

**WANG**

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## DATA SHEET

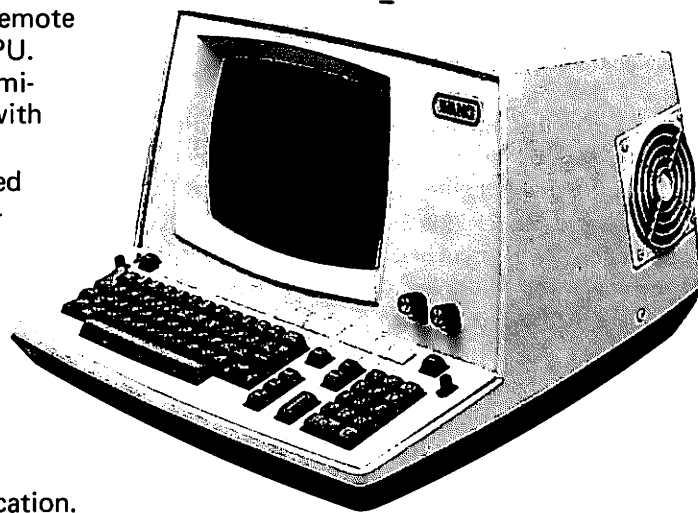
With the Model 2236 Interactive Terminal and Model 2236MXC Multiplex Controller, Wang Laboratories can provide extremely cost-effective multi-terminal networks for business applications where up to eight terminals (local, remote, or mixed) are controlled by an application program residing in a 2200 Series central processor. Applications well-suited to such networks include interactive inquiry/response, data entry/validation, data base update, and forms filling for businesses performing such tasks as credit verification, order entry, invoice form preparation, and inventory inquiry.

**Multi-terminal Configurations**

A single Wang 2200 Series Central Processing Unit (CPU) equipped with a Model 2236MXC Multiplex Controller can control a network of up to either four or eight 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 2200T CPU. For applications where extensive processing must occur between operator entries, the 2200VP CPU is recommended to increase overall performance. For applications where five to eight Interactive Terminals are needed, a Wang 2200VP is required. In all cases, the multi-terminal network is controlled by a single BASIC Language program residing in the 2200 CPU.

Each Interactive Terminal can be located in a local, extended local, or remote environment relative to the 2200 CPU. If desired, Teletype<sup>®</sup> equivalent terminals may be included in a network with Wang Interactive Terminals.

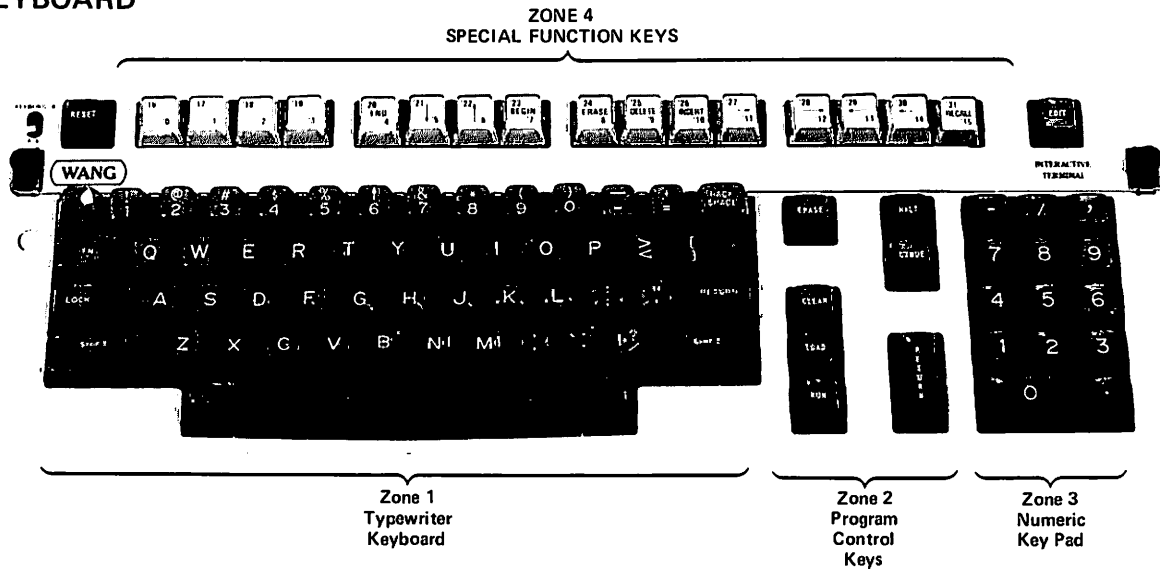
One Model 2236 terminal, installed as the "primary terminal" for a network, performs all system initialization operations and program entry, when required, thereby eliminating the need for a console device such as the Model 2226 CRT/Keyboard Console. Moreover, the primary terminal also can perform any operations associated with the multi-terminal application.



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# MODEL 2236 INTERACTIVE TERMINAL & MODEL 2236MXC MULTIPLEX CONTROLLER

## 2236 KEYBOARD



One disk or diskette drive must be available for application program loading; however, once a program has been loaded, the drive is accessible to all terminals for data storage and retrieval, as are any additional disk/diskette drives or 9-track tape drives in a network. Wherever required, a Wang printer may be plugged into an Interactive Terminal to provide hardcopy output.

### OVERVIEW

Coordination of terminal polling functions, display of operator-prompting messages at each terminal, and transfer of complete data entry fields to the CPU are handled by the microprocessor-based Model 2236MXC Multiplex Controller in conjunction with the BASIC Language program in CPU memory. The Multiplex Controller provides a full overlap capability by receiving and buffering keyed data from the terminals while the CPU processes previously buffered data.

Polling and display controls, including cursor positioning, are supported by the Wang-supplied Terminal Access Method (TAM) subroutines, which can be efficiently incorporated into user-supplied BASIC Language application programs.

The Model 2236MXC Multiplex Controller contains separate input and output buffers for each terminal, and supports full-duplex asynchronous communication with each Teletype-equivalent or Wang Interactive Terminal at speeds up to 9600 baud. Two independent communication channels are associated with each terminal; one channel transfers keyed characters to the input buffer, while the other channel transfers output buffer information, including "echos" of keyed characters, and program-generated display output and printer output. The combination of independent buffering and high-speed full-duplex communication allows uninterrupted keying with simultaneous display at each Interactive Terminal in a multi-terminal network.

### MODEL 2236 INTERACTIVE TERMINALS

Wang's Model 2236 Interactive Terminal contains a 12-inch (30.4 cm) diagonal measure Cathode Ray Tube (CRT) screen for operator prompting and verification, and a typewriter-arranged keyboard with a separate numeric keypad for operator-keyed input. Control functions are handled by several types of function keys.

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 above picture. A keyboard clicker provides audio feedback when a key is touched with sufficient pressure to ensure entry of a character. An experienced typist need not "bottom out" a key to ensure entry, thereby increasing input speed and lessening the need to verify entry by checking the CRT.

The CRT has a 24 line, 80 character per line capacity (1920 character positions) for full-screen operator prompting and validation of keyed characters. Brightness and contrast controls provide a sharp, clear image on the screen. Display speed is approximately 1,000 characters per second at 9600 baud.

The display and keyboard support both upper and lowercase alphabetic characters. Formatted displays providing operator "prompts" and defined entry fields are easily programmed using Terminal Access Method (TAM) Subroutines, which support cursor positioning as well as the display of default values in entry fields.

A program-controlled audio alarm can minimize operator monitoring by signaling when special conditions occur.

Any standard Wang printer may be plugged into the printer connector on an Interactive Terminal. The Wang-supplied direct-connection cable or an optional modem cable plugs into the RS-232-C compatible connector.

## MODEL 2236MXC MULTIPLEX CONTROLLER

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 in a 2200 T or VP CPU. The Model 2236MXC-2 supports up to eight Interactive Terminals using two I/O slots in a 2200VP CPU.

The Multiplex Controller, and thus the Interactive Terminals, are programmable via Terminal Access Method (TAM) subroutines incorporated into user-written BASIC Language programs. Terminal polling, using TAM, is usually performed on an equal priority basis; however, TAM allows timing priorities among the terminals. TAM also provides display control functions and transfers keyed messages of up to 80 characters to the user's program.

## COMMUNICATION SPEEDS AND CONNECTIONS

Line handling between the Multiplex Controller and each Interactive Terminal is asynchronous full-duplex at up to 9600 baud. The four or eight plugs on the Multiplex Controller and one plug on the Interactive Terminal are 25-pin, RS-232-C compatible. Each Interactive Terminal can be situated in a local, extended local, or remote environment relative to the 2200 CPU and Multiplex Controller. 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 (7.6 m), transmission rates of 9600 baud occur with direct four-wire connection using a Wang supplied cable. For cable distances beyond 25 feet, up to 1,000 feet (304.8 m), optional cables are available in 100-foot (30.5 m) increments to provide direct extended local connection at speeds of 9600 baud.

For cable distances beyond 1,000 feet, asynchronous, full-duplex, RS-232-C compatible modems must be used to provide the communication link. Two modems per terminal are required. One modem is connected to a plug in the Multiplex Controller; the other is connected to an Interactive Terminal or Teletype Terminal. For distances up to 5 miles (8 km), short-haul modems may be employed using private four-wire connection between modems. For distances exceeding 5 miles (8 km), telephone lines (switched networks) or private lines provide the connection between two telecommunication modems.

For modem connections, Multiplex Controller baud rates (all factory-wired at 9600 baud) may be set upon installation at either 300, 600, 1200, 2400, or 4800 baud by a Wang Service Representative for any terminal. Although each Interactive Terminal's baud rate is manually selectable, its rate must equal the baud rate set at the Multiplex Controller plug to which the terminal is connected.

Cable is optionally available for modem connections to Wang equipment at 12 feet (3.7 m), with optional extensions of 25 feet (7.6 m), and 50 feet (15.2 m). 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 . . . . .	19¼ 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. (0.41 cm)
Width . . . . .	0.09 in. (0.23 cm)

### Power Requirements

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

### Fuses

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

### Transmission Rate

Manually selectable at 300, 600, 1200, 2400, 4800, or 9600 baud.

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

## 2236MXC SPECIFICATIONS

### Operating Environment

Same as 2200 CPU.

### Power Requirements

Supplied by the CPU.

# DATA SHEET

## 2236 MXC SPECIFICATIONS (Cont.)

### 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).

### Communications Modes

Full-Duplex Asynchronous Wang mode for Model 2236 Interactive Terminals.

Full-Duplex Asynchronous Teletype mode for non-Wang, RS-232-C compatible, Teletype-equivalent terminals.

### Asynchronous Character Format Options

Parity: odd, even, or none.

Number of Data Bits: 5, 6, 7, or 8.

Number of Stop Bits: 1, 1.5, or 2.

One Start bit (standard).

### Non-Wang Terminal Requirements

An RS-232-C compatible, Teletype-equivalent terminal must (1) have a 25-pin RS-232-C compatible plug, (2) communicate at one of the Multiplex Controller's transmission rates, and (3) use one of the Multiplex Controller's software-selectable asynchronous communication character formats.

A non-Wang terminal may use the same cable as a Wang Interactive Terminal.

### Transmission Rate

For each plug, independently of the other plugs on the Multiplex Controller, the rate may be set by a Wang Service Representative to 300, 600, 1200, 2400, 4800, or 9600 baud.

### ORDERING SPECIFICATIONS: INTERACTIVE TERMINAL

A terminal with 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 terminal. Program control keys must also be provided, because one Wang Interactive Terminal must serve as the CPU control console for a multi-terminal network.

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

### ORDERING SPECIFICATIONS: MULTIPLEX CONTROLLER

The Model 2236MXC Multiplex Controller must be compatible with 2200VP and 2200T 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 216-byte input buffer and separate output buffers for display and printer purposes. For modem use, it must provide speeds at either 300, 600, 1200, 2400, 4800, or 9600 baud for any 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.

*Standard Warranty Applies*

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

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