASIC Language program in 2200 CPU memory. The Model 2236MXC Multiplex Controller provides a full overlap capability whereby the Multiplex Controller receives and buffers keyed data while the CPU processes the previous line, for all terminals. Polling and display controls including cursor positioning are supported by the supplied Terminal Access Method (TAM) subroutines, which are efficiently incorporated into BASIC Language application programs.

In addition to a microprocessor, the Model 2236MXC Multiplex Controller contains separate input and output buffers for each terminal, and also handles full-duplex asynchronous communication with each Teletype-compatible or Wang Interactive Terminal at speeds up to 9600 baud. Full-duplex communication indicates two independent communication channels; specifically, one channel communicating keyed characters to the input buffer, while the other channel simultaneously transfers the output buffer's contents to the appropriate display screen coordinates of that terminal. The combination of independent buffering and high-speed full-duplex communication allow uninterrupted keying with simultaneous display use from each Interactive Terminal.

MODEL 2236 INTERACTIVE TERMINALS

The overall operator-orientation of the Interactive Terminal is best revealed by its individual system input and output components. Input to the system occurs via the keyboard, which has superior arrangement and touch. The keyboard consists of four zones: (1) a typewriter-like keyboard, (2) program control function keys, (3) a numeric keypad, and (4) a row of Special Function Keys, as shown in the picture. A keyboard clicker automatically produces a sound when a valid key is touched.

The main source of system output to the operator, the 24 line, 80 character per line CRT display enables full-screen operator prompting and validation of keyed characters. The screen measures 12 inches (30.4cm) diagonally and displays 1920 character positions. The display and keyboard support both upper and lowercase alphabetic characters. Formatted displays providing operator "prompts" and defined entry fields are easily programmed using supplied Terminal Access Method (TAM) subroutines, which support cursor-positioning as well as the display of default values in place of defined entry fields. Associated keyboard electronics and display logic are, of course, contained within the Interactive Terminal housing.

An audio alarm is provided to gain the operator's attention when special conditions occur, and is program-controlled by a HEX (07) code. Brightness and contrast controls provide a sharp, clear image on the screen. Display speed is approximately 1,000 characters per second at 9600 baud. Any standard Wang printer may be optionally plugged into an Interactive Terminal, in which case print lines up to 156 characters are supported.

CENTRAL PROCESSING UNIT (CPU)

The centrally-located 2200 CPU must be equipped with a Model 2236MXC Multiplex Controller. A CRT screen console for the 2200 CPU is *not* required because BASIC program input, using full 2200VP EDIT capability, occurs only from the first Interactive Terminal in the network. The first Interactive Terminal also acts as a system I/O control console for initialization purposes when the 2200 CPU is powered ON. Once a program which controls all network terminals is loaded, the first terminal functions as would any other terminal in the network. Thus the 2200 CPU, Multiplex Controller, and first Interactive Terminal jointly control the network of application-oriented Interactive Terminals.

MODEL 2236MXC MULTIPLEX CONTROLLER

Consisting of one microprocessor, communication electronics, and separate input and output buffers for each terminal, the Model 2236MXC Multiplex Controller is available in two versions. The Model 2236MXC-1 supports up to four Interactive Terminals using one I/O slot of the 2200 CPU. Supporting up to eight Interactive Terminals, the Model 2236MXC-2 may be used only with a 2200VP CPU and occupies two I/O slots. Because all multiplexer electronics are contained on the controller boards, neither a separate chassis nor a power supply is required.

The Multiplex Controller microprocessor coordinates data transfer between the CPU, the Multiplex Controller I/O buffers, and each terminal. It therefore performs fully overlapped processing duties by leaving the CPU free to perform other tasks, such as range checks on the previously-entered line, while it handles full-duplex asynchronous communication and buffering for all other Interactive Terminals. Each terminal's 256-byte input buffer accepts keyed input, while its output buffer concurrently displays characters on the respective terminal's CRT screen.

The Multiplex Controller, and thus the Interactive Terminals, are programmable through supplied Terminal Access Method (TAM) subroutines. TAM subroutines are easily incorporated into user-written BASIC Language programs, and simplify programming a multi-terminal configuration because of their modular functions. Terminal polling using TAM, which is usually done on an equal priority basis, does allow timing priorities among the terminals. TAM also provides display control functions and returns keyed messages of up to 80 characters to the user's program.

The Model 2236MXC Multiplex Controller accommodates either the fixed screen Wang mode or the Teletype mode – the choice of which is selectable for each terminal under software control. In the Teletype mode, Teletype or Teletype-compatible terminals are controlled by the BASIC Language/TAM subroutine program in the 2200 CPU. Teletype characteristics supported include screen line roll, output line length up to 255 characters (plus CR), several forms of backspacing including rub-out, and recognition of standard Teletype ASCII codes. In the Wang mode, Interactive Terminal functions are controlled by the BASIC Language/TAM subroutine program. Characteristics associated with the Interactive Terminals include screen line roll, as well as the fixed screen, multiple input field features associated with masked screen data entry. Only the Wang Interactive Terminals can use the versatile cursor positioning features supported by the TAM subroutines.

COMMUNICATION SPEEDS AND CONNECTIONS

Line handling between the 2200 CPU and each Interactive Terminal is asynchronous full-duplex at up to 9600 baud. Each Interactive Terminal can be situated in a local, extended local, or remote environment relative to the 2200 CPU. In all cases, the four or eight plugs at the Multiplex Controller and the plug at the Interactive Terminal are 25-pin, RS-232-C compatible. A description of each type of connection follows.

If the cable distance between the 2200 CPU and an Interactive Terminal is less than 25 feet (7.6m), transmission rates of 9600 baud occur with direct four-wire connection using a supplied cable. For cable distances beyond 25 feet up to 1,000 feet (304.8m), optional cables are available in 100 foot (30.5m) increments to provide direct extended local connection at speeds of 9600 baud. For cable distances beyond 1,000 feet, modems must be used to provide the remote communication link. Direct connection uses four-wire, twisted, shielded cable.

Two categories of modems may be optionally purchased for short distance or remote connections. Short-haul modems use private four-wire connection and must be asynchronous, full-duplex, RS-232-C compatible modems. For such connections, Multiplex Controller baud rates are factory-wired at 9600 baud, but upon installation may be set at either 300, 600, 1200, 2400, or 4,800 baud by a Wang Service Representative for each terminal. Each Interactive Terminal's baud rate is under manual user control, and must equal the baud rate set for that terminal at the Multiplex Controller.

For true remote connections, telephone lines provide connection between the RS-232-C compatible asynchronous full-duplex modems operating at the same baud rate.

In both cases, two modems are required for each connection between the 2200 CPU and Interactive Terminal. Cable is optionally available for modem connections to Wang equipment at 12 feet (3.7m), with optional extensions of 25 feet (7.6m), and 50 feet (15.2m). Two lengths of modem cable for each Interactive Terminal connection provide the necessary link between the Multiplex Controller (CPU) and its modem, and between the Interactive Terminal and its modem. Modem cable is 25-pin RS-232-C compatible.

2236 SPECIFICATIONS

Size

Height . . . . . 13½ in. (34.3 cm)
Depth . . . . . 20½ in. (52 cm)
Width . . . . . 19¾ in. (50.2 cm)

Weight

51 lb (23.1 kg)

CRT

Display Size . . . . . 12 in. diagonal (30.4 cm)
Capacity . . . . . 24 lines, 80 characters/line
Character Size
Height . . . . . 0.16 in. (0.4064 cm)
Width . . . . . 0.09 in. (0.2286 cm)

Power Requirements

115 or 230 VAC ± 10%
50 or 60 Hz ± ½ Hz
40 Watts

Fuses

2.5 a. @ 115V/60 Hz
1.2 a. @ 230V/50 Hz

DATA SHEET

2236 SPECIFICATIONS (Cont.)

Operating Environment

50°F to 90°F (10°C to 32°C)
20% to 80% relative humidity, allowable
35% to 65% relative humidity, recommended

Cable

One 8 foot (2.4m) cord to power source.

One length of 25 feet (7.6m) direct connection cable is provided with each Model 2236, unless an optional direct connection cable is ordered for that terminal. Cables are optionally available in 100 foot (30.5m) increments for direct connection up to 1,000 feet (304.8m) and are non-extendable. Modem cables are optionally available in lengths of 12 feet (3.7m), with extensions of 25 feet (7.6m) and 50 feet (15.2m); however, combined cable distance from Wang equipment to its modem is 50 ft (15.2m) maximum according to EIA standards.

2236MXC SPECIFICATIONS

Operating Environment

Same as 2200 CPU

Power Requirements

Operates using CPU Power Supply

Communication Modes

Full-Duplex Asynchronous Wang mode for Model 2236's.

Full-Duplex Asynchronous Teletype mode for Teletype-compatible terminals.

Number of I/O Slots Required

Model 2236MXC-1 requires one I/O slot and supports up to four terminals.

Model 2236MXC-2 requires two I/O slots and supports up to eight terminals (2200VP only).

Standard Warrenty Applies

ORDERING SPECIFICATIONS

An integrated Cathode Ray Tube (CRT) and Upper/Lowercase keyboard with numeric keypad. The CRT must be capable of displaying 24 lines, each 80 characters in length, and measure 12" diagonally. Sixteen Special Function keys and one general-purpose function key must be under program control and be easily accessed from the keyboard. Upper and lowercase alphabetic and special characters must be capable of being keyed and displayed on the Model 2236 console. Program control keys must also be provided, because one Wang Interactive Terminal is required to act as the system control console for each CPU network.

The Model 2236MXC Multiplex Controller must be field-upgradable in existing 2200 CPU's. It must be available in four and eight terminal versions, and must provide local direct wire connection at communication speeds of 9600 baud. It must contain one microprocessor and communication electronics, as well as the following for each possible terminal: one 256-byte input buffer and a separate output buffer for display and printer purposes. For non-clocked (short-haul) modem use, it must provide speeds at either 300, 600, 1200, 2400, 4800, or 9600 baud for each terminal. Communication must be asynchronous, full-duplex in either Wang or Teletype compatible modes, which are software selectable. BASIC Language subroutines must be supplied to facilitate display controls, polling functions, and handle data transfer functions. This software must contain a cursor positioning subroutine for use in the Wang asynchronous mode.

Options available must include direct cable connection up to 1,000 feet between CPU and terminal, modem cable connections, as well as printers.

WANG LABORATORIES, INC.
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700-4154
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DATA SHEET

The Wang Model 2260B Fixed/Removable Disk Drive provides a high-capacity, high-performance, direct-access storage medium for all Wang systems except the 2200A. (However, the System 2200S and WCS/10 require Option-24, the Disk ROM, in order to support a disk.) The Model 2260B provides a full ten megabytes (10,027,008 total bytes) of on-line storage capacity, and is designed primarily for users whose data processing applications require a large on-line data base. The 2260B also is available in two smaller configurations, for applications requiring lesser data bases.

PHYSICAL CHARACTERISTICS

The Model 2260B Disk Drive unit holds a pair of disk platters, one fixed and one removable. The disk drive's total storage capacity is distributed equally between the two platters. Because the removable platter (often called a "disk cartridge") is easily unloaded, stored, and replaced, the total off-line storage capacity of the Model 2260B is virtually unlimited.

Each disk platter has two recording surfaces, which are divided into a number of concentric circular recording tracks. Every track is, in turn, subdivided into 24 "sectors". A sector is the smallest addressable unit on the disk, and can store 256 bytes of information (program text or data). The sectors on each platter are sequentially numbered, and individual sectors can be directly addressed.

STORAGE CAPACITY

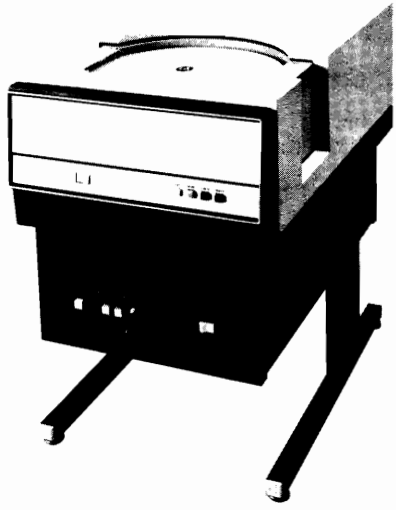
The Model 2260B provides 10,027,008 total bytes (10 megabytes) of storage, divided equally between the fixed and removable platters. Two smaller configurations also are available. The Model 2260B¼ provides 2,457,600 total bytes (2.5 megabytes), and the Model 2260B½ provides 5,013,504 total bytes (5 megabytes) of on-line storage. A smaller configuration is upgradable to a larger configuration. Storage efficiency is determined by a number of factors, including the type of data being stored, and the method of storage. For example, a full-precision number (13 digits) requires nine bytes of disk storage. The PACK statement, however, can be used to reduce each number to as few as two bytes, if 13-digit accuracy is not needed. For purposes of general illustration, the Model 2260B can store about 1,100,000 full-precision (13-digit) numbers, or about 590,000 16-character alphanumeric values.

SPEED

In any external storage device, a necessary adjunct to size is speed. The capability to store large quantities of data is valueless if the data cannot be retrieved with speed and efficiency. The Model 2260B is a high-performance disk drive which offers rapid data access in both sequential and random access modes.

The procedure for accessing a particular sector on the disk has two components, a track access and a disk latency period. Only when the appropriate sector has been accessed can the actual transfer of data between the system and the disk be carried out. The total time required to read or write information on the disk must therefore include the times for the track access and disk latency period.

Track Access Time – The track access time is the time required to position the disk read/write head to a specified track on the disk platter. The average access time for the 2260B is 40 ms (.04 sec). For the 2260B¼ and 2260B½, the average access times are somewhat faster.



MODEL 2260B
FIXED/REMOVABLE DISK DRIVE

Disk Latency Time – Once it is positioned over the appropriate track, the read/write head must wait for the desired sector in that track to rotate to its position. This wait is called the disk latency period. Since the platter makes one complete revolution in 25 milliseconds, the average latency time is one-half this time, or 12.5 ms (.0125 sec).

PLATTER COMPATIBILITY

Special features provided in the 2260B allow it to read disk cartridges generated on a 2230 disk drive. Model 2230 owners who wish to trade up to a 2260B need not, therefore, recreate their entire data base for the Model 2260B.

AUTOMATIC FILE MAINTENANCE

Files can be maintained on disk in one (or both) of two modes: Automatic File Cataloging mode, and Absolute Sector Addressing mode. The BASIC instructions in both of these modes are built into the disk controller itself, and do not require an additional software package.

Automatic File Cataloging – This mode includes 16 BASIC statements which provide rapid, easy access to cataloged files on the disk. Catalog mode permits the user to save and load program and data files by name, without concern for where or how the files are actually stored on the disk. The system itself automatically keeps track of the size and location of each file. The BASIC instructions available in Catalog mode are listed below.

- **SCRATCH DISK** is used to create a catalog on a specified disk platter. The catalog consists of two parts, a Catalog Index and a Catalog Area.
- **MOVE END** is used to alter the size of the catalog after it has been created with SCRATCH DISK.
- **LIST DC** enables the operator to list out the names and locations of all cataloged programs and data files.
- **SAVE DC** is used to name and save BASIC programs on the disk.
- **LOAD DC**, when executed as a command, is used to load a named program from the disk into memory. When executed in a program, LOAD DC can be used to chain or overlay programs from disk.
- **DATASAVE DC OPEN** is used to name and open a new data file on the disk (as many as seven cataloged files may be open simultaneously).
- **DATALOAD DC OPEN** is used to reopen an existing data file on disk. The file is referenced by name.
- **DATASAVE DC** is used to store a data record in a currently open file on disk. Multiple-sector records are written automatically.
- **DATALOAD DC** is used to read data from a currently open file on disk. Multiple-sector records are read automatically.
- **DATASAVE DC CLOSE** is used to close one or all currently open files on disk.
- **DSKIP** and **DBACKSPACE** enable the programmer to skip forward and backward over data records within a cataloged data file.
- **SCRATCH** is used to "scratch" program or data files which are no longer needed. The disk space occupied by a scratched file can be reused for a new file.
- **MOVE** is used to copy the entire catalog (the Catalog Index as well as the Catalog Area) from the fixed platter to the removable, or vice versa. MOVE also automatically deletes all scratched files from the catalog.
- **VERIFY** performs special validity checks on specified sectors to ensure that the data stored in them is correct. VERIFY is normally used following a MOVE or COPY to ensure that information has been copied accurately.
- **LIMITS** enables the programmer to examine the beginning, ending, and current sector addresses of a specified file, as well as the total number of sectors used in the file.

Absolute Sector Addressing – This mode consists of eight BASIC statements which permit the programmer to address specific sectors on the disk directly, thus enabling him to design his own disk operating system. Two of the eight Absolute Sector Addressing mode instructions are special statements which can be used to read or write one sector (256 bytes) of unformatted data. These special statements enable the programmer to write his own control information in individual sectors. The BASIC instructions available in Absolute Sector Addressing mode are listed and explained below.

- **SAVE DA** is used to store programs on disk in Absolute Sector Addressing mode. The starting sector location at which the program is to be stored must be specified.

- **LOAD DA**, when executed as a command, is used to load programs from disk into memory. When executed within a program, LOAD DA can be used to chain or overlay programs from disk. In either case, the starting sector address of the program must be specified.
- **DATASAVE DA** is used to save data records on the disk. The address of the first sector in which the record is to be stored must be specified. Multiple-sector records are written automatically.
- **DATALOAD DA** is used to read data records stored on disk. The address of the first sector in which the record is stored must be specified. Multiple-sector records are read automatically.
- **DATASAVE BA** is a special statement which writes one sector (256 bytes) of unformatted data in a specified sector on disk. (Both DATASAVE DC and DATASAVE DA automatically insert special formatting information in each record; this information is *not* automatically inserted by DATASAVE BA.)
- **DATALOAD BA** is a special statement which reads one sector (256 bytes) of unformatted data from a specified sector on the disk.
- **COPY** is used to copy the contents of a specified range of sectors from one platter to the corresponding sectors on the other platter.

RELIABILITY

To increase the reliability of the disk unit two different checks are made on every sector of information read from the disk. A cyclic redundancy check (CRC) and longitudinal redundancy check (LRC) are performed automatically by the system on the data in each sector when it is read from the disk. If an LRC error is detected, the system returns an error message at once; if a CRC error is detected, the system automatically rereads and rechecks the erroneous sector four times before signalling an error. In addition to the two checks performed automatically by the system, an optional read-after-write verification test can be specified by the programmer, simply by including a special parameter in the appropriate BASIC instruction.

AUTOMATIC SECTOR FORMATTING

A switch-selectable automatic sector formatting feature causes the system to format each sector on a disk platter. In addition, the formatting procedure assigns a unique address to every sector on the platter. Each sector is formatted into four basic sections: a two-byte sector address, two bytes reserved for a CRC value, one byte reserved for a LRC value, and 256 bytes reserved for user's data. The sector address, CRC, and LRC are transparent to the user's software, and are employed by the system for data identification and verification.

AVAILABLE DISK UTILITIES

Wang supports its complete line of 2200 Series disk drives with a variety of disk utility programs. Although new utilities are always being developed, the following utilities are available at the present:

- **KFAM** (Keyed File Access Method): A sophisticated file maintenance system which provides the user with rapid, direct access to individual records in a cataloged file. (Available in two new versions, KFAM-2 and KFAM-3).
- **Disk Sort:** Sorts records in a cataloged disk file.
- **Compression:** Reads source programs stored on disk and compresses them. The resultant compressed program can be saved back onto the disk.
- **Decompress:** Copies a cataloged program file, automatically breaking up all multi-statement lines and assigning each statement a unique line number.
- **List and Cross-Reference:** Source or compressed programs stored on disk are read into memory, decompressed, and cross-referenced. The decompressed and cross-referenced programs can be listed on a printer or displayed on the CRT screen.
- **Copy/Verify:** Copies cataloged disk files from disk to disk, verifying copied files. Extra sectors can be added to copied files.
- **Sort Disk Catalog:** Prints a catalog index listing sorted alphabetically by file name or numerically by sector address.
- **Disk Programming Aids:** A collection of utility routines which perform functions such as search catalog index for file name, open and close cataloged disk files, etc.
- **Disk Dump Utility:** Generates a list of hex codes for a program or data file stored on disk.

DATA SHEET

SPECIFICATIONS

STORAGE CAPACITY

	2260B¼	2260B½	2260B
Sectors per Platter	4,800	9,792	19,584
Total Sectors	9,600	19,584	36,168
Bytes per Platter	1,128,800	2,506,572	5,013,504
Total Bytes	2,457,600	5,013,504	10,027,008

PERFORMANCE

Rotation Speed

2400 rpm

Access Time (Position Head to Track)

Minimum (one-track) . . . . . 4.5 ms

Average (across one-half available tracks)

2260B¼ . . . . . 20 ms

2260B½ . . . . . 28 ms

2260B . . . . . 40 ms

Maximum (across all tracks)

2260B¼ . . . . . 40 ms

2260B½ . . . . . 56 ms

2260B . . . . . 80 ms

Latency Time

Average (one-half revolution) . . . 12.5 ms

Read/Write Time

One 256-byte sector including CPU/ Controller Overhead . . . . . 15 ms

Move/Copy Time (Entire Disk Platter)

Approx 10 min

GENERAL SPECIFICATIONS

Physical Dimensions

Height . . . . . 32½ in. (82.6 cm)

Width . . . . . 17½ in. (44.5 cm)

Depth . . . . . 29 in. (73 cm)

Weight

126 lb (57 kg)

Power Requirements:

Voltage: 115 or 230 VAC ± 10%
50 or 60 Hz ± 1 cycle

Power: 800 watts start-up
425 watts running

Cabling

10 ft (3m) cable with connector to female receptacle on the disk controller board in CPU.

8 ft (25m) to power source.

Operating Environment

50°F to 95°F (10°C to 35°C)

20% to 80% relative humidity

ORDERING SPECIFICATIONS

A disk drive unit capable of storing and retrieving information for a Wang system. The unit must be available in three configurations providing 2½, 5, or 10 megabytes of on-line storage; total storage should be divided equally between two separate platters, one of which is removable. The two platters must be addressable interchangeably. It must be possible to read or write multi-sector arguments of any length on disk, and to use entire arrays as arguments. The disk unit must also provide capability to produce backup copies of all or part of each disk platter.

The system must provide a built-in data management system as well as a number of statements which enable the programmer to design his own operating system. All of these features, as well as all interface and control electronics, must be included in the quoted price of the disk unit; none should be considered optional extras. The disk unit must be compatible with other I/O and storage devices in the system, and a single system must be capable of supporting a minimum of four disk units.

Standard Warranty Applies

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

WANG LABORATORIES, INC.

1 INDUSTRIAL AVENUE, LOWELL, MASSACHUSETTS 01851, TEL. (617) 851-4111, TWX 710 343-6769, TELEX 94-7421

Printed in U.S.A.
700-3483C
10-76-15M

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

DATA SHEET

With the Model 2207A I/O Interface Controller, the following non-Wang equipment can be interfaced directly to the Central Processing Unit (CPU) of a System 2200 configuration:

- an RS-232-C compatible Teletype®, e.g., the Model 33 or 35,
- a Teletype-equivalent terminal, or
- an RS-232-C compatible, asynchronous transmission laboratory instrument.

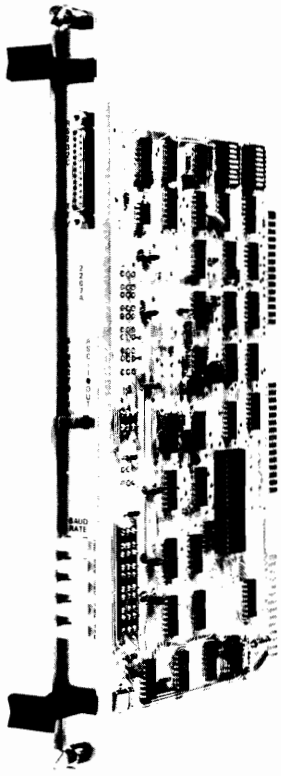
The controller supports asynchronous transmission rates up to 1200 baud with switch-selectable settings of 110, 150, 300, 600, and 1200 baud. The controller also supports two asynchronous formats: (a) 1 start bit, 7 data bits plus an even parity bit, and 2 stop bits, or (b) 1 start bit, 8 data bits, and 2 stop bits.

Two modes of operation are switch-selectable. With the switch in the "ASCII-Out" position, the normal mode for Teletype terminal input/output or tape read/punch operations is in effect. The data format is 7-level ASCII with an even-parity high-order eighth bit. When data is transferred to the CPU via the interface, the parity bit is stripped from each character (i.e., the high-level bit is always zero). When a standard Teletype BREAK signal is received, the interface automatically decodes the signal and sends a HALT/STEP signal to the CPU. Similarly, when a standard ESC (Escape) character is received, the interface sends a RESET signal to the CPU. Thus, a Teletype plugged into a Model 2207A interface can function as a keyboard input device for a System 2200 configuration.

On the other hand, with the operation mode switch in the "Binary-In" position, the data format is 8-bit for input/output operations. All data bits received by the interface are transferred to the CPU without examination of the parity bit. Decoding of BREAK and ESC characters is inhibited. During an output operation, no parity bit change is made in the data when each character is framed with start/stop bits. This second mode of operation can be used to input discrete binary data to the CPU or to input any 8-bit character set.

The Model 2207A interface plugs into any I/O slot in a CPU chassis and has an RS-232-C compatible female plug to facilitate direct connection of a Teletype or other equipment having a cable and compatible male plug. The interface operates with interchange signals recommended by the Electronics Industries Association in "EIA Standard RS-232-C."

All 2200 Series central processors use Wang's BASIC language for control of I/O and internal operations. In particular, the DATALOAD BT and DATASAVE BT statements are needed to control tape read and punch operations using a Teletype Tape Unit. These statements are standard or available with particular CPU options in every case, except for the System 2200A.



2207A I/O INTERFACE CONTROLLER

DATA SHEET

SPECIFICATIONS

Size of Controller Board

Length . . . . . 14 in. (35.56 cm)
Depth . . . . . 6 in. (15.24 cm)
Width . . . . . 1 in. (2.54 cm)

Electrical Connector

RS-232-C compatible (receives 25-pin RS-232-C Male Plug).

Code Format

(a) 1 start bit, 8 data bits, 2 stop bits, or
(b) 1 start bit, 7 data bits, even parity bit and 2 stop bits.

Transmission Rate

Selectable baud rates of 110, 150, 300, 600, and 1,200,all asynchronous.

Special Features

Decodes Teletype BREAK signal into HALT/STEP command and Teletype ESC (Escape) character into RESET command.

Power Requirements

Supplied by the CPU.

ORDERING SPECIFICATIONS

An RS-232-C compatible Teletype controller board for Wang 2200 Series central processors. The controller must support switch-selectable asynchronous transmission rates of 110, 150, 300, 600, and 1,200 baud with code formats of (a) 1 start bit, 8 data bits, and 2 stop bits, or (b) 1 start bit, 7 data bits plus even parity bit, and 2 stop bits.

Standard Warranty Applies.

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

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

Printed in U.S.A.
700-3155B
9-75-2M

[The brochures

Wang Laboratories, Inc. An Overview

and

Wang Laboratories, Inc. 1976 Annual Report

are not included to reduce the file size]

[After the initial proposal in early June, Wang followed a quote in late June for an MVP system, and then two more quotes in August, but back to a VP system configuration. Both August quotes were for the same system configuration, with the difference being the choice between a one time eternal OS license, or a monthly OS service fee.

Mr. O'Kelly did purchase the system, and the following are the quotes and purchase agreement.

He opted for the monthly OS payments.]

WANG LABORATORIES INC.
ONE INDUSTRIAL AVENUE LOWELL, MASS.

TEL. (617) 851-4111
TWX. 710-343-6769

ACKNOWLEDGMENT

ACK	CAT	WORK ORDER NUMBER	WORK ORDER DATE	ORIG.	Credit	PAGE OF
	5	33318–	06/30/77	KD		1

CUST. NO.	TYPE CUST.	NO. INV.	T-CITY	T-CNTY	T-SCHOOL	T-STATE	TERMS	NET 30
037452	89	2	0.00%	0.00%	0.00%	5.40%	0.0 %	30
			0650N	0033N	* N	46N		

STATE CONTRACT	GSA FISCAL	GSA AWARD	DISCOUNT
			0.00%

CUSTOMER P. O.	P. O. DATE	F.O.B. SP.	F.O.B. DEST.	P.P.B.	P.P.D.	COLL.	VIA
QUOTE	06/29/77	X					BEST WAY

SALE	CONS	RENT	LEASE	INT.	XCH
X		%	%		

BILL CYCLE– TERMINATING / /

SALESMAN	EMP. #	RDB #
KEMP CHARLES H	08269	1832 [redacted]

SALESMAN	EMP. #	RDB #
		[redacted]

SALESMAN	EMP. #	RDB #
		[redacted]

CUSTOMER:
GEORGETOWN HARDWARE INC
6201 13 S
SEATTLE WA 98108

SHIP TO:
GEORGETOWN HARDWARE INC
6201 13 S
SEATTLE WA 98108

INVOICE TO:
GEORGETOWN HARDWARE INC
6201 13 S
SEATTLE WA 9.108

		STATUS	SHIPPING DATE	PACKING LIST NO.
2	3			

1 = Complete
2 = Final
3 = Partial

* EST. * DEL.	DESCRIPTION	PART NUMBER	SERIAL NUMBERS	QTY. ORDERED	UNIT MEAS.	PRICE	AMOUNT		QTY. SHIPPED
	PGM HOLD DO NOT SHIP UNTIL RELEASED BY *Bruce Brunswick*								
02/03*	WCS 40-8 (32KMEM)WCSF1 10 MEG DISK	176-1040-8		1	EACH	0.00	0.00		
02/03*	I/O INTERFACE CONTROLLER	177-2207-A		1	EACH	600.00	600.00		
02/03*	2236 TRANS TERMINAL (80X24/0P60A)	177-2236-B		1	EACH	2,400.00	2,400.00	OK	
02/03*	2236MXD-1	177-2236-8		1	EACH	900.00	900.00		
02/03*	2260B-2 DUAL 10MEG DISK SYSTEM 20MG	177-2260-2		1	EACH	23,000.00	23,000.00		
02/03*	2261W 240 LPM WANG MATRIX PRINTER	177-2261-W		1	EACH	7,000.00	7,000.00	OK	
02/03*	2200 MVP 8CPU 32K MEMORY 9 I/O	177-3012		1	EACH	16,900.00	16,900.00		
02/03*	7042-A TRPL CONTROL MOD(EXT/PREL)	210-7042-A		1	EACH	0.00	0.00		
02/03*	FLOPPY CHASSIS & 1 DRIVE	270-0270-1		1	EACH	3,200.00	3,200.00	overpriced	
02/03*	FS-2 CABINET	279-8002		1	EACH	500.00	500.00		
02/03*	2230/60 DISK ENCLOSURE STAND	279-8003		2	EACH	125.00	250.00		
	INSIDE DELIVERY								
	PREVENT MAINT CONTRACT TO FOLLOW ON								

THIS IS NOT AN INVOICE

TOTAL

C	PACKER

LBS.	ZONE	WAYBILL #

SHIPPED VIA	FREIGHT	EXPORT INV. NO.

700-3871A - 1-77 - 20M - Printed in U.S.A.

* = ESTIMATED SHIPPING DATE

CUSTOMER

QUOTATION

No. WL

WANG LABORATORIES, INC.

ONE INDUSTRIAL AVENUE, LOWELL, MA. 01851, TEL. (617) 851-4111, TWX 710 343-6769, TELEX 94-7421

DATE OF QUOTATION 8-4-77

Requested Delivery Date: 6-8 Weeks A.R.O.

Please Send Purchase Order To:

TO

GEORGETOWN HARDWARE, INC.
6201 15th South
Seattle, Washington 98108

WANG LABORATORIES, INC.
200 West Thomas, Suite 106
Seattle, Washington 98119

GENTLEMEN: WANG LABORATORIES, INC. IS PLEASED TO SUBMIT TO YOU THE QUOTATION SET FORTH IN DETAIL BELOW.

Very truly yours,
WANG LABORATORIES, INC. Per Charles H Kemp

QUANTITY	DESCRIPTION		PRICE
1 each	Model 2200VP-8	Central Processing Unit with 32K Byte Memory and 9 I/O Slots	$ 11,200.00
1 each	Model 2260B-2	Dual 20 Megabyte Fixed/Removable Disk Drives	23,000.00
1 each	Model 2261W	240 LPM Matrix Line Printer	7,000.00
1 each	Model 2270-1	Diskette Drive 256K Byte	3,200.00
1 each	Model 2236	Interactive Terminal Keyboard/Display	2,400.00
1 each	Model 2236MXC-1	Terminal Controller Multiplexer	1,500.00
1 each	Model 2207A	I/O Interface Controller (RS-232-C)	600.00
1 each	Model FS-2	WCS Desk (Right Hand Work Space)	500.00
2 each	Model DE-1	Fixed/Removable Disk Enclosure	500.00
1 each	2200VP-8	Operational Software @ $60.00/month	
		UNLESS OTHERWISE STATED IN WRITING THIS QUOTATION IS GOOD FOR 30 DAYS. ALL AMOUNTS QUOTED ARE F.O.B. TEWKSBURY, MASS. AND ARE EXCLUSIVE OF STATE AND LOCAL TAXES. ALL QUOTATIONS INCLUDE TERMS AND CONDITIONS ON THE REVERSE SIDE HEREOF.	
/	ANNUAL PREVENTATIVE MAINTENANCE CONTRACT (PER MONTH)		401.00
		TOTAL	$ 49,900.00

We shall be pleased to supply any further information you may desire and trust that you will decide to favor us with this order which will receive our prompt and careful attention.

YOUR SIGNATURE BELOW AND ACCEPTANCE BY WANG LABORATORIES, INC. WILL CONVERT THIS QUOTATION TO A PURCHASE AGREEMENT WHICH INCLUDES THE TERMS AND CONDITIONS OF HARDWARE SALE PRINTED ON THE REVERSE SIDE HEREOF.

ACCEPTED: WANG LABORATORIES, INC.

CUSTOMER (Please Print)

BY: _____

SIGNATURE DATE

TITLE

ORIGINAL — RETURN TO VENDOR

Printed in U.S.A.
700-0041J
2-77-15M

QUOTATION

No. WL

WANG LABORATORIES, INC.

ONE INDUSTRIAL AVENUE, LOWELL, MA. 01851, TEL. (617) 851-4111, TWX 710 343-6769, TELEX 94-7421

DATE OF QUOTATION 8-4-77

Requested Delivery Date: 6-8 Weeks A.R.O.

Please Send Purchase Order To:

TO

GEORGETOWN HARDWARE, INC.
6201 15th South
Seattle, Washington 98108

WANG LABORATORIES, INC.
200 West Thomas, Suite 106
Seattle, Washington 98119

GENTLEMEN: WANG LABORATORIES, INC. IS PLEASED TO SUBMIT TO YOU THE QUOTATION SET FORTH IN DETAIL BELOW.

Very truly yours,
WANG LABORATORIES, INC. Per Charles H Kenyon

QUANTITY	DESCRIPTION		PRICE
1 each	Model 2200VP-8	Central Processing Unit with 32K byte Memory and 9 I/O Slots	$ 11,200.00
1 each	Model 2260B-2	Dual 20 Megabyte Fixed/Removable Disk Drives	23,000.00
1 each	Model 2261W	240 LPM Matrix Line Printer	7,000.00
1 each	Model 2270-1	Diskette Drive 256K Byte	3,200.00
1 each	Model 2236	Interactive Terminal Keyboard/Display	2,400.00
1 each	Model 2236MXC-1	Terminal Controller Multiplexer	1,500.00
1 each	Model 2207A	I/O Interface Controller (RS-232-C)	600.00
1 each	Model FS-2	WCS Desk (Right Hand Work Space)	500.00
2 each	Model DE-1	Fixed/Removable Disk Enclosure	500.00
1 each	2200VP-8	Operational Software One-time Charge	2,000.00
		UNLESS OTHERWISE STATED IN WRITING THIS QUOTATION IS GOOD FOR 30 DAYS. ALL AMOUNTS QUOTED ARE F.O.B. TEWKSBURY, MASS. AND ARE EXCLUSIVE OF STATE AND LOCAL TAXES. ALL QUOTATIONS INCLUDE TERMS AND CONDITIONS ON THE REVERSE SIDE HEREOF.	
/	ANNUAL PREVENTATIVE MAINTENANCE CONTRACT (PER MONTH)		341.00
		TOTAL	$ 51,900.00

We shall be pleased to supply any further information you may desire and trust that you will decide to favor us with this order which will receive our prompt and careful attention.

YOUR SIGNATURE BELOW AND ACCEPTANCE BY WANG LABORATORIES, INC. WILL CONVERT THIS QUOTATION TO A PURCHASE AGREEMENT WHICH INCLUDES THE TERMS AND CONDITIONS OF HARDWARE SALE PRINTED ON THE REVERSE SIDE HEREOF.

ACCEPTED: WANG LABORATORIES, INC.

CUSTOMER (Please Print)

SIGNATURE DATE

BY: _____

TITLE

ORIGINAL — RETURN TO VENDOR

Printed in U.S.A.
700-0041J
2-77-15M

WANG – WORLD LEADER IN CALCULATING/COMPUTING SYSTEMS

EQUIPMENT PURCHASE AGREEMENT

WANG
CALCULATORS/COMPUTERS
WORD PROCESSING SYSTEMS

DATE: 8-11-77 F.O.B. Tewksbury, MA
TERMS: SEE REVERSE

The purchaser agrees to buy and Wang Laboratories, Inc. agrees to sell the following equipment, subject to the Conditions of Sale specified on the reverse side.

BILL TO
GEORGETOWN HARDWARE, INC.
6201 15th South
Seattle, Washington 98108

SHIP TO
GEORGETOWN HARDWARE INC.
% [redacted] GENERAL MANAGER
550 INDUSTRY DRIVE
SEATTLE 98188

ITEM NUMBER	QUANTITY	CUSTOMER ORDER NO.	SHIPPED VIA	ESTIMATED DELIVERY	WANG TELEX I.D.
			Best Way	6-8 Weeks A.R.O.	

		DESCRIPTION	UNIT PRICE	NET PRICE	ANNUAL MAINTENANCE
1	1 ea	Model 2200VP-8 Central Processing Unit with 32K Byte Memory and 9 I/O Slots	$ 11,200 00	$ 11,200 00	$
2	1 ea	Model 2260B-2 Dual 20 Megabyte Fixed/ Removable Disk Drives	23,000 00	23,000 00	
3	1 ea	Model 2261W 240 LPM Matrix Line Printer	7,000 00	7,000 00	
4	1 ea	Model 2270-1 Diskette Drive 256K Byte	3,200 00	3,200 00	
5	1 ea	Model 2236 Interactive Terminal Keyboard/ Display	2,400 00	2,400 00	
6	1 ea	Model 2236MXC-1 Terminal Controller Multiplexer	1,500 00	1,500 00	
7	1 ea	Model 2207A I/O Interface Controller (RS-232-C)	600 00	600 00	
8	1 ea	Model FS-2 WCS Desk (Right Work Space)	500 00	500 00	
9	2 ea	Model DE-1 Fixed/Removable Disk Enclosure	500 00	500 00	
10		2200VP-8 Operation Software @ $50.00/month			
		CUSTOMER will accept partial shipment & pay for partial shipment			

FOR INFORMATION ONLY

IF FINANCING IS THROUGH A THIRD PARTY LEASE THIS SECTION IS TO BE FILLED OUT BEFORE THE ORDER IS SUBMITTED TO WANG LABORATORIES, INC.

LEASING CO. SEATTLE FIRST NATIONAL BANK LEASING CO.
ADDRESS
WANG LABORATORIES REPRESENTATIVE Charles H. Kemp
DISTRICT OFFICE

Cash Price Excluding Taxes (Net 30 days)	$	48,200 00
State and Local Tax	$	2,602 80
Maintenance Contract	$	*
☐ Less Deposit or ☐ Less 2% Cash with Order	$	
NET AMOUNT DUE	$	**50,802 80

☐ MILEAGE
☐ ADD'L SHIFT
☐ OTHER

*Maintenance is $391.00/month

**Net Amount Due plus $50/month Operational Software

CREDIT INFORMATION

SEATTLE FIRST LEASE
NAME OF BANK — ADDRESS
Bill Shaw (206) 583-6291
INDIVIDUAL TO BE CONTACTED — PHONE NO.

PLEASE ATTACH ADDITIONAL REFERENCES

SEE TERMS AND CONDITIONS OF SALE ON REVERSE

CUSTOMER (Please Print)
SIGNATURE — DATE
TITLE

ACCEPTED: WANG LABORATORIES, INC.
BY:

WANG LABORATORIES, INC.
ONE INDUSTRIAL AVENUE, LOWELL, MASSACHUSETTS 01851, TEL. (617) 851-4111, TWX 710 343-6769, TELEX 94-7421

Printed in U.S.A.
700-0636F
1-77-20M

CUSTOMER

TERMS AND CONDITIONS OF HARDWARE SALES

ACCEPTANCE:

All Purchase Agreements are subject to acceptance by the home office of Wang Laboratories, Inc., Tewksbury, Mass., (hereinafter "Seller"). Home office acceptance will be evidenced by Seller mailing to customer a form of order acknowledgement.

PRICES AND TAXES

Unless otherwise specified in writing by Seller all prices are F.O.B. the plant of Seller in Tewksbury, Massachusetts. All prices stated herein are subject to any addition which may be necessary to cover any tax or charge now existing or hereafter imposed by federal, state or municipal authority upon products or services herein described, or the production, sale, distribution, or delivery thereof, or under any feature of this transaction.

PAYMENT AND CREDIT

Each shipment shall be a separate transaction and payment shall be made accordingly. Unless otherwise agreed in writing, payment for products shall be made on the basis of net cash thirty (30) days from the date of shipment. If, in the exclusive judgment of Seller, the financial condition of the purchaser at any time does not justify the commencement or continuance of shipment on the terms specified herein, Seller may, in addition to all other remedies it may have at law or in equity, make a written demand for full or partial payment in advance, suspend its performance until such payment is made and cancel the customer's order if such payment is not received by Seller within thirty (30) days after delivery in person or mailing of said demand by Seller. If shipments are delayed by the purchaser, payment shall become due from the date when Seller is prepared to make shipment. Products held for the customer because of such delay in delivery shall be at the risk and expense of the customer.

If customer fails to pay any charges when due and payable, customer agrees that Wang will have the right to invoice and customer will pay a late payment charge of 1.5% per month, but not in excess of the lawful maximum, on the unpaid balance.

PROGRAM PRODUCT LICENSES

Any program products (software) listed on this Purchase Agreement are not sold and ownership of or title to program products does not pass to customer. Customer purchases only a non-exclusive license to use the program products (software ıd accepts the terms and conditions of the license as set forth in the standard Wang Program Product License and Service Agreement.

DEFAULT

If the customer fails to pay any amount due Wang, or breaches any of the terms of this agreement, Wang may, in addition to any other legal remedies it may have, discontinue all service of the equipment, including warranty service, service under a maintenance contract or any other type of service. Customer also agrees to pay Wang's costs and expenses of collection including attorney's fees up to the maximum permitted by law.

SHIPMENTS AND DELIVERY

Unless otherwise specified in writing by Seller, delivery of products shall be F.O.B. Tewksbury, Massachusetts. Title and risk of loss or damage to goods shall pass from Seller to the customer upon delivery by Seller to the possession of the carrier. Any claims for loss or damage after risk of loss has passed as herein provided shall be filed with the carrier.

Shipping dates are approximate. Seller shall not be liable for loss or damage from delay in delivery due to causes beyond its reasonable control. In the event of such delay in delivery, Seller shall not be required to allocate deliveries among customers.

Customer hereby grants Seller a security interest in the products and proceeds (including Accounts Receivable) thereof if any, as security for all its obligations hereunder.

WARRANTY

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The foregoing responsibilities of Wang shall apply only if its products are used in accordance with Wang Laboratories, Inc. instruction manuals and recognized standards of care, and may be modified only in writing by a document signed by an officer of Wang Laboratories, Inc.

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The Wang Laboratories, Inc. units, products or systems specified on this document may contain some components which have been remanufactured after previous field utilization. This is primarily necessitated by material and component shortages. In addition, Wang Laboratories, Inc. actively participates in efforts to conserve the resources of this country, both within its organization and in its products.

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CONSEQUENTIAL DAMAGES

In no event shall Seller be liable for incidental or consequential damages in connection with or arising out of the furnishing, performance or use of any product covered by this sales contract.

MISCELLANEOUS

The validity, construction and interpretation of this sales contract and the rights and duties of the parties hereto shall be governed by the laws of the Commonwealth of Massachusetts. This sales contract constitutes the entire understanding between Seller and the purchaser and contains the final, complete and exclusive statement of representation made by Seller. Seller shall not be bound by any representation, promise or inducement of any kind unless set forth herein, nor shall it be bound by any representation made herein except to the purchaser

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All drawings, designs, techniques and improvements (whether patentable or unpatentable) made or conceived by Seller or its agents or employees in the fulfillment of this sales contract shall be the property of Seller and the customer agrees not to use for its own benefit or disclose to or use for the benefit of any other person any of such property. The customer may not assign his rights or duties under this sales contract, including the right to benefit from the warranty contained herein without the prior written consent of Seller, which consent shall not be unreasonably withheld. However, customer may assign his title to and rights in equipment covered by the agreement to any assignee who has previously been authorized in writing by Seller to receive said assignment.

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