WANG

3275 BSC Emulator User Manual

SYSTEM 2200

3275 BSC EMULATOR USER MANUAL

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PREFACE

Wang's 3275 BSC Emulator facilitates communications between a Wang system and host computers which support IBM 3275 Display Stations (Model 2) for applications including data entry, order entry, inquiry/response, and inquiry with data base update. The software resides on a diskette (#701-2356), available in the 3275 Emulator Package (#195-0048-3) which also contains a copy of this manual.

The general information in Chapter 1 includes a discussion of the Wang equipment and the user-supplied modem necessary for operation of the software. Chapter 2 contains operating instructions to be used in conjunction with information which must be supplied by the host data center supporting communications with the Wang system.

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CHAPTER 1

GENERAL INFORMATION

1.1 SOFTWARE OVERVIEW

Wang's 3275 BSC Emulator, in conjunction with a communications controller, allows a Wang system with a 2200T, VP, or MVP central processor to emulate an IBM 3275 Display Station (Model 2)* with or without a 3284 Printer (Model 3)**. The software facilitates communications between the Wang system and host computers which store data under Information Management System (IMS), Customer Information Control System (CICS), or other programs accessible by the 3275 BSC protocol. Features of the software include the following:

- 1,920-character display capability, using any Wang 24-line by 80-characters-per-line cathode ray tube (CRT) screen
- emulation of the unbuffered, 40-characters-per-second printing capability of a 3284 Printer (Model 3), using any Wang printer
- information handling by the Wang system and its operator on a field-by-field basis in accordance with the host-supplied attribute byte for each field (an attribute byte defines the characteristics of the field's contents)
- screen formatting, field checking, and field protection corresponding to the attribute bytes for the displayed data
- transmission on a record/block basis using the BSC point-to-point contention protocol over dial-up or nonpolled leased lines
- a line speed of 1200, 2000, 2400, or 4800 bits per second (bps), depending upon the modem used with the controller.

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* There are four IBM 3275 display station models: Models 1 and 2, designed for Binary Synchronous Communications (BSC) procedures, plus Models 11 and 12, designed for Synchronous Data Link Control (SDLC) procedures. Models 1 and 11 have a 480-character screen capacity; Models 2 and 12 have a 1,920-character capacity.

** There are three 3284 printer models. Models 1 and 2 have 480-character and 1,920-character print buffers, respectively. Model 3 has no print buffer; it attaches to a 3275 display station and uses its buffer.

1.2 CPU AND PERIPHERAL REQUIREMENTS

To support the 3275 software, a Wang system must include the following equipment:

- A 2200T central processor with 16K bytes of user memory or, preferably, either a 2200VP or 2200MVP central processor with 17K bytes of user memory.
- A Model 2228C Synchronous/Asynchronous Communications Controller installed in the central processor. (If a system is already equipped with a Model 2228B controller, that controller may be traded in towards a Model 2228C controller which supports all software packages supported by the Model 2228B controller.)
- A user-supplied modem to provide an interface between the communications controller and a dial-up or nonpolled leased line. (See Section 1.3.)
- A diskette drive. (The software is distributed on a single diskette.)
- A 24 X 80 CRT to provide the full 1,920-character screen capacity of the 3275 Display Station, Model 2. (Neither the 480-character capacity of the 3275 Display Station, Model 1, nor the Wang 16 X 64 CRT is supported by the software.)
- Any Wang printer.

1.3 MODEM CONSIDERATIONS

A modem is needed for communications with a remotely located host system since signals from the Wang system must be converted (modulated) into a range of frequencies suitable for transmission over telephone lines. Similarly, signals received via telephone lines must be demodulated before transfer to the Wang system.

The modem used with a Wang system may be rented from the telephone company serving the locality where the system is installed or may be purchased from any one of several modem vendors. However, in either case, arrangements with the telephone company may be necessary if connection is to be made to a common carrier network.

Before a telephone company or a modem company representative arrives to install a modem, the location of the Wang system must be known (or in the final planning stage) to ensure its proximity to any telephone equipment to be used for communications with a host system. When modems are wired permanently to a wall, subsequent relocation of the Wang system any great distance necessitates relocation of the modem.

Compatible Modems for the 3275 Software

Short haul modems may be used for connections up to 25 miles (40.2 km) over nonpolled, private lines. For connections over common carrier telephone lines, the following modems may be used:

Modem (Bell type or equivalent)	Line Speed
212A	1200 bps (with restrictions)
201A	2000 bps
201C	2400 bps
208A	4800 bps (nonpolled leased line)
208B	4800 bps (dial-up line)

Usually, modems which support higher line speeds are more expensive; however, expense is not the only criterion to use when choosing a modem. A modem must be compatible with the host system's communications requirements, also. For example, although Wang's 3275 software supports use of a Bell 212A modem (strapped for synchronous, internal timing at 1200 bps), this modem operates only in the full duplex mode and is not suitable for a host system which requires half duplex operation. If a host system requires active Request to Send (RTS) and Clear to Send (CTS) modem signals, the continuous CTS signal presented by the 212A modem is not acceptable.

Sometimes a facility has several telephone numbers representing separate lines for communications, but the modem characteristics and line speeds associated with these telephone lines may differ. The Wang system user who is responsible for coordinating communications with a particular facility should determine which telephone numbers are appropriate, and these numbers should be posted near the Wang system for the convenience of other users who may need to communicate with the host system.

> NOTE:
>
> Modems used at both ends of a communications line must have the same characteristics, including the line speed. Do not expect to communicate with a remotely located host system if the modem connected to the Wang system is not compatible with the 3275 software and the remote system.

1.4 SOFTWARE BACKUP

Before attempting to use the 3275 software for the first time, copy the software to another diskette and carefully label the duplicate platter. Use of duplicate software ensures that the master software received from Wang Laboratories is always available as a backup system.

Instructions for copying the contents of one platter onto another platter, if both platters are mounted in a dual drive unit, are given in the Disk Reference Manual supplied with Wang systems. (See the COPY statement.) Also, Wang's Integrated Support System (ISS) software includes a utility which can be used to copy the 3275 software to a disk cartridge, if desired.

1.5 CUSTOMIZING THE SOFTWARE

The 3275 software diskette contains a source code module documented with REM statements for the convenience of experienced BASIC language programmers or Wang system vendors who may wish to create a customized version of the 3275 software. This module is named EM3270S. Remember, however, that modifications to the software become the responsibility of the person who modifies the software; such modifications are not supported by Wang Laboratories.

CHAPTER 2

OPERATING INSTRUCTIONS

2.1 INTRODUCTION

The general applications performed by 3275 display stations include the following: data entry, order entry, inquiry/response, and inquiry with data base update. While performing such functions, a 3275 display station communicates with a host system under its control.

Since a 3275 display station cannot function independently, it becomes effective primarily for offices where extensive access to a host system is required. On the other hand, a Wang system with the 3275 emulation software becomes effective for offices where local processing capability is a primary need and interaction with host computers is a secondary need.

When communication with a host system is desired, the Wang system user loads the 3275 software into memory and establishes a connection with the host using the procedures described in this chapter. While the Wang system is online to the host system, several keys on the keyboard have new meanings and provide special functions associated with the 3275 protocol. The CRT is formatted into protected and unprotected fields, determined by the application program operating in the host system. In typical 3275 programs, several fields may be highlighted when displayed; however, dual intensity screen displays are not implemented by the 2200T, VP, or MVP central processors. Instead, the 3275 software optionally provides a special symbol (a diamond) to mark each highlighted field presented by the host system; this feature is easily enabled or disabled by the operator using one of the specially defined keys. Cursor positioning is controlled by the application program and optionally by the operator.

All the special functions and operator controls for Wang's 3275 software are described in this chapter. This information should be used in conjunction with operational information which must be provided by the host data center supporting 3275 BSC communications with the Wang system.

2.2 LOADING THE SOFTWARE

To load the software, mount the diskette containing the 3275 Emulator on the F drive; then, proceed as follows:

1. Key CLEAR and RETURN.

2. Enter SELECT DISK xyy (replacing xyy by the proper address, usually 310) and key RETURN.

3. Enter LOAD DC F "START" and key RETURN; then, key RUN and RETURN--or, if using a system with Wang's BASIC-2 instruction set, key LOAD RUN.

A "loading message" appears on the CRT while the 3275 Emulator is being loaded. No operator action is necessary until either a prompt appears or the screen becomes blank.

If the software is being loaded for the first time, another message prompts the operator to supply the following information:

1. the terminal ID (see Section 2.3) and

2. the CPU type (T, VP, or MVP).

After this information is supplied, it is saved on the software platter; then, the software is automatically reloaded and the screen becomes blank.

When the screen becomes blank, the operator should establish a connection with the host system (see Section 2.4). Meanwhile, the screen remains blank until formatted in accordance with the field attribute codes sent by the host system.

2.3 SPECIFYING THE TERMINAL ID

The terminal ID is not an arbitrary input value for the 3275 software; it is a unique code assigned by the host data center. Therefore, prior to attempting to communicate with a host system not previously accessed by the 3275 emulation software, request an ID number from the data center personnel. The number should have eight hexdigits, with 86 as the leading digits. If no ID is required by the host, set the ID value to "32323232" for the 3275 software.

Normally, the terminal ID is set only once at installations where the 3275 software is used for communications with only one host system. If necessary, the terminal ID may be reset at any time after loading the software (or during its execution) by keying SF'29 (Set Terminal ID).

2.4 ESTABLISHING A CONNECTION

When the CRT becomes blank after the software is loaded, the operator normally dials the telephone number of the host system unless the Wang system is connected to a single host system and no telephone is involved. After dialing a host system, listen for a ringing sound or busy signal. When a high-pitched sound interrupts the ringing sound, depress the DATA button on the modem telephone and key ENTER on the Wang keyboard. The software then transmits the terminal ID to the host.

The host system usually responds by requesting a signon message from the Wang system. Like the terminal ID, the signon message and its precise format are prescribed by the host data center. Unless a correct signon message is transmitted, further communication with the host system is impossible.

2.5 SCREEN FORMATS AND SPECIAL CONDITIONS

After the operator establishes a connection with the host and properly signs on, the host sends field attribute codes which determine the screen format for displayed data from the host (these codes also control data entry and its image display). At this time, the keyboard is unlocked and the operator may input information for the unprotected (modifiable) fields displayed by the host. The cursor may appear at the beginning of the first modifiable field on the display or at the bottom of the display, depending upon the host's program. Also, the host may highlight unprotected or protected fields. Each highlighted field is denoted on the Wang CRT by a diamond (◆) placed at the beginning of the field if the highlighting feature is enabled. Initially, the highlighting feature is disabled; however, as indicated in Table 2-1, the EDIT key may be used to enable or disable the highlighting feature, as preferred.

During normal 3275 communications, the host system locks and unlocks the keyboard. When the host locks the keyboard, Wang's 3275 software displays a "KEYBOARD LOCKED" message in the lower right corner of the CRT. If the host fails to unlock the keyboard, the operator may do so by pressing Special Function key '0 (3275 Reset). Remember, however, that the keyboard may become locked (without a message displayed on the screen) when the printer is busy under the following circumstances:

- The host has sent data to the printer (perhaps indicated by a message) but no printing is occurring--if so, select the printer if not currently selected.

- The printer is printing but a new screen display has appeared--if so, intermittently try the keyboard until it becomes active again. (A temporary keyboard lock may be imposed by the Wang software to eliminate problems which could arise if data entry overlaps the initial phase of the printing operation.)

2.6 SPECIAL 3275 EMULATION KEYS

When the 3275 software is loaded into memory, some keys are assigned unique functions related to 3275 communications. Table 2-1 lists these Wang keys in the first column, the corresponding 3275 key or function in the second column, and a description of the function in the third column. Also, Figure 2-1 shows the keyboard layout for Wang's Model 2226 Console (used with the 2200T and VP central processors) and includes suggested overlays to aid an operator during 3275 emulation. With two exceptions, as noted in Table 2-1, these overlays apply to identically named keys on a Model 2236D Interactive Terminal used with a 2200MVP central processor. Figure 2-2 diagrams special function strips for 3275 communications with a host system. One function strip is appropriate for the 2226 keyboard, and the other for 2236D keyboards.

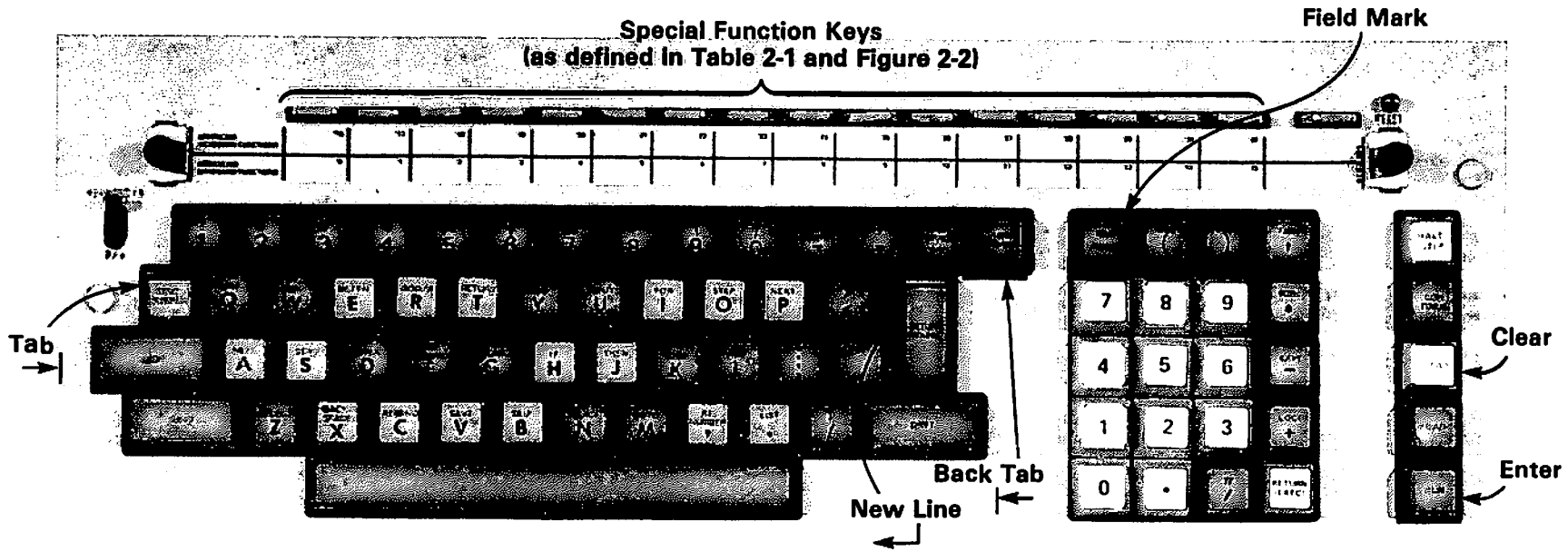
Table 2-1. Special 3275 Emulation Keys

Wang Key	3275 Function	Description
RUN	ENTER	Sends a filled screen to the host.
CLEAR	CLEAR	Clears the entire screen and notifies the host.
STMT NUMBER or FN (on MVP)	→| (Tab)	Tabs the cursor to the next unprotected field. (Note: The Wang key depends upon the keyboard in use.)
LINE ERASE	|← (Back Tab)	Tabs the cursor to the beginning of either the current or the previous field.
RETURN	←┘ (New Line)	Moves the cursor to the first unprotected field on the next line.
PRINT or CONTINUE (MVP)	FIELD MARK	Generates a field mark. (Note: The Wang key depends upon the keyboard in use.)
EDIT	Highlighting	Enables the highlighting feature (if disabled) or disables it (if enabled). When enabled, a diamond (◆) precedes each highlighted field; when disabled, no diamonds appear. (Note: Initially, this feature is disabled; otherwise, only the presence or absence of diamonds reveals whether highlighting is currently enabled or disabled.)
SF'0	RESET (3275 Reset)	Terminates the insert mode, if active, or disables a keyboard locked condition. (Note: Do not use the Wang Reset button.)
SF'1, SF'2, SF'3	PA1, PA2, PA3	Each Program Attention (PA) key sends only a code to request program action--codes may differ at each installation.
SF'4 - SF'7, SF'16 - SF'23	PF1, PF2, PF3, ..., PF12	Program Function (PF) keys are similar to PA keys, but each PF key sends both a coded request and the screen data.
SF'8	ERASE INPUT	Erases all unprotected fields. (Note: Software search time may produce a few seconds delay, depending upon the number of fields being erased.)
SF'9	DEL (Delete)	Deletes the character at the current cursor position and shifts the remainder of the field to the left.

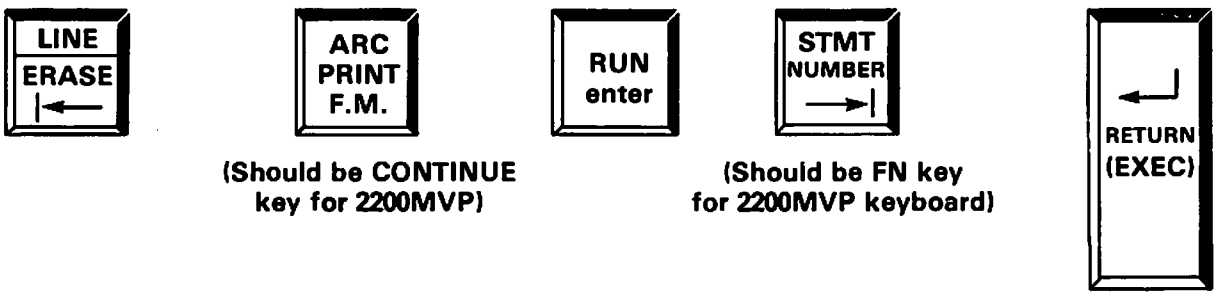
(Table 2-1 is continued on the next page.)

Table 2-1 (Continued). Special 3275 Emulation Keys

Wang Key	3275 Function	Description
SF'10	INS MODE (Insert)	Activates the insert mode, allowing characters to be inserted in a field in front of the current cursor position. (SF'0 terminates the mode.)
SF'11	↑ (Cursor up)	Moves the cursor up one line, regardless of the field formats.
SF'12	→ (Cursor right)	Moves the cursor one position to the right, regardless of the field format.
SF'13	← (Cursor left)	Moves the cursor one position to the left, regardless of the field format.
SF'14	↓ (Cursor down)	Moves the cursor down one line, regardless of the field format.
SF'15	DUP (Duplicate)	Generates a unique dup character which is interpreted by the host.
SF'24	ERASE EOF	Erases characters from the current cursor position to the end of the field.
SF'25	_	Generates an underscore (_).
SF'26	¢	Generates a cent sign (¢).
SF'27	|	Generates a vertical bar (|).
SF'28	¬	Generates a not sign (¬).
SF'29	Set Terminal ID	Interrupts the 3275 emulation and prompts the operator to supply an ID and the CPU type (T, VP, or MVP). The ID, obtained from the host, always consists of eight hexdigits--beginning with "86"; if no ID is required by the host, set the ID to "32323232". The ID and CPU responses are saved on the software platter, and the emulation is automatically reloaded.
SF'30	Restart	Reloads the start module prior to establishing another connection. (Note: Since the ID is transmitted just once after the software is loaded, this key is useful when establishing a second connection.)
SF'31	TEST REQ (Test Request)	Sends a special function which is interpreted by the host.

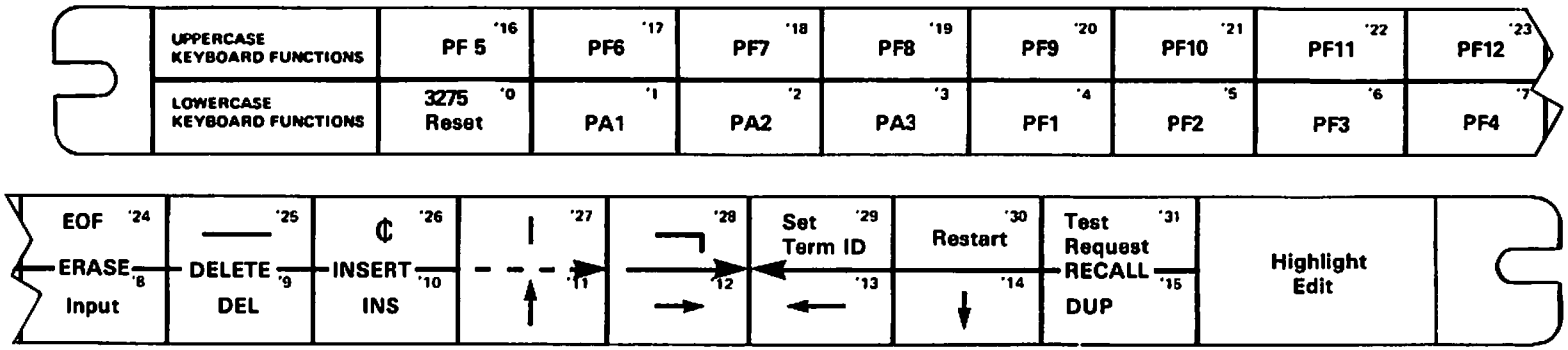


3275 Emulation Keyboard Layout for a Model 2226 Console
Used with 2200T and 2200VP Central Processors

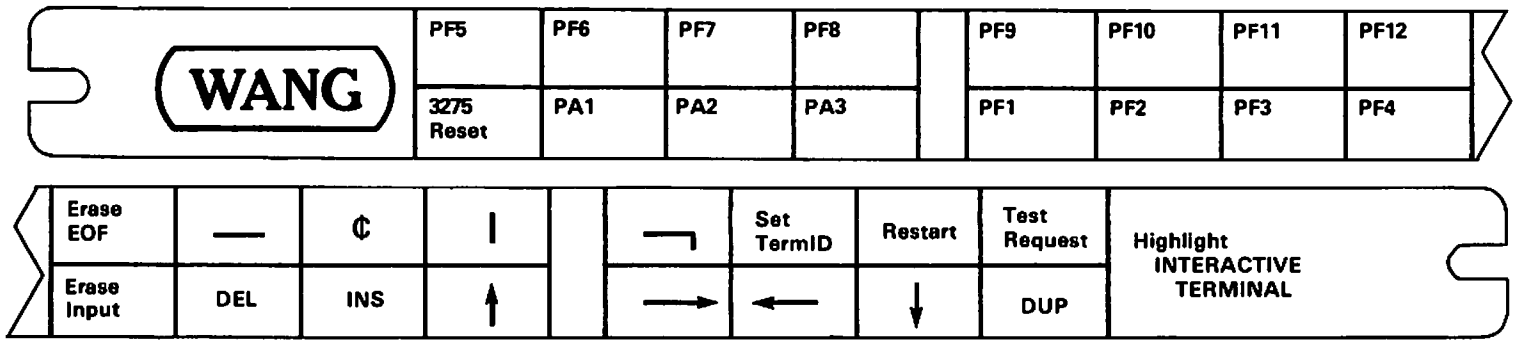


Suggested Overlays for Special Keys

Figure 2-1. Wang Keyboard Layout for 3275 Emulation



3275 Function Strip for Model 2226 Console
Used with 2200T and 2200VP Central Processors
(Tape the two sections together end-to-end)



3275 Function Strip for Model 2236D Terminal
Used with 2200MVP Central Processors
(Tape the two sections together end-to-end)

Figure 2-2. Special Function Strips for 3275 Emulation

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