AT&T

AT&T 3270 Emulator +
User's Guide

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1 Introduction

Overview

The AT&T 3270 Emulator+ is a networking software product that supports interactive communication between your 3B Computer and a host system. The AT&T 3270 Emulator+ software performs the functions of the following IBM devices:

- IBM 3274 Control Unit (BSC/3270 and SNA/3270). Commands supported include:

  - Copy (BSC only)

  - Erase All Unprotected

  - Erase/Write

  - Erase/Write Alternate

  - Read Buffer

  - Read Modified

  - Read Modified All

  - Write

- IBM 3278 Display Station, Models 2 and 5

- IBM 3279 Display Station, Model 2

Your System Administrator handles the operations of the 3274 Controller emulation and the 3287 Printer emulation for your 3B Computer. For more information, refer to the *AT&T 3270 Emulator+ System Administrator's Guide*, or consult your System Administrator. This book deals with 3278/9 Terminal emulation.

3278/9 Features

The AT&T 3270 Emulator+ software that allows you to use your terminal as an IBM 3278/9 Display Station is called the 3278/9 Terminal Emulator. The emulator allows communication between your terminal and a host computer, and it allows you to use all the features and programs available to the user of a 3278/9 Display Station. Using the AT&T 3278/9 Terminal Emulator you may:

- Log on to IBM mainframe applications such as TSO, IMS, and CICS.

- Send a copy of a screen display (local screen print) to a 3B Computer file or pipe it to a process, such as the printer spooler, **lp**.

- Direct host application program output to a UNIX system printer queue, file, or process.

The 3278/9 Terminal Emulator supports all the features of the 3278 Display Station (Models 2 and 5) and the 3279 Display Station (Model 2), including:

- Base color (white, blue, green, and red)

- Extended color (turquoise, pink, and yellow)

- Extended highlighting (blink, underscore, and reverse video)

- 132 column mode (Model 5)

In addition to these standard features, the 3278/9 Terminal Emulator offers the following enhancements:

- Multi-session capability - up to 4 independent sessions can be established with one or more hosts from a single terminal.

- All 3278/9 Terminal Emulator session management functions may be invoked from a user-friendly Terminal Function Selection Menu as well as from the sessions themselves.

The 3278/9 Terminal Emulator

The primary functions of the 3278/9 Terminal Emulator are to:

- Update the screen buffer and screen display based on application program data received from the host

- Process and display your keystrokes

- Format the screen buffer to be sent to the host

- Send a copy of the screen to a local printer or disk file when you press the Terminal Emulator's PRINT key.

The 3270 Emulator+ software is designed to work with many different types of terminals. For each terminal supported there is a keyboard mapping file and a screen control file that tell the 3278/9 Terminal Emulator how that particular terminal's keyboard and screen capabilities are to be translated to the 3278/9 functions. Because this configuration information is in a file, it is not fixed and can be adjusted to suit your needs. If after using the emulator for awhile, you feel that the keyboard and screen functions could be used more efficiently in a different configuration, you should ask your System Administrator to customize your keyboard and/or screen accordingly. Note that some of the 3278/9 features, such as extended highlighting and color, can only be emulated if your terminal physically supports them.

Customized files for the following terminal types are provided by the AT&T 3270 Emulator+:

- AT&T 4410, 4418, 4425, 605, 610, 615, 620 and 630

- Teletype 5410, 5418, 5425

- Hewlett-Packard 2621

- Lear-Siegler ADM-3a

- Televideo 910, 924

- DEC VT-100

- Tektronix 4105A

Note that:

- The AT&T 4418 and the Teletype 5418 keyboard layouts are the same as that of an IBM 3278.

- The AT&T 4425 and the Teletype 5425 screen and keyboard files support 132 column mode (Model 5).

- The Tektronix 4105A screen and keyboard files support all features except 132 column mode (e.g. base and extended highlighting).

- The AT&T 620 and 630 Terminals do not support extended attributes.

- The AT&T 630 Terminal does not support bold (different character intensities).

| NOTE | If your terminal is not listed above, ask your System Administrator to create the customized files needed for your terminal type. |

Using the AT&T 3287 Printer Emulator

Your System Administrator handles the operation of the AT&T 3287 Printer Emulator; before you can use it, your System Administrator must start the Printer Emulator process. The AT&T 3287 Printer Emulator allows you to use a host application print command or utility to direct output or files to a UNIX system file or to a process such as the printer spooler, **lp**.

Your System Administrator can tell you how to use these remote print facilities and where your print jobs will appear.

2 3278 and 3279 Key Functions

Introduction

For descriptive purposes, the keys on a 3278 or 3279 Display Station keyboard can be categorized as follows:

- communication-specific keys

- printer-specific keys

- termination keys

- status line keys

- local keys

- multi-session keys

IBM 3278/9 Display Stations have a number of keys that are not found on the ASCII terminals used with the 3B Computer. These keys are implemented on your terminal using special key combinations that simulate the IBM key functions. The following pages discuss each of these key functions as well as the multi-session keys used with the 3278/9 Terminal Emulator. Because many of the features described in this section are specific to a 3278/9 Display Station, and have special characteristics when they are used in a 3270 environment, you may wish to familiarize yourself with a real IBM 3278 or 3279 terminal. For more information about the IBM 3278 or 3279 Display Station, see the list of publications in Appendix A.

Appendix C contains several tables listing the key sequences used to emulate the 3278/9 capabilities for each supported terminal type.

Communication-Specific Keys

The following key capabilities are used to communicate with the host system. During communication with the host, your terminal is locked and the system message WAIT appears in the Operator Information Area of your screen. (The Operator Information Area is described in Chapter 3, Screen Display.)

ATTN

Use ATTN when you want to communicate with the application program to request permission to transmit data. ATTN requests that the application program stop transmitting and unlock the terminal keyboard. The emulator key sequence functions only during an AT&T 3270 Emulator+ session between the terminal and the application program. When you use ATTN, the screen is cleared.

CLEAR

Use CLEAR to clear the screen and "home" the cursor (i.e. position it at the top, left-hand corner of the screen). In SNA mode, the CLEAR key is active in sessions with the network control program or with the application program. In BSC mode, CLEAR is active only when the terminal is unlocked.

CURSR_SEL

CURSR_SEL is active only on fields that have been defined as detectable by a light-pen.

- If the information at the current cursor position is part of a light-pen detectable Selection field, using CURSR_SEL in that field will toggle the designator character for that field between "selected" (>) and "not selected" (?). Then, pressing ENTER sends the contents of all modified fields, including the light-pen detectable fields, to the host. The light-pen detectable fields that have been selected are considered modified fields since selecting such a field sets the modified data tag (MDT).

- If the information at the current cursor position is part of a light-pen detectable Attention field, using CURSR_SEL immediately sends only the addresses of all modified fields to the host.

ENTER

Use ENTER to send the unprotected information on the screen to the host application program.

PROGRAM ACCESS (PA) KEYS

Use Program Access keys (PA1 - PA3) to send specific messages to the application program. In the AT&T 3270 Emulator+, these keys are active only during a session with the application program.

PROGRAM FUNCTION (PF) KEYS

When you use a Program Function key (PF1 - PF24), the information on the screen is sent to the host application program. The function performed by each key is specific to the application. In SNA mode, these keys are active only during a session with the application program. In BSC mode, they are active only when the terminal is unlocked.

SYS_REQ (SNA only)

When using the AT&T 3270 Emulator+, use SYS_REQ to switch your terminal between a session with the SSCP and the application program (PLU). This sequence activates keyboard reset and clear operations. When your terminal is not in an active session with the application, you can use SYS_REQ to toggle the terminal between a session with the network control program (SSCP) and the unowned state.

TEST_REQ (BSC only)

If you are having difficulty with your terminal, use TEST_REQ to send a test message to the host indicating a possible terminal failure condition.

Printer-Specific Keys

These key capabilities are used to make local printer assignments.

DEV_CNCL

The DEV_CNCL key may be defined; however, its function is not supported.

IDENT

Use IDENT to change local printer assignments. IDENT allows you to direct the output from a PRINT key operation to the pathname of a disk file or physical printer, or to filter the output through a UNIX system command. IDENT can also be used to disable the PRINT key. When you use IDENT, you are prompted for the print mode number. If you don't know the number, press RETURN to display this menu:

```
Screen Print Mode Menu
------ ----- ---- ----

    0   Disable Screen Print
        1   Write to File
        2   Pipe to Command
        9   No change

        Screen print mode is 1, File: /tmp/lu6

Please select print mode:
```

- If you select print mode 0, no printer assignment is made. Note that print mode 0 disables the PRINT key; any attempt to use PRINT will lock the keyboard and put ILLEGAL FUNCTION on the status line.

- If you select print mode 1, you are prompted for a pathname identifying a disk file. If the specified file cannot be opened or written to during execution of a print request, the appropriate operating system error code is displayed on the screen. (Press RETURN to continue.)

- If you select print mode 2, you are prompted for a command line. For example, **/usr/bin/lp** would specify the printer spooler, **lp**. The command **sort > /tmp/foo** is an example of re-directing to a file through a filter. If the specified command line is invalid, or an error occurs while executing it, the operating system error message is displayed on the screen. (Press RETURN to continue.)

- If you select print mode 9, the print mode will remain unchanged.

PRINT

When you use PRINT, the information on the screen is copied to the local printer that was assigned using IDENT or that was assigned explicitly or by default when the Terminal Emulator was invoked. This means that IDENT need not be used for PRINT to work.

If a print fails, the print mode will be set to 0. To reset the print mode, use the IDENT key as described above.

Termination Keys

Use these key capabilities to exit from or suspend the Terminal Emulator.

EXIT

EXIT is equivalent to the ON/OFF switch on the 3278/9 Display Station. This function ends the Terminal Emulator session and returns you to the Terminal Function Selection Menu. The emulated terminal session is then considered powered-off by the controller.

> NOTE
>
> EXIT does not send a power-off signal to the host. Do not use this function alone as an exit vehicle from your host application. You should log off or sign off to end a session *before* exiting the Terminal Emulator.

SHELL

Use SHELL to escape to the UNIX operating system. Note that while you are escaped to the shell updates to all of your sessions will continue.

When you use SHELL, you will see an exclamation point (!) at the bottom of your screen, signifying that you can execute a single UNIX system shell command. After the command has executed, you will see the message Hit Return to continue. At this point you may leave the UNIX system by pressing RETURN, or you may execute another single UNIX system command by entering ! followed by the UNIX system command. (Note, however, that the environment established by one SHELL-invoked UNIX system command will not survive for a second SHELL-invoked UNIX system command, since a separate shell is invoked each time.)

If you have invoked the UNIX operating system for a single command by using SHELL and you find that you need to execute a series of UNIX system commands rather than just a single one, enter **sh** at the exclamation point (!) prompt. To leave the UNIX system after using **sh** use Ctrl-d or **exit** RETURN.

Status Line Keys

The 3278/9 Operator Information Area (described in Chapter 3, Screen Display) is displayed on your terminal as a status line. The following key capabilities change the mode of the status line or assign the status line to a specific line number.

STAT

Use STAT to toggle the modes of the status line display. The AT&T 3270 Emulator+ software supports three modes of status line display:

- Always display the status line, even if it covers up information on the screen.

- Never display the status line.

- Only display the status line when an error has occurred or the status line shows INHIBIT or LOCKED.

The status line mode is initially set to "Always display."

STMV

When the emulated terminal does not have a permanent status line, use STMV to establish the line on which the cursor is currently positioned as the status line. This function is not needed and not allowed on any terminal, such as the AT&T 4425, which handles the twenty-fifth line differently from the rest of the screen.

Local Keys

The following data entry key functions are executed without interacting with the host.

ALLCAP

To toggle the alphabetic character display between normal and all uppercase, use ALLCAP.

When this key toggles to uppercase state, lowercase characters may still be entered from the keyboard or received from the host. (This key affects only the display, not the data.) These lowercase characters remain in the screen buffer as lowercase but are displayed as uppercase. If you want to show the change on the current display, use ALLCAP followed by REDRAW. Resist the temptation to use the Caps_Lock key on your keyboard for this function. Doing so will disable emulator commands that require lowercase letters in their key sequences. (For example, if you use ESCxx for the EXIT key, ESCXX will not work.)

ALT_CR

Use ALT_CR to toggle the cursor between an underlined and a rectangular block display (if supported by your terminal).

BAKTAB

When the cursor is located anywhere in an unprotected data field other than the first character position, use BAKTAB to move the cursor to the beginning of the field. When the cursor is anywhere else, this key moves the cursor back to the beginning of the previous unprotected data field.

If the screen is entirely protected or entirely unprotected, BAKTAB positions the cursor at the top left-hand corner of the screen.

BLINK

Use BLINK to toggle the cursor between a blinking and a nonblinking display (if supported by your terminal).

BS

BS performs the same function as LEFT_A. Both move the cursor one position to the left.

CAN

Use CAN to cancel a partially entered multi-key sequence. For example, in the sequence Esc, Ctrl-z, if you have entered only the Esc key, CAN will cancel the Esc.

CLICK

Use CLICK to toggle the keyclick on and off (if supported by your terminal). While the terminal is unlocked, the keyclick remains in the state to which it was last set. When the terminal is locked, the keyclick operates in the opposite state.

DEL

Use DEL to delete the character at the current cursor position when the cursor is in an unprotected field. DEL causes all characters in the field to the right of the cursor and up to the end of the current field to be shifted left one position. The rightmost character in the field is replaced by a null character.

DUP

When you use DUP in an unprotected data field, a special character displays, and the cursor moves to the first character of the next unprotected field. While the significance of this key is application-dependent, entry of the DUP code into the display buffer normally tells the application program that it should duplicate the operation for the rest of the current field. If you use DUP when the cursor is at a field attribute character or in a protected field, the keyboard locks, and the cursor does not move.

When DUP is used on the IBM 3278/9 Display Station, the special character is displayed as an asterisk with an overscore. On emulated terminals, the special character is chosen from the target terminal's graphics character set during customization.

E_EOF

When the cursor is in an unprotected data field, use E_EOF to clear all characters from the cursor position to the end of the field to null characters. E_EOF does not affect the position of the cursor.

If you use E_EOF while the cursor is positioned at an attribute character or within a protected field, the keyboard locks, nothing is cleared, and the cursor does not move. If the screen is unformatted, all characters from the current cursor location to the last character position on the bottom line are erased.

E_INPUT

When you are working with a formatted screen, use E_INPUT to clear all unprotected fields to null characters and position the cursor at the first unprotected character position on the screen.

If the entire screen is protected, no fields are cleared, and the cursor is "homed" to the upper left-hand corner of the screen.

In an unformatted screen, E_INPUT clears the entire screen to nulls and "homes" the cursor.

FM

When you use FM, you add a special character to the contents of the display buffer for your terminal. This character is significant to the host application program. Like DUP, the significance of FM is application-dependent. However, when the contents of the display buffer are unformatted, FM typically indicates end-of-field to the application program. When the buffer contents are formatted, FM normally denotes end-of-sub-field.

If you use FM when the cursor is positioned at a field attribute character or in a protected field, the keyboard locks and the cursor does not move.

When FM is used on the IBM 3278/9 Display Station, the special character is displayed as a semicolon with an overscore. On emulated terminals, the special character is chosen from the target terminal's graphics character set during customization.

HOME

Use HOME to position the cursor at the first unprotected character position of the screen.

If the screen is entirely protected or entirely unprotected, this key positions the cursor at the top left-hand corner of the screen.

INS

Use INS to place the keyboard into insert mode. When you use INS, the Operator Information Area of the screen signals this state by displaying "INSERT." (Note that with terminals displaying row and column information on the bottom right of the screen, such as the Teletype 5425, the INSERT message may not be visible.) When the keyboard is in insert mode and you enter an alphanumeric character at the cursor position, all characters to the right of the cursor and up to the next null character will shift one space to the right.

INS locks the keyboard when:

- an insertion causes the field to overflow

- an insertion is attempted at a field attribute character

- an insertion is attempted in a protected field.

When the terminal is in insert mode, RESET or any key sequence that starts host communication returns the keyboard to normal mode.

NEWL

Use NEWL to move the cursor to the first unprotected character location of the next line.

If the entire screen is protected, this key positions the cursor at the top left-hand corner of the screen. If the screen is unformatted, this key positions the cursor at the beginning of the next line.

NULLEND

Use NULLEND to erase all trailing blanks in the field where the cursor is positioned and enter insert mode. The cursor may be in any position within the field. If the cursor is at an attribute character or within a protected field when you use NULLEND, the terminal is locked and nothing is erased.

NUM_OV

Use NUM_OV to enter a non-numeric character into a numeric field. This key is effective only for the next character entered.

REDRAW

When the UNIX operating system, a background task, or a user at another terminal writes to your terminal screen, the screen may become cluttered with these data. Use REDRAW to refresh the screen. This key restores the most recently displayed 3278/9 Terminal Emulator data.

RESET

Use RESET to unlock your keyboard following an illegal keyboard operation. RESET clears any error messages from the status line. This key is inactive while the terminal is communicating with the host system, and during execution of a print request, PRINT.

TAB

Use TAB to move the cursor to the first character of the next unprotected data field. If the screen is entirely protected or entirely unprotected, the cursor moves to the top left-hand corner of the screen.

UP_A, DOWN_A, RIGHT_A, LEFT_A, RDUB, LDUB

Use these key functions to move the cursor up, down, right, left, two locations right, and two locations left, respectively. The cursor will move to the appropriate character position regardless of field attributes that might block data entry into the field.

COLOR

This key toggles between color and monochrome if the terminal supports color. Otherwise, this key is ignored.

TOP/BOTTOM

For terminals using 132 column mode (Model 5), these keys are used to display the top or bottom part of the screen when the number of lines of the display is greater than the number of lines on the physical terminal used for emulation. (The full size of the display is 132 columns x 27 rows.) These keys result in scrolling when size mismatch exists (i.e., the number of lines on the physical terminal is less than the number of lines on the logical display). Otherwise, these keys are ignored.

Multi-Session Keys

CTRL

This key function transfers control to the 3278/9 Terminal Emulator, which displays the Terminal Function Selection Menu. (This is not the same as the control key on your terminal.)

NEXTS

This key function transfers keyboard and screen control to the session sequentially following the current session. If you have no other active sessions, you will be returned to the Terminal Function Selection Menu. The functionality of this key is equivalent to the n option on the Terminal Function Selection Menu.

PREVS

This key function transfers keyboard and screen control to the session sequentially preceding the current session. The functionality of this key is equivalent to the p option on the Terminal Function Selection Menu.

3   Screen Display

Introduction

Part of the function of the 3278/9 Terminal Emulator is to make the screen display on your ASCII terminal look as much as possible like the screen display on an IBM 3278 or 3279 Display Station. Two areas of this display are described in this section: the application program area and the operator information area.

Application Program Area

The application program area is where your program input and output are displayed. The appearance of this area will vary with the application program.

Operator Information Area (Status Line)

The Operator Information Area displays in symbols, words, and numerals the status of the terminal, the attached devices, and communication with the host system. On the IBM 3278/9 Display Station, it is located on the twenty-fifth line of the screen.

Because not all terminals used with the 3B Computer have an addressable twenty-fifth line, and because not all have the same graphics capabilities as an IBM 3278 or 3279 Display Station, the Terminal Emulator cannot mimic the appearance of the Operator Information Area. Instead, the Operator Information Area is implemented by the Terminal Emulator as a status line on your screen. (Your System Administrator can customize the location at which the status line appears on your display. Refer to the *AT&T 3270 Emulator+ System Administrator's Guide* for more information on how the Operator Information Area is implemented.)

The status line displays a set of natural language messages that correspond to the Operator Information Area symbols, words, and numerals. Figure 3-1 lists the possible status line messages, their fields, and their IBM equivalents, and it gives a description of each status line message.

> **NOTE** Status line fields range from 0 (left) to 7 (right) and are of varying lengths.

Message	Status Line Field	Corresponding IBM Symbol	Description
invalid	0	none	Power-on sequence in progress.
PLU	0	solid block (cursor shape)	Terminal is connected to application program (SNA).

Message	Status Line Field	Corresponding IBM Symbol	Description
SSCP	0	stick figure	Terminal is connected to the system services control point (SNA).
BSC	0	solid block (cursor shape)	Using BSC Controller
INACTIVE	0	none	The controller is waiting for host connection.
UNOWNED	0	'?' enclosed in block	Terminal is connected to the controller process but not to the application program (PLU), or network control program (SSCP).
WAIT	1	'X' and clock	Communication with host is in progress.
INHIBIT	2	'X'	Keyboard is locked.
WHAT?	3	'X ? +'	Terminal will not accept this operation. Press RESET and try the operation again.
SYSTEM	3	'X SYSTEM'	Keyboard is disabled by the host. Wait for host to re-enable or press RESET to restore keyboard.

Message	Status Line Field	Corresponding IBM Symbol	Description
NOT HERE	3	'X <-', stick figure, '>'	Operator action was performed in wrong location. Press RESET.
TOO MUCH	3	'X', stick figure, '>',	Operator entry exceeded field length. Press RESET.
NUMERIC	3	'X', stick figure, 'NUM'	Non-numeric data was entered in a numeric field. Press RESET.
WHAT	3	'X-f'	Requested operation is not available. Press RESET.
BAD KEY TRANSLATION	3	'X-S'	The terminal emulation process does not recognize this entry. Press RESET to continue.
PRINT IN PROGRESS	3	-	Printing is in progress
PRINT FAILED	3	-	Printing failed. Press RESET.
NO BLANKS TO CLEAR	3	-	NULLEND key with no trailing blanks Press RESET.

Message	Status Line Field	Corresponding IBM Symbol	Description
>4nn<	4	'X PROG4nn'	An error exists in data from host (nn defines the type of Program Check: see Appendix B). Press RESET.
>5nn<	5	'X_5nn'	A problem exists with the communication line to the host (nn defines the type of Communication Check: see Appendix B). Press RESET.
INSERT	6	"^"	Terminal is in insert mode. Press RESET to discontinue insert mode.
*	7	-	Indicates an event has occurred in one of your other sessions started from the same terminal.

Figure 3-1: Status Line Messages

4 Using the 3278/9 Terminal Emulator

Configuring Your Environment

Before you can use the 3278/9 Terminal Emulator, your environment must be properly configured. In particular, the following environment variables should be set and exported; **P3274**, **D3274**, **SC3279**, **KY3279**, **TM3279**, and **PF3274**. In addition, your **PATH** variable must include the 3270 Emulator+ **runtime** directory.

Ask your System Administrator to set up your environment appropriately. Your System Administrator should also provide you with a table showing how each environment variable should be set.

Session States

When the AT&T 3270 Emulator+ software is in use, a 3278/9 emulated session is in one of two conditions:

Powered-off   The session within the Terminal Emulator is not running, and therefore is not in communication with the controller process. (The 3278/9 Terminal Emulator can be running with no sessions powered on.)

Powered-on   A session within the Terminal Emulator is running and is connected to the controller process.

A powered-on session may be in any of the following states:

Inactive	The controller process is not communicating with the host. (Indicated by INACTIVE on the screen.)
Invalid	This is a temporary 3270 Emulator+ state that is present only when first starting the 3278/9 Terminal Emulator. (Indicated by invalid on the screen.)
Unowned	The terminal process is communicating with the controller, but it is not communicating with a host. The SYS_REQ emulator key can be used to change to an SSCP state from an unowned state. (Indicated by UNOWNED on the screen.)
SSCP-LU session (SNA only)	The terminal logical unit (LU) is connected to and can communicate with the control program SSCP. Once this connection has been made, an LU-LU session can be established. (Indicated by SSCP on the screen.)
LU-LU session (SNA only)	The terminal secondary logical unit (SLU) is connected to the application program primary logical unit (PLU) and can communicate with the application. The SYS_REQ emulator key can be used to return to an SSCP state from an LU-LU session. (Indicated by PLU on the screen.)
Locked	The keyboard is disabled when an error condition exists or when it is explicitly locked by the host. (Indicated by INHIBIT or KEYBOARD LOCKED on the screen.)
Unlocked	The keyboard is enabled, allowing you to use the emulated terminal.

Invoking the Terminal Emulator

To invoke the 3278/9 Terminal Emulator from your terminal, use the following command format:

te3279 [−e]

This is an abbreviated command format. The −e option provides extended attribute processing, namely, extended color and extended highlighting. If your environment has been set up properly, you should not have to specify any other options. Consult your System Administrator to obtain the exact options you need to invoke **te3279**.

| NOTE | Appendix D contains a complete list of options to the **te3279** command. |

Starting a 3278/9 Session

To access a host using the AT&T 3270 Emulator+:

Step 1.   Turn on your terminal.

Step 2.   Log in to the UNIX system.

Step 3.   Ask your System Administrator to start the Controller and
Printer Emulators. Before starting the emulators, the System
Administrator sets your environment variables. (The System
Administrator may edit your **.profile** so that they are automati-
cally set up when you log in.)

Step 4.   Check to see that your terminal environment has been properly
set by typing **env** and pressing RETURN. (Please contact your
System Administrator if the list of environment variables that
appears on the screen is not the same as the list supplied by your
System Administrator.)

Step 5.   Type **te3279** and press RETURN. If the System Administrator has
initialized your environment properly, options are not required
unless you will be using the extended attribute functions (−e
option). If options are required, the exact **te3279** command can
be supplied by your System Administrator.

Step 6.   Once you have executed **te3279**, the AT&T 3278/9 Terminal Emu-
lator banner will be displayed. Press RETURN; your first session
will be established immediately.

Step 7.   Log in to your host application program. (If you are not familiar
with your host application, ask your System Administrator for
the correct procedure.)

Step 8.   Use the key sequences listed for your terminal type to emulate
each of the 3278/9 key functions. (Appendix C contains a com-
plete list of the 3278/9 key sequences for each supported termi-
nal type.)

Step 9.   You may display the Terminal Function Selection Menu at any
time while within a session by using the CTRL key sequence
(normally ESC f d). Using the Menu you may start another new

session (up to four host sessions may be established) or execute any of the other Menu functions.

Chapter 5, Using the Terminal Function Selection Menu, describes each of the menu functions in detail.

5   Using the Terminal Function Selection Menu

Introduction

This section describes how to use each of the functions listed in the Terminal Function Selection Menu. Once you have started the Terminal Emulator, use your CTRL key sequence (normally ESC f d) to display the Terminal Function Selection Menu.

```
Terminal Function Selection Menu

     c     Display all current sessions
     a     Power on a new session
     d     Power off a specific session
     s     Select a specific session
     n     Select the next session
     p     Select the previous session
     e     Execute shell command
     i     Printer assignment (IDENT key)
     x     Exit the process (power off all sessions)
     .     Return to current session

     Please select function:
```

The ten functions listed in the menu allow you to:

- add, select and delete sessions

- toggle from one session to another

- escape to the shell and assign printers

- list all powered-on sessions

- exit the process

To select a function simply enter the letter for the function followed by RETURN, and then follow the system prompts for that task.

Power On a New Session

```
Terminal Function Selection Menu

        c    Display all current sessions
        a    Power on a new session
        d    Power off a specific session
        s    Select a specific session
        n    Select the next session
        p    Select the previous session
        e    Execute shell command
        i    Printer assignment (IDENT key)
        x    Exit the process (power off all sessions)
        .    Return to current session

        Please select function: a
```

To establish a new session with a host, enter **a**. You will be prompted to enter the following information:

```
For new session, please enter
    Controller pipe name (Default: mmmn)

    LU Port (Default: Any)
```

If your environment is properly set, you can simply hit RETURN after each of these prompts.

The `Controller pipe name` specifies the path to the controller. Each controller has its own pipe name. If you need to specify this option, your System Administrator will provide you with the exact pipe name(s) you should use. (The default is the value of your **P3274** variable.)

The `LU port` specifies the port number to be used as it is configured in the controller and known to the host. If you need to specify this option, your System Administrator will provide you with the number. (The default is the value of your **D3274** variable.)

Display All Current Sessions

```
Terminal Function Selection Menu

        c    Display all current sessions
        a    Power on a new session
        d    Power off a specific session
        s    Select a specific session
        n    Select the next session
        p    Select the previous session
        e    Execute shell command
        i    Printer assignment (IDENT key)
        x    Exit the process (power off all sessions)
        .    Return to current session

        Please select function: c
```

To display all the sessions that you currently have established with the host,
enter c. The following screen will be displayed.

```
Session      Controller     LU                Event       Cur
No.          Name           Port    Owner     Occurred    Ses
--------     ----------     ----    -----     --------    ---

1            /tmp/P3274.2   0       BSC                     *

2            /tmp/P3274.4   3       PLU       x

[Hit return to continue.]
```

Session No.   Lists your active session numbers (1-4).

Controller Name   This is the pipe to the controller you are using.

LU Port   This is the LU port number you are connected to.

Owner   Specifies the terminal state.

Event Occurred   An "x" in this field indicates that an event
has occurred in the session since you were last there.

Cur Ses   The asterisk denotes the session you are currently in, if any.

Select a Session

```
Terminal Function Selection Menu

        c       Display all current sessions
        a       Power on a new session
        d       Power off a specific session
        s       Select a specific session
        n       Select the next session
        p       Select the previous session
        e       Execute shell command
        i       Printer assignment (IDENT key)
        x       Exit the process (power off all sessions)
        .       Return to current session

        Please select function: s
```

To toggle to another active session, enter s. The system will prompt you to
enter the session number.

> Please select session 1-4, or 0 for menu:

The Select the next session and Select the previous session functions
allow you to toggle forward or back one session. Enter . (a period) to return
to your current session.

Power Off a Specific Session

```
Terminal Function Selection Menu

     c    Display all current sessions
     a    Power on a new session
     d    Power off a specific session
     s    Select a specific session
     n    Select the next session
     p    Select the previous session
     e    Execute shell command
     i    Printer assignment (IDENT key)
     x    Exit the process (power off all sessions)
     .    Return to current session

     Please select function: d
```

To power off a specific session, enter **d**. The system will prompt you as follows:

> Please select session 1–4, or 0 for menu:

When the session has been ended, the following message is flashed:

> TERMINAL SESSION TERMINATED

and the Terminal Function Selection Menu is displayed.

| NOTE | You should always log off from your host application before powering off a session. |

Power Off All Sessions

When you are finished using the emulator and are ready to return to the UNIX operating system, execute the following steps:

Step 1.   Exit your host application(s).

You should always log off from you host application(s) before you exit the emulator. If you are not familiar with the application program, ask your System Administrator for the correct procedure.

Step 2.   When the Terminal Function Selection Menu is displayed, enter x to exit the emulator. This ends all terminal sessions and returns you to the UNIX operating system.

```
Terminal Function Selection Menu

        c    Display all current sessions
        a    Power on a new session
        d    Power off a specific session
        s    Select a specific session
        n    Select the next session
        p    Select the previous session
        e    Execute shell command
        i    Printer assignment (IDENT key)
        x    Exit the process (power off all sessions)
        .    Return to current session

        Please select function: x
```

For each session that was powered on, the system will respond with the following message:

TERMINAL SESSION TERMINATED

After all sessions have been powered off, the system will respond with TE3279 Process Exiting. Then your UNIX system prompt will be displayed. When the UNIX system prompt appears, proceed to your next task.

> NOTE Do not exit the emulator by turning off your terminal. The controller will not be notified that your terminal has been powered off and may attempt to send important data to your terminal. Data that are sent to a powered-off terminal will be lost.

Sample Host Application Session

The sample session that follows shows how to use the emulator for a simple data entry session. While your particular application will differ from this example, procedures for starting and ending the session and for using many of the emulator keys are the same for all application programs.

The sample session shows what you need to do to:

- Start the 3278/9 Terminal Emulator.

- Log in to your host application.

- Enter sample data.

- Print a screen of data using the local print facility.

- Exit the host application program.

- Exit from the 3278/9 Terminal Emulator.

Each step will be explained in detail.

Step 1.   Turn on your terminal. Notice that your UNIX system message appears and prompts you to log in.

Step 2.   Log in to the UNIX operating system by typing your account name and password at the system prompts.

Step 3.   If you have typed in the correct information for your account, the system messages of the day and standard UNIX system prompt ($) will appear.

Step 4.   Type **te3279** and press RETURN to start the terminal emulator.

In this example, the System Administrator for the host has set up the application program to begin whenever a particular user starts the terminal emulator. On your system a similar screen may appear to prompt for the specific application program you want to access.

```
WELCOME TO ABC ASSOCIATES BILLING SYSTEM

Do you want to:

        (1) generate a bill

        (2) generate a paycheck

        (3) generate a report

Select 1, 2, or 3:
```

Step 5.   Select menu option 2 to generate a paycheck.

Press 2 and RETURN.

A new screen is displayed. The data that you enter on this
screen (e.g., Social Security Number and hours worked) will be
used to generate the check.

```
Type of Transaction:     PAYCHECK

Employee Name:

  First Initial: __            Middle Initial: __

     Last Name: _____


Social Security Number: ___-__-____

Hours Worked: ___.__ regular    ___.__ overtime
```

Step 6.   Complete the screen by entering data in each field and pressing Ctrl-i (TAB) to move the cursor to the next field. If you make a mistake, delete characters using the DEL key.

Step 7.   Suppose you need an item of data to complete the screen (for instance, a Social Security Number) and the data are contained in a file under the UNIX operating system. Using ESC-s (SHELL), you can easily look at the file. The SHELL key temporarily suspends the terminal emulation process and allows you to access the UNIX operating system. You may enter one UNIX system command and then return automatically to the emulator.

Type ESC-s. The screen clears and the ! prompt is displayed.

NOTE

If you need to use more than one UNIX system command, you may create a shell by typing **sh** and pressing RETURN at the ! prompt. Creating a shell allows you to enter more than one command. Use Ctrl-d or **exit** RETURN to exit the shell and return to the emulator.

Step 8.   When the ! prompt is displayed, look up the information you
           need in the UNIX system file, using regular UNIX system com-
           mands such as cat.

```
$ cat employee.list

NAME              Soc. Security #      Paycode
Jones, P.           123-45-6789          850
Kane, A.            037-42-5678          100
Lester, C. A.       078-23-8765          400
Smith, J. A.        033-36-7102          250
Thomas, D.          231-00-6789          900
```

Step 9.   Press RETURN to return to the emulator when the UNIX system
           command execution ends. The screen on which you were work-
           ing will reappear.

```
Type of Transaction:       PAYCHECK

Employee Name:

    First Initial: J.           Middle Initial: A.

    Last Name: Smith

Social Security Number: 033-36-7102

Hours Worked:   40.00 regular      25.50 overtime
```

Step 10. Print the information on your screen by typing ESC-p (PRINT). The local PRINT key will copy the screen to the output area assigned by the IDENT key. (Your System Administrator will define a default assignment for you.)

Step 11. Process the information by pressing RETURN. While the host is processing the program, the status message WAIT is displayed.

Step 12. Exit your host application. Ask your System Administrator how to exit the host application if you are not familiar with the specific procedure for this application program. For TSO, enter **logoff**. For CICS, enter **CSSF**.

Step 13. At the Terminal Function Selection Menu, enter x to power off your session and exit from the 3278/9 Terminal Emulator. *Do not exit the emulator by turning off your terminal.* The controller will not be notified that your terminal has been powered off and may attempt to send important data to your terminal. Data that are sent to a powered-off terminal will be lost.

Step 14. When the UNIX system prompt is displayed, you may proceed to your next task or log off.

A   Documentation

Documentation

AT&T 3270 Emulator+

- *AT&T 3270 Emulator+ User's and System Administrator's Guides* (select code 308-400)
- *AT&T 3270 Emulator+ HLLAPI Programmer's Guide* (select code 308-332)
- *AT&T 3270 Emulator+ Product Overview* (select code 308-001)
- *AT&T 3270 Emulator+ 3B2 Release Notes* (select code 308-002)
- *AT&T 3270 Emulator+ 3B5/3B15/3B4000 Release Notes* (select code 308-335)

3B Computers

- *AT&T 3B2/300 Computer Owner/Operator Manual* (select code 305-301)
- *AT&T 3B5/300 User Guide and Essential Utilities* (select code 305-302)

UNIX System V

Documents describing UNIX System V are available from the Customer Information Center (see "Ordering AT&T Documentation" below).

IBM 3270 and SNA Documentation

The following IBM publications are relevant:

- *An Introduction to the IBM 3270 Information Display System* (GA27-2739).
- *IBM 3274 Control Unit Planning, Setup, and Customizing Guide* (GA27-2827).

- *IBM 3270 Information Display System, 3274 Control Unit Description and Programmer's Guide* (GA23-0061)

- *Systems Network Architecture Concepts and Products* (GC30-3072).

- *Systems Network Architecture Technical Overview* (GC30-3073).

- *Systems Network Architecture Reference Summary* (GA27-3136).

- *IBM Systems Network Architecture Format and Protocol Reference Manual* (SC30-3112).

Ordering AT&T Documentation

AT&T documentation may be ordered by calling the AT&T Customer Information Center (CIC) at:

1-800-432-6600 (toll free within the continental United States)

or by writing to:

AT&T Customer Information Center
Customer Service Representative
P.O. Box 19901
Indianapolis, Indiana 46219

B Error Codes

Error Codes

For detailed information about all the error codes listed in this appendix, see the *IBM 3270 Information Display System, 3274 Control Unit Description and Programmer's Guide* listed in "Documentation" above.

Program Check — SNA/3270

401   unknown data stream command
402   invalid buffer address in data stream
403   data follows 1-byte commands in data stream
404   data stream ends in order-pending state
411   Request/Response Unit (RU) too long (LU.T1)
413   function not supported
420   exception response request received when definite response
        only was specificed by BIND
421   definite-response request received when exception response
        only was specified by BIND
422   NO response not allowed
423   format indicator not allowed
430   sequence number error
431   chaining error
432   bracket error
433   data traffic inactive
434   direction error
443   read command must have Change Direction, not End
        Bracket
445   Activate Logical Unit (ACTLU) request does not apply to
        cold activation or Error Recovery Procedure (ERP)
450   BIND profile error
451   BIND primary protocol error
452   BIND secondary protocol error
453   BIND common protocol error
454   BIND screen size error
455   BIND LU profile error
456   BIND LU1 error
457   BIND cryptography specified
462   data stream error detected by LU.T1
470   unknown data byte X'00' - X'3F' or X'FF'
498   negative response received
499   exception request received

Communication Check — SDLC Errors

501   Data Set Ready (DSR) lost
502   Clear To Send (CTS) lost
504   Normal Disconnect Mode (NDM)
505   NDM
510   Physical Unit (PU) is not active
518   segmentation error (internal Deactivate Physical Unit
        (DACTPU))
519   received frame too long
520   timeout (no frames)
521   timeout (no flags)
525   20 Exchange Identification (XID) commands received in a
        row
528   Frame Reject Response (FRMR) sent; Frame Reject Mode
        (FRM) entered (internal DACTPU)
529   modem acting up (internal DACTPU)
530   clocking or CTS list (internal DACTPU)

Program Check — BSC/3270

401   unknown data stream command
402   invalid buffer address in data stream
403   data follows 1-byte commands in data stream
404   data stream ends in order-pending state
405   invalid copy command was received
406   invalid command sequence received
408   line buffer overflow
480   user request lost due to host SELECT
481   user request lost due to host SELECT with bad command
482   host SELECT received with response to user request
483   host SELECT with bad command received with response
        to user request

Communication Check — BSC Errors

530   clocking or CTS lost (internal DACTPU)
531   CU has sent a NAK
532   approximately 20 seconds have elapsed without detecting
       SYN characters on the line
533   the CU did not receive ETX or ETB with the last block of
       text transmitted by the host
534   the CU did not receive a response to its last block sent,
       and has sent ENQ 15 times
535   the CU received 15 consecutive NAKs
536   the CU received 15 consecutive ACK0s instead of ACK1s
       or vice versa

C Key Sequences

Key Sequences for Standard ASCII Terminals

The AT&T 4415 and 5420, and the Tektronix 4105 terminals use these key sequences. Certain key functions, such as COLR, are ignored if the terminal does not support them. Note that any terminal can use KY.std.

3278/9 Key Function	Standard ASCII Terminal Key Sequence
ALLCAP	\<ESC\> m
ALT_CR	\<ESC\> n
ATTN	\<ESC\> a \<RETURN\>
BAKTAB	\<CTRL\> e
BLINK	\<ESC\> b l
BOT	\<ESC\> bot
BS	\<CTRL\> h
CAN	\<CTRL\> x
CENT	^
CLEAR	\<ESC\> z
CLICK	\<ESC\> k
COLR	\<ESC\> clr
CTRL	\<ESC\> fd
CURSR_SEL	\<ESC\> c \<RETURN\>
DEL	\<DEL\>
DEV_CNCL	\<ESC\> d
DOWN_A	\<CTRL\> v
DUP	\<CTRL\> d
E_EOF	\<ESC\> e f
E_INPUT	\<ESC\> e i
ENTER	\<RETURN\>
ENTER1	\<RETURN\>
EXIT	\<ESC\> x x
FM	\<CTRL\> k
HOME	\<CTRL\> o
IDENT	\<ESC\> i
INS	\<CTRL\> u
LDUB	\<CTRL\> r
LEFT_A	\<CTRL\> f

3278/9 Key Function	Standard ASCII Terminal Key Sequence
NEWL	\<CTRL> j
NEXTS	\<ESC> +
NOT	]
NULLEND	\<CTRL> b
NUM_OV	\<CTRL> n
PA1 TO PA3	\<ESC> a *key number* \<RETURN>
PF1 to PF24	\<ESC> *key number* \<RETURN>
PREVS	\<ESC> +
PRINT	\<ESC> p
RDUB	\<CTRL> y
REDRAW	\<ESC> r
RESET	\<CTRL> a
RIGHT_A	\<CTRL> g
SHELL	\<ESC> s
SOLID	[
STAT	\<ESC> l
SYS_REQ (SNA only)	\<ESC> q
TAB	\<CTRL> i
TEST_REQ (BSC only)	\<ESC> q
TOP .	\<ESC> top
UP_A	\<CTRL> t

Figure C-1: AT&T 3278/9 Key Sequences For Standard ASCII Terminals (using KY.std).

Key Sequences for AT&T 4410 and Teletype 5410 Terminals

3278/9 Key Function	AT&T 4410 and Teletype 5410 Key Sequence
ALLCAP	\<ESC\> m
ALT_CR	\<ESC\> n
ATTN	\<ESC\> a \<RETURN\>
BAKTAB	\<DOWN DIAGONAL ARROW\>
BS	\<CTRL\> ^h
CAN	\<CTRL\> x
CENT	^
CLEAR	\<ESC\> z
CLICK	\<ESC\> k
CTRL	\<ESC\> f d
CURSR_SEL	\<ESC\> c \<RETURN\>
DEL	\<DEL\>
DEV_CNCL	\<ESC\> d
DOWN_A	\<DOWN ARROW\>
DUP	\<CTRL\> d
E_EOF	\<ESC\> e f
E_INPUT	\<ESC\> e i
ENTER	\<RETURN\>
ENTER1	\<RETURN\>
EXIT	\<ESC\> x x
FM	\<CTRL\> k
HOME	\<UP DIAGONAL ARROW\>
IDENT	\<ESC\> i
INS	\<CTRL\> u
LDUB	\<CTRL\> r
LEFT_A	\<LEFT ARROW\>
NEWL	\<CTRL\> j
NEXTS	\<ESC\> >
NOT	]
NULLEND	\<CTRL\> b
NUM_OV	\<CTRL\> n

3278/9 Key Function	AT&T 4410 and Teletype 5410 Key Sequence
PA1 to PA3	\<ESC> a *key number* \<RETURN>
PF1 to PF9	\<ESC> *key number*
PF10	\<ESC> 0
PF11	\<ESC> -
PF12	\<ESC> =
PF13	\<ESC> \<SHIFT> 1
PF14	\<ESC> \<SHIFT> 2
PF15	\<ESC> \<SHIFT> 3
PF16	\<ESC> \<SHIFT> 4
PF17	\<ESC> \<SHIFT> 5
PF18	\<ESC> \<SHIFT> 6
PF19	\<ESC> \<SHIFT> 7
PF20	\<ESC> \<SHIFT> 8
PF21	\<ESC> \<SHIFT> 9
PF22	\<ESC> \<SHIFT> 0
PF23	\<ESC> \<SHIFT> -
PF24	\<ESC> \<SHIFT> =
PREVS	\<ESC> <
PRINT	\<ESC> p
RDUB	\<CTRL> y
REDRAW	\<ESC> r
RESET	\<CTRL> a
RIGHT_A	\<RIGHT ARROW>
SHELL	\<ESC> s
SOLID	[
STAT	\<ESC> l
SYS_REQ (SNA only)	\<ESC> q
TAB	\<CTRL> i
TEST_REQ (BSC only)	
UP_A	\<UP ARROW>

Figure C-2: AT&T 3278/9 Key Sequences for AT&T 4410 and Teletype 5410 Terminals

Key Sequences for AT&T 4418 and Teletype 5418 Terminals

3278/9 Key Function	AT&T 4418 and Teletype 5418 Key Sequence
ALLCAP	<ALT CSR>
ATTN	<ATTN>
BAKTAB	<BACK TAB>
BANG	!
BS	<BACK SPACE>
CAN	<CTRL> x
CENT	^
CLEAR	<CLEAR>
CTRL	<ESC> f d
CURSR_SEL	<CSR SEL>
DEL	<DEL>
DEV_CNCL	<DEV CNCL>
DOWN_A	<DOWN ARROW>
DUP	<DUP>
E_EOF	<ERASE EOF>
E_INPUT	<ERASE INPUT>
ENTER	<ENTER> (lower right side)
ENTER1	<ENTER> (upper left side)
EXIT	<ESC> x x
FM	<FIELD MARK>
HOME	<HOME>
IDENT	<IDENT>
INS	<INS>
LDUB	<LEFT DOUBLE ARROW>
LEFT_A	<LEFT ARROW>
NEWL	<NEW LINE>
NEXTS	<ESC> +
NOT	]
NULLEND	<CTRL> b
NUM_OV	<CTRL> n
PA1	<PA1>

3278/9 Key Function	AT&T 4418 and Teletype 5418 Key Sequence
PA2	<PA2>
PA3	<SHIFT> <INS>
PF1 to PF24	<PF1> TO <PF24>
PREVS	<ESC> –
PRINT	<PRINT LCL>
RDUB	<RIGHT DOUBLE ARROW>
REDRAW	<ESC> r
RESET	<RESET> (lower left side)
RIGHT_A	<RIGHT ARROW>
SHELL	<SHIFT> <RESET> (upper left side)
SOLID	[
STAT	<RESET> (upper left side)
SYS_REQ (SNA only)	<SYS REQ>
TAB	<CURSOR TAB>
TEST_REQ (BSC only)	
UP_A	<UP ARROW>

Figure C-3: AT&T 3278/9 Key Sequences for AT&T 4418 and Teletype 5418 Terminals

---

NOTE	On these terminals no key is marked ESC or CTRL. For ESC, hold ALT and press [. For CTRL use the key immediately to the left of the space bar.

Key Sequences for AT&T 4425 and Teletype 5425 Terminals

3278/9 Key Function	AT&T 4425 and Teletype 5425 Key Sequence
ALLCAP	\<ESC\> m
ATTN	\<ESC\> a \<RETURN\>
BAKTAB	\<SHIFT\> \<TAB\>
BOT	\<ESC\> \<btm\>
BS	\<BACK SPACE\>
CAN	\<CTRL\> x
CENT	^
CLEAR	\<CLEAR\>
CTRL	\<ESC\> f d
CURSR_SEL	\<ESC\> c \<RETURN\>
DEL	\<DEL\>
DEV_CNCL	\<ESC\> d
DOWN_A	\<DOWN ARROW\>
DUP	\<CTRL\> d
E_EOF	\<CLEAR LINE\>
E_INPUT	\<DELETE LINE\>
ENTER	\<RETURN\>
ENTER1	\<ENTER\> (on keypad)
EXIT	\<ESC\> x x
FM	\<CTRL\> k
HOME	\<HOME\>
IDENT	\<ESC\> i
INS	\<INSERT CHAR\>
LDUB	\<CTRL\> r
LEFT_A	\<LEFT ARROW\>
NEWL	\<CTRL\> j
NEXTS	\<ESC\> +
NOT	]
NULLEND	\<INSERT LINE\>
NUM_OV	\<CTRL\> n
PA1 TO PA3	\<ESC\> a *key number* \<RETURN\>

3278/9 Key Function	AT&T 4425 and Teletype 5425 Key Sequence
PF1 TO PF4	<PF1> to <PF4>
PF5	7 (on keypad only)
PF6	8 (on keypad only)
PF7	9 (on keypad only)
PF8	- (on keypad only)
PF9	4 (on keypad only)
PF10	5 (on keypad only)
PF11	6 (on keypad only)
PF12	, (on keypad only)
PF13 TO PF24	<ESC> *key number* <RETURN>
PREVS	<ESC> −
PRINT	<ESC> p
RDUB	<CTRL> y
REDRAW	<ESC> r
RESET	<CTRL> a
RIGHT_A	<RIGHT ARROW>
SHELL	<ESC> s
SOLID	[
STAT	<ESC> l
SYS_REQ (SNA only)	<ESC> q
TAB	<TAB>
TEST_REQ (BSC only)	<ESC> q
TOP	<ESC> <top>
UP_A	<UP ARROW>

Figure C-4: AT&T 3278/9 Key Sequences for AT&T 4425 and Teletype 5425 Terminals

Key Sequences for AT&T 605 Business Communications Terminal with 102-Key Keyboard

3278/9 Key Function	AT&T 605 Terminal Key Sequence
ALLCAP	\<ESC\> m
ATTN	\<ESC\> a \<RETURN\>
BAKTAB	\<SHIFT\> \<TAB\>
BOT	\<ESC\> bot
BS	\<BACK SPACE\>
CAN	\<CTRL\> x
CENT	^
CLEAR	\<SHIFT\> \<CLEAR\>
CTRL	\<ESC\> f d
CURSR_SEL	\<ESC\> c \<RETURN\>
DEL	\<CTRL\> \<DEL\>
DEV_CNCL	\<ESC\> d
DOWN_A	\<DOWN ARROW\>
DUP	\<CTRL\> d
E_EOF	\<ESC\> e f
E_INPUT	\<SHIFT\> \<DELETE LINE\>
ENTER	\<RETURN\>
ENTER1	\<RETURN\>
EXIT	\<ESC\> x x
FM	\<CTRL\> k
HOME	\<CLEAR\> \<HOME\>
IDENT	\<ESC\> i
INS	\<INSERT LINE\>
LDUB	\<CTRL\> r
LEFT_A	\<LEFT ARROW\>
NEWL	\<CTRL\> j
NEXTS	\<ESC\> +
NOT	]
NULLEND	\<SHIFT\> \<INSERT\>

3278/9 Key Function	AT&T 605 Terminal Key Sequence
NUM_OV	\<CTRL\> n
PA1 TO PA3	\<ESC\> a *key number* \<RETURN\>
PF1 TO PF24	\<ESC\> *key number* \<RETURN\>
PREVS	\<ESC\> -
PRINT	\<ESC\> p
RDUB	\<CTRL\> y
REDRAW	\<ESC\> r
RESET	\<ESC\> c
RIGHT_A	\<RIGHT ARROW\>
SHELL	\<ESC\> s
SOLID	[
STAT	\<ESC\> l
SYS_REQ (SNA only)	\<ESC\> q
TAB	\<TAB\>
TEST_REQ (BSC only)	\<ESC\> q
TOP	\<ESC\> top
UP_A	\<UP ARROW\>

Figure C-5: AT&T 3278/9 Key Sequences for AT&T 605 Business Communications Terminal with 102-Key Keyboard

Key Sequences for AT&T 610, 615, 620, and 630 Terminals with 98-Key Keyboard

3278/9 Key Function	AT&T 610, 615, 620 and 630 Terminals Key Sequence
ALLCAP	\<ESC\> m
ATTN	\<ESC\> a \<RETURN\>
BAKTAB	\<SHIFT\> \<TAB\>
BOT	\<ESC\> b o t
BS	\<BACK SPACE\>
CAN	\<CTRL\> x
CENT	^
CLEAR	\<CLEAR\>
CTRL	\<ESC\> f d
CURSR_SEL	\<ESC\> c \<RETURN\>
DEL	\<DEL\>
DEV_CNCL	\<ESC\> d
DOWN_A	\<DOWN ARROW\>
DUP	\<CTRL\> d
E_EOF	\<ESC\> e f
E_INPUT	\<ESC\> e i
ENTER	\<RETURN\>
ENTER1	\<RETURN\>
EXIT	\<ESC\> x x
FM	\<CTRL\> k
HOME	\<HOME\>
IDENT	\<ESC\> i
INS	\<CTRL\> u
LDUB	\<CTRL\> r
LEFT_A	\<LEFT ARROW\>
NEWL	\<CTRL\> j
NEXTS	\<ESC\> +
NOT	]
NULLEND	\<CTRL\> b
NUM_OV	\<CTRL\> n
PA1 TO PA3	\<ESC\> a *key number* \<RETURN\>

3278/9 Key Function	AT&T 610, 615, 620 and 630 Terminals Key Sequence
PF1 TO PF24	<ESC> *key number* <RETURN>
PREVS	<ESC> -
PRINT	<ESC> p
RDUB	<CTRL> y
REDRAW	<ESC> r
RESET	<ESC> c
RIGHT_A	<RIGHT ARROW>
SHELL	<ESC> s
SOLID	[
STAT	<ESC> l
SYS_REQ (SNA only)	<ESC> q
TAB	<TAB>
TEST_REQ (BSC only)	<ESC> q
TOP	<ESC> t o p
UP_A	<UP ARROW>

Figure C-6: AT&T 3278/9 Key Sequences for AT&T 610, 615, 620 and 630
Terminals with 98-Key Keyboard

D The te3279 Command

The te3279 Command

The command to invoke the 3278/9 Terminal Emulator from your terminal is:

> te3279 [−t *termno*] [−s *screen_file*] [−k *key_file*] [−p *pipe*]
> [−f *printer_path*] [−M *msgfile*] [−m *model*] [−e]

Except for the −e option, if your environment has been set up properly, you should not have to specify any of these options. The −e option provides extended attribute support, namely, extended highlighting and extended color support.

The following list describes each of the options in detail:

−t *termno* where *termno* specifies acceptable terminal (LU) numbers. The controller selects a terminal number from those specified. The valid range of terminal numbers is 0-31. The user may specify a list of numbers (such as 1,5,7), a range of numbers (such as 10-15), or a combination (such as 1,5,7,10-15). The default environment variable is **D3274**, and the default value is the range 0-31.

−s *screen_file* where *screen_file* is the name of the screen control object file to be used for this terminal. If this option is omitted, the **SC3279** environment variable is used to obtain the name of the file.

−k *key_file* where *key_file* is the name of the keyboard mapping object file to be used for this terminal. If this option is omitted, the **KY3279** environment variable is used to obtain the name of the file.

−p *pipe* where *pipe* is the pipe name to the controller process that **te3279** will be using. This must be the pipe name created when the controller was started. If this option is omitted, the **P3274** environment variable is used to obtain the name of the pipe.

−f *printer_path*   where *printer_path* is the printer pathname for local print functions. If this option is omitted, the **PF3274** environment variable is used to obtain the printer pathname. This value may be overriden by the user on a per session basis once **te3279** has been invoked, by using the IDENT key.

−M *msg_file*   where *msg_file* is the message file name. If this option is omitted, the file name **te3279.msg** is used.

−m *model*   where *model* is the terminal model type, which may be:

2 - specifying a 24x80 screen buffer dimension

5 - specifying a 27x132 screen buffer dimension

−e   enables extended attribute support, namely, extended highlighting (blink, underscore, and reverse video) and extended color support. These capabilities must also be defined in the screen control object file used for your terminal.

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