Chapter 3

Terminal Operations

TERMINAL OPERATIONS

INTRODUCTION

This chapter discusses different types of terminal operations. It contains the following:

- Multiple Logical Terminals (MLT)

  This section describes multiple concurrent host sessions per terminal.

- Operator Information Area

  This section discusses the information area that appears on the terminal screen.

- Operator Entry Assist

  This section describes the screen editing and formatting capabilities available for any terminal.

- Additional Terminal Functions

  This section includes miscellaneous information about terminal operations such as Type Ahead.

MULTIPLE LOGICAL TERMINALS (MLT)

The Multiple Logical Terminals (MLT) feature enables a coax or A/A terminal to have one to five concurrent host sessions. The sessions can be held with one or two IBM hosts and numerous A/A hosts depending on the system configuration. A/A terminals must have 3270 emulation to establish sessions with an IBM host; coax terminals must have A/A emulation to establish sessions with A/A hosts.

The host sessions can be divided in any combination between the IBM and/or A/A hosts. For example, a coax terminal can run two sessions on IBM host 1, two sessions on IBM host 2, and one session on an A/A host. Or, the same terminal can have one session on IBM host 1, two sessions on IBM host 2, and two sessions on an A/A host.

NOTE: Though DFTs can have multiple host sessions, they do not participate in the MLT feature; they maintain their own internal session control.

MLT CONFIGURATION

LCP configuration must be performed prior to using MLT and the Host Selection menu. The configurable aspects of MLT and the corresponding LCP commands are:

CH	Name and configure the IBM host(s)
CO	Name and configure the A/A host(s)
CL	Authorize IBM host access to terminals
CD	Authorize A/A host access to terminals
CO	Configure terminal options
CO	Set maximum number of concurrent host sessions per terminal
CO	Set preferred host session
S	Connect and disconnect host sessions

For more information about the LCP commands as they relate to MLT, see "Dual IBM Host Support" in Chapter 1, and "Configure Logical Units," "Configure Terminal Options," and "Host Selection" in Chapter 2.

NOTE: The rest of the MLT chapter assumes that LCP configuration has been performed.

HOST SESSION ACCESS

When the terminal is first powered on, one of the following occurs:

- If the maximum number of concurrent sessions parameter in the Configure Terminal Options screen has the default value of (--), all LUs assigned to that terminal are activated. An LU assignment is equivalent to a single IBM host session. If three LUs are assigned the terminal, the terminal has three active host sessions. The default value allows only IBM host sessions; no A/A host sessions can be established.

- If the maximum number of concurrent sessions parameter has been configured for a value of 01-05, the Host Selection menu displays. The Host Selection menu cannot be accessed until this parameter is configured. At terminal power on, the first LU assigned to the terminal is activated, then you must enter the Host Selection menu and connect the remaining host sessions. You can establish both IBM and A/A host sessions depending on the system configuration.

- If the maximum number of concurrent sessions parameter has been configured for a value of 01-05 and a preferred host name has been indicated in the Configure Terminal Options screen, at terminal power on, a session is automatically established with the preferred host. Then, you must enter the Host Selection menu and establish the remaining sessions.

As each session is established, it is designated a session identifier, A (for the first session) through E (for the fifth session). After all desired sessions are connected, they may be accessed either with a Jump Key sequence, or through the Host Selection menu.

The session that displays on the screen is called the active foreground session. The other active sessions are call active background sessions (see Figure 3-1).

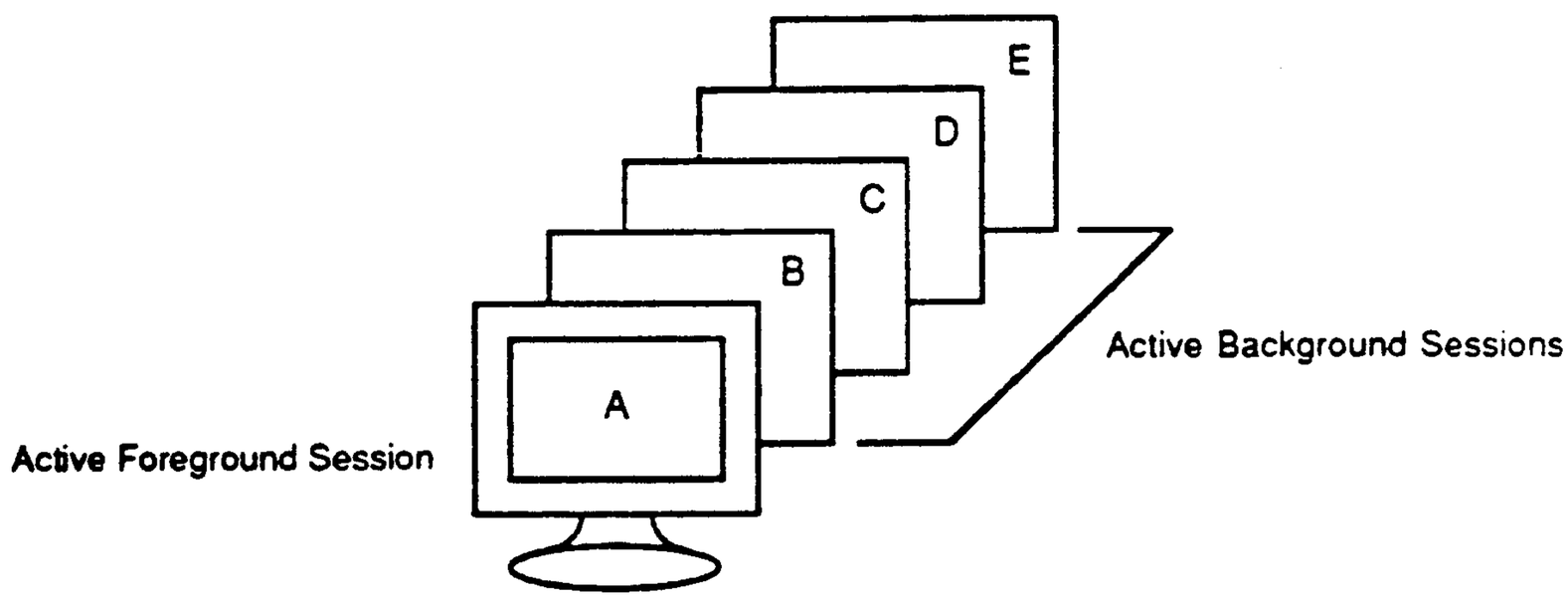


Figure 3-1. Active Foreground and Background Host Sessions

JUMP KEY

Special key sequences called Jump Keys allow you to switch easily between all active IBM and A/A host sessions regardless of session residency. When the Jump Key is pressed, the active foreground session becomes a background session and the designated background session becomes the current active foreground session.

Host sessions may be accessed either sequentially or specifically.

Sequential Access – The Host Selection menu shows the host session selection sequence using the session identifier letter. Simultaneously press the Alt and Insert keys to display the next consecutive session. Simultaneously press the Alt and Return keys to display the previous session.

Specific Access – Simultaneously press Alt and the session identifier to display a specific host session (see Figure 3-2).

Pressing the Extended and Select keys and the session identifier is an alternate way to switch sessions. This alternate is provided because on some coax keyboards, when Alt is pressed, alphabetic keystrokes are not processed. Also, while in an A/A host session, Alt on a coax keyboard is an equivalent to Control on an A/A keyboard. Many A/A applications require the use of Control.

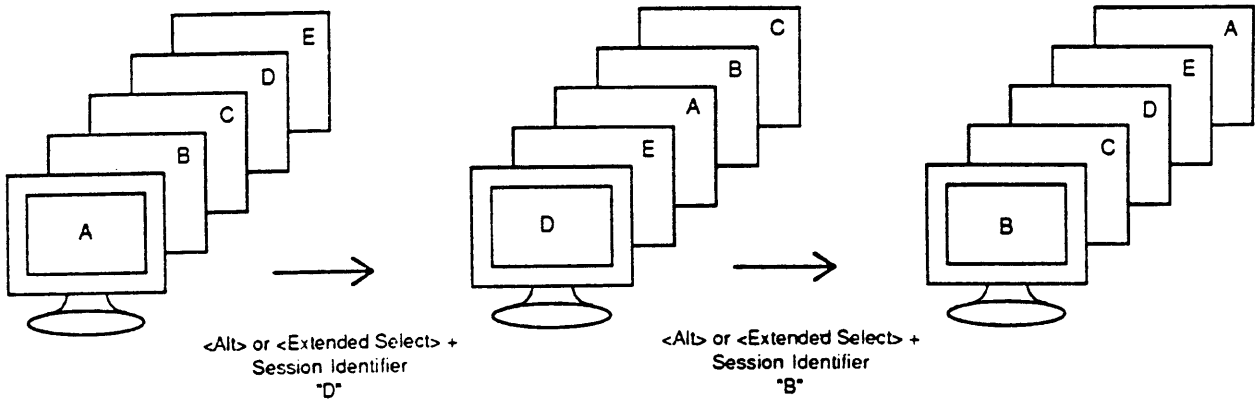


Figure 3-2. Jump Key Sequence for Specific Host Session Access

OPERATOR INFORMATION AREA

The Operator Information Area provides two types of MLT session status information:

- Active foreground session indicator
- Background session activity indicator

This chapter discusses information relevant only to MLT..

NOTE: The Operator Information Area status line does not appear on an A/A terminal interacting with an A/A host.

ACTIVE FOREGROUND SESSION INDICATOR

The active foreground session indicator shows which host session is in the active foreground session. The indicator changes when a different host session becomes the active foreground session. In the IBM mode, the active foreground session indicators are LT-1 (for the first session) through LT-5 (for the fifth session). LT stands for Logical Terminal. The Memorex Telex modes indicators are A (for the first session) through E (for the fifth session).

BACKGROUND SESSION ACTIVITY INDICATOR

A beep and/or session activity indicators notify you that application activity is occurring in a background session. Background activity does not affect the terminal screen.

A beep sounds when background activity takes place. It can be enabled or disabled on each terminal by pressing Attn.

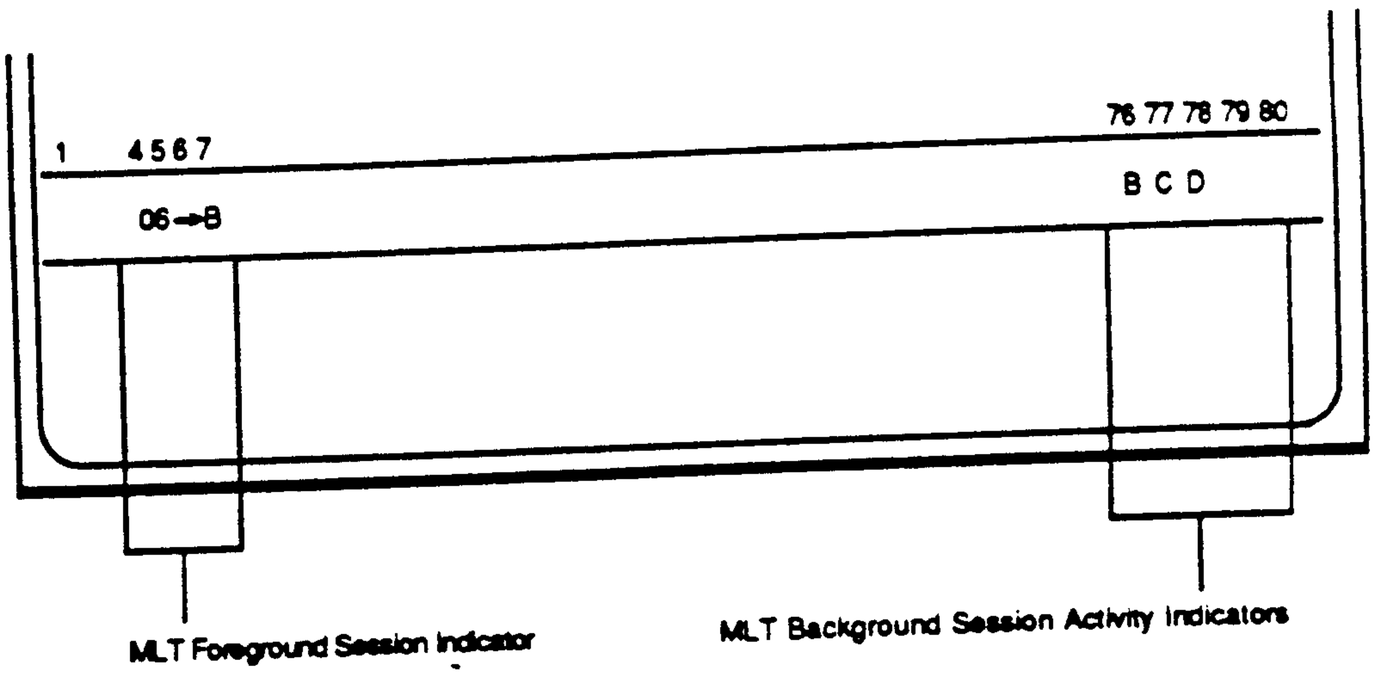


Figure 3-3. Memorex Telex Mode Operator Information Area

When activity occurs in a particular background session, its corresponding session activity indicator appears on the status line. If the terminal is in Memorex Telex mode, the activity indicators are A (for the first session) through E (for the fifth session). If the terminal is in IBM mode, the indicators are 1 through 5. The default display positions start at column 76 (see Figure 3-3). When a new foreground session is established, the session activity indicators are refreshed.

HOST SELECTION MENU

The Host Selection menu shows host session information and allows you to connect or disconnect host sessions without interrupting active sessions (see Figure 3-4). See Chapter 2, "Local Control Point," for more information on the Host Selection menu.

```
===> S
Select session number and ENTER to connect a session, use PF7/PF8 to scroll.
Select session number and PF12 to disconnect a session, use PF3 to exit.
Select a sequence letter and PF5 for exit to selected session.
-------------------------------------------------------------------------------

                          5 Concurrent Sessions Allowed

Session                                                Selection
Number      Host Name                                  Sequence     Status
  01        NEWS                                          A         Connected
  02        *HOST2          LU 1                          B         Connected
  03         HOST2          LU 2                          C         Connected
  04         HOST2          LU 3                          D         Disconnected
  05         IBM1          LU 100                                   ?
  06         ASCII1                                                 Available
  07         ASCII2                                                 Busy
  08         HOST2          LU 4                                    Disconnected
```

Figure 3-4. Host Selection Menu

FIELDS

Session Number – This field contains a number corresponding with a host name. It is used to connect or disconnect a host session.

Host Name – The hosts authorized for terminal access appear in this field. Up to 30 host names may be authorized for selection.

Selection Sequence – This sequence shows the order in which the host sessions were connected. This order determines Jump Key sequences.

Status – Host status information appears in this field.

SESSION TERMINATION

Sessions are terminated when they are disconnected at the Host Selection menu. Also, A/A host sessions terminate when the terminal is powered off. If the active foreground session is an A/A host session when the terminal is powered off, the next IBM host session in the sequence or the preferred host session appears when the terminal is powered back on again. If the active foreground session is an IBM host session when power off occurs, that session reappears when the terminal is powered on again.

PROGRAMMED SYMBOL SETS

Memorex Telex recommends that Programmed Symbol sets be used only in the first IBM host session. Error may occur if the PS sets are used in more than one IBM host session.

MEMORY REQUIREMENTS AND CONSIDERATIONS

Each concurrent session uses a certain amount of memory. Therefore, memory requirements must be considered prior to assigning the maximum number of concurrent sessions via the CO command. The control unit model, its maximum number of supported sessions, and the number and types of attached devices determine the maximum number of concurrent host sessions allowed per terminal. See Appendix G for memory tables and worksheets.

Device and Session Support Table
(All Memorex Telex Control Unit Models)

Control Unit Model	Features	Coax Devices	ASCII Devices	Total Sessions
1L	SNA Local	32	24	254
	Non-SNA Local	32	24	32
	SNA/SDLC Gateway	32	24	254
	Dual IBM Host	32	24	236
	Dual IBM Host Gateway	32	24	226
01R, & 02R	SNA/SDLC	32	24	254
	BSC	32	24	32
	X.25	32	24	198
	Dual IBM Host: SNA/SDLC	32	24	254
	Dual IBM Host: SNA/SDLC & BSC	32	24	184
	SNA/SDLC Gateway	32	24	254
03R		32	24	156
41R & 42R	SNA/SDLC	32	8	200
	BSC	32	8	32
	X.25	32	8	126
	Dual IBM Host: SNA/SDLC	32	8	200
	Dual IBM Host: SNA/SDLC & BSC	32	8	110
	SNA/SDLC Gateway	32	8	88
43R		16	8	200
51R & 52R	SNA/SDLC	16	8	120
	BSC	16	8	32
	X.25	16	8	120
	Dual IBM Host: SNA/SDLC	16	8	120
	SNA/SDLC Gateway	16	8	74
53R		16	0	80
61R	SNA/SDLC No ACS	16	0	80
	BSC No ACS	16	0	32
	X.25 No ACS	16	0	80
	SNA/SDLC With ACS	16	2	80
	BSC With ACS	16	2	32
	X.25 With ACS	16	2	80
71R & 72R	SNA/SDLC With ACS	8	2	50
	BSC With ACS	8	2	32
	X.25 With ASC	8	2	50
73R	SNA/SDLC With ACS	8	2	50

Table 3-1. Memory Requirements for the 1374 Control Units

OPERATOR INFORMATION AREA

Coax and A/A terminals with 3270 emulation use screen line 25 as an information area. The Operator Information Area does not display on A/A terminals in session with an A/A host. If the terminal screen has less than 25 lines, simultaneously press the ESC and X keys to display the Operator Information Area.

1374 Control Units support three Operator Information Area modes: IBM 3270, Memorex Telex EXTRA 1, and Memorex Telex EXTRA 2. Each mode provides status and error information for the system, terminal, terminal keyboard, and assigned printers. The modes, EXTRA 1 and EXTRA 2, also provide error messages, device port identification, response times, and screen data field characteristics. Both modes offer a descriptive display of error messages. For example, an invalid input error appears in the IBM mode as "X?+." Memorex Telex modes display the error as "X INV INPUT." EXTRA 2 mode provides row/column cursor indicators.

ACTIVATING INFORMATION AREA MODES

EXTRA 1 mode (default) appears on line 25 when the control unit is powered on. The default mode may be configured with the Configure Terminal Options (CO) command.

Press PA1 during unowned or LCP ownership to switch between Memorex Telex EXTRA 1 and the IBM modes. Press PA2 to switch between Memorex Telex EXTRA 2 and IBM modes.

System Status	Input-Inhibited Messages	Performance and Error Messages	Data Field Modes	Special Feature Status	Printer Status	Document Modes	Cursor Position	MLT Background Session Indicators
1—8	9——22	25———35	33–47	48—57	60–64	66——70	74—75	76——80

Figure 3-5. Operator Information Area – Fields

FIELDS

The 80-column information line contains nine fields: system status; input-inhibited messages; performance and error messages; keyboard and data field modes; special feature status; printer status; document modes; cursor position; and MLT background session activity indicators.

Figure 3-6 shows the Operator Information Area in the EXTRA 2 mode.

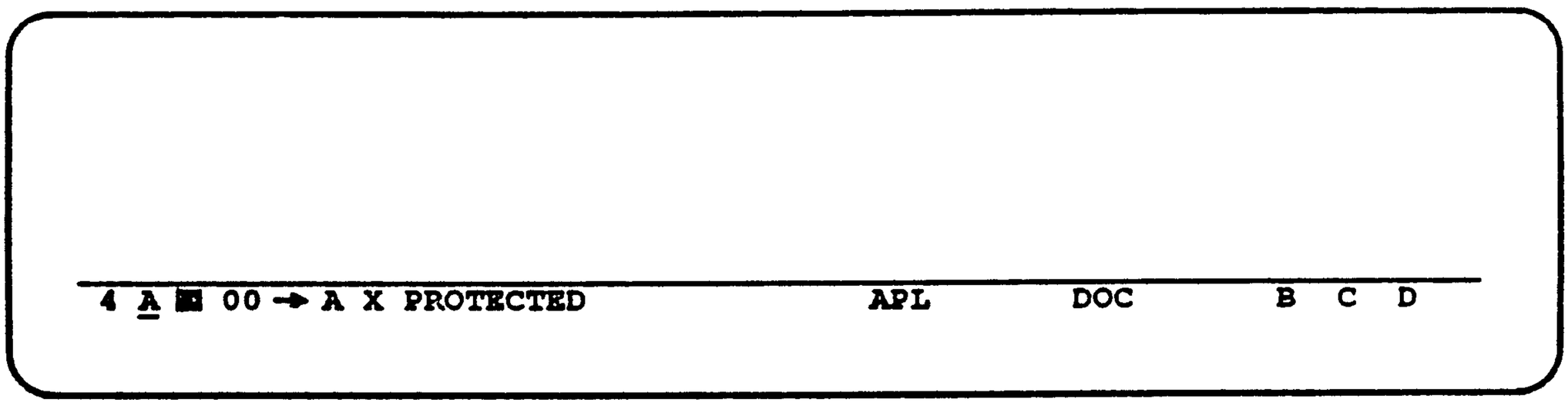


Figure 3-6. Operator Information Area – EXTRA 1 Mode

System Status – The first field of the Operator Information Area (columns 1-8) reports control unit and host status. In addition, the Memorex Telex modes provide the decimal port number of the terminal.

Col	Description	EXTRA Modes	IBM Mode
1	Control Unit Ready	4	4
2	Online, Non-SNA	A	A
	Online, SNA	B	B
	A/A Session in Progress	C	C
3	APL Control	■	■
	SSCP Control	웃	웃
	Unowned Control	⇩	⇩
4-7	Foreground Session	Port-Session ID	LT-Session ID
	LCP Control	Port-T	TEST
8	X.25 with Data Transfer	N	N

Table 3-2. System Status Field – Symbols

Input-Inhibited Messages – Some system or operator actions inhibit keyboard input. The second field (columns 9-22) displays an explanation when this occurs. The modes provide English language descriptions and the IBM mode displays symbols. Error codes (nnn) for machine, communication, and program checks are listed in Appendix B, "Check Error Codes." Press Reset to unlock the keyboard when an input-inhibited condition occurs.

Col	Description	EXTRA Modes	IBM Mode
9-22	Time Required	X	X
	Printer Busy	X	X
	Printer Inoperable	X	X
	Printer Very Busy	X	X
	Security Key	X SECURITY KEY	X
	Numeric Only	X NUMERIC ONLY	X NUM
	Invalid Number	X INV NUMBER	X #?
	Invalid Function	X INV FUNCTION	X - f
	Invalid Input	X INV INPUT	X ? +
	Operator Unauth.	X NOT AUTHRZD	X X
	Protected Field	X PROTECTED	X
	Full Field	X FULL FIELD	X >
	Machine Check	X MACH CHK nnn	X nnn
	Host Link Error	X COMM CHK nnn	X nnn
	Programming Error	X PROG CHK nnn	X PROGnnn
	Locked by Systems	X SYSTEM LOCK	X SYSTEMS
	Symbol Not Available	X INV FEATURE	X - f
	Dead Key Error	X DEAD KEY ERR	X + ?
	Control Operator Msg.	X CONTROL MSG	X
	Invalid MSR Data	X INV MSR DATA	X
	Invalid Key Data	X INV KEY DATA	X - S
	System Resource	X SYSTEM RESOURCE	X SYS MEM

Table 3-3. Input-Inhibited Field – Messages

Performance and Error Messages – Host communication errors are reported in columns 25-35. EXTRA modes also use an error descriptor, LINK. Error codes (nnn) are listed in Appendix B.

This field also displays transaction response times when error messages are not displayed.

When dual IBM hosts are supported, this field shows the LU session number and the active IBM host number. For example, LU:004/1 indicates the terminal is in LU (host address) session 004 with IBM host 1. A host designation of 2 appears only when dual IBM hosts are supported. LU numbers (NNN) may be between 2 and 255 for SNA, and 0 and 31 for non-SNA systems. Host numbers (h) may be 1 or 2.

LTTI (last transaction time indicator) displays in seconds and tenths of a second (ss.t). If the time is greater than 99.9 seconds, it appears as *0.0 (EXTRA) or () m.ss (IBM).

Col	Description	EXTRA Modes	IBM Mode
25-35	Comm Link Error	LINK h/nnn	~Z_ nnn
	LTTI	RTM:ss.t	():ss.t
	Host Link	LU:NNN/h	N/A
	Logical Unit ID	LU:xxx	LU:xxx

Table 3-4. Performance and Error Field – Messages

Keyboard and Data Field Modes – Symbols for keyboard and data field modes are displayed in columns 37 through 47.

Col	Description	EXTRA Modes	IBM Mode
37	Insert	^	^
39	Upshift	⇑	⇑
40	Caps Lock	A	A (IBM Col. 43)
41	Modified	*	N/A
42	Light Pen	⌑	N/A
43-45	Numeric	NUM	NUM
	Modifiable Field	____	N/A
	Protected Field	o—m	N/A
47	Ext. Select (3179)	▶	▶

Table 3-5. Keyboard and Data Field Modes – Symbols

Special Feature Status – This field (columns 48-57) gives the status of 3270 Structured Field and Attribute Processing features, which include character sets, color, and highlighting functions. Terminals with these features allow you to select the desired attributes using special program keys.

The character set features are determined by the keyboard type. APL or TEXT characters are available on special keyboards. Program symbol (PS) sets are customized by the applications program. The base symbol set (S0) for keyboards with the program symbol option is the basic typewriter character set.

Color monitors have color options under application program control, which allow for selection. Highlighting modes may also be available for selection.

Col	Description	EXTRA Modes	IBM Mode
48-50	Base Symbol Set	SO	SO
	Prog. Symbol Set A	PSA	PSA
	Prog. Symbol Set B	PSB	PSB
	Prog. Symbol Set C	PSC	PSC
	Prog. Symbol Set D	PSD	PSD
	Prog. Symbol Set E	PSE	PSE
	Prog. Symbol Set F	PSF	PSF
51	Option Available		
	Option Available		
48-50	APL Char. Set	APL	APL
48-51	TEXT Char. Set	TEXT	TEXT
	Alpha Char. Set	ALPH	ALPH
	Katakana Char. Set		

Table 3-6. Special Features Status Field – Character Set

Col	Description	EXTRA Modes	IBM Mode
54	Option Available		
53, 54	Option Selected		

Table 3-7. Special Features Status Field – Color

Col	Description	EXTRA Modes	IBM Mode
56	Blinking		
	Underlining		
	Reverse Video		
57	Option Available		
	Option Selected		

Table 3-8. Special Features Status Field – Highlighting

These special features are available when the option available symbol appears next to the feature symbol. Select the features via the attribute selection keys. When the feature is selected, the option selected symbol appears.

Refer to the documentation for the IBM or IBM-compatible terminal for specific instructions on using these features.

Printer Status – Columns 60-64 of the Operator Information Area indicate terminal printer status. Printer port numbers (nn) may be 0-31.

For "authorized printer," these numbers (nn) may also indicate classes.

Col	Description	EXTRA Modes	IBM Mode
60-64	Authorized Printer	□—□ nn	□—□ nn
	Printer Printing	□—■ nn	□—■ nn
	Assign Printer	□—□ __	□—□ __
	Printer Failed	□—■ nn	□—■ nn

Table 3-9. Printer Status Field

Document Modes – Columns 66-71 display document modes when the Entry Assist feature is initiated.

Col	Description	EXTRA Modes	IBM Mode
66-68	Document Mode	DOC	DOC
71	Word Wrap Mode	⇓	⇓

Table 3-10. Document Modes Fields

Cursor Position – The cursor line/column location appears in EXTRA 2 mode only.

Col	Description	EXTRA Modes	IBM Mode
74-76	Line (1 Maximum)	xx/	N/A

Table 3-11. Cursor Position Field

MLT background session activity indicators. Columns 76-80 show active background session indicators. When activity occurs in an active background session, its corresponding indicator displays.

Col	Description	EXTRA Modes	IBM Mode
76-80	Background Session Activity Indicator	A through E	1 through 5

Table 3-12. MLT Background Session Activity Indicators

OPERATOR ENTRY ASSIST

1374 Control Units support Operator Entry Assist, which provides formatting and editing capabilities for terminals. It is functionally identical to IBM's 3270 Entry Assist.

Operator Entry Assist provides:

- Format scale line for screen margins
- Tabbing
- Audible "end-of-line" signal
- Word wrap
- Word advance and word return cursor functions
- Word delete
- Character delete
- Error-correcting backspace when in insert mode
- Cursor position appear on demand

Operator Entry Assist is supported for IBM 3178, 3179, 3180, 3278, and 3279 terminals. Key use is slightly different for each keyboard type. Entry Assist may be used with most IBM editors and text formatters, such as SPF and XEDIT, with some limitations. Refer to related IBM documentation for more information.

NOTE: The following foreign language keyboard codes do not support Entry Assist: 06, 08, 10, 11, 12, 13, 20, 26, 27, and 43.

SELECTING ENTRY ASSIST

Operator Entry Assist (or document mode) is selected by pressing the DOC On/Off key. Figures 3-7 through 3-9 show the location of this key on different keyboards.

NOTE: For IBM 3179 terminals in native mode, the Ex Sel key must be pressed first to place the unit in extended select mode.

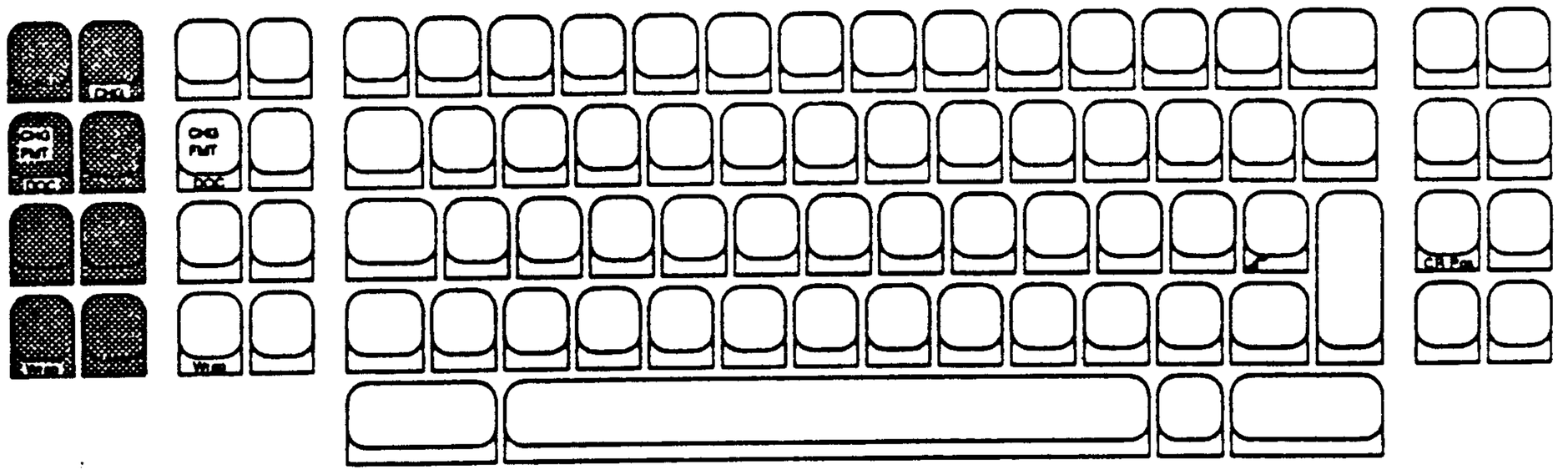


Figure 3-7. IBM 3178/3278/3279 Document Mode Keys (Shaded Areas Show RPQ C3 Keyboard)

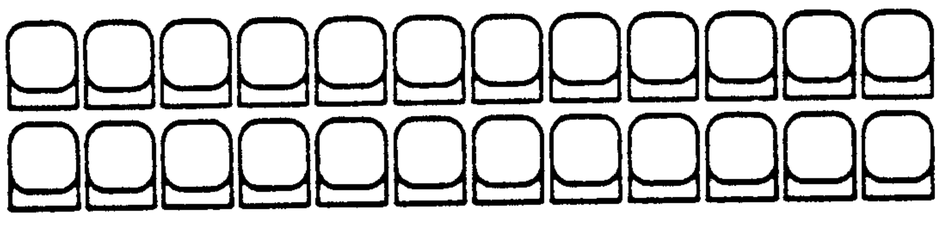


Figure 3-8. IBM 3179/3180 (Emulate) Document Mode Keys

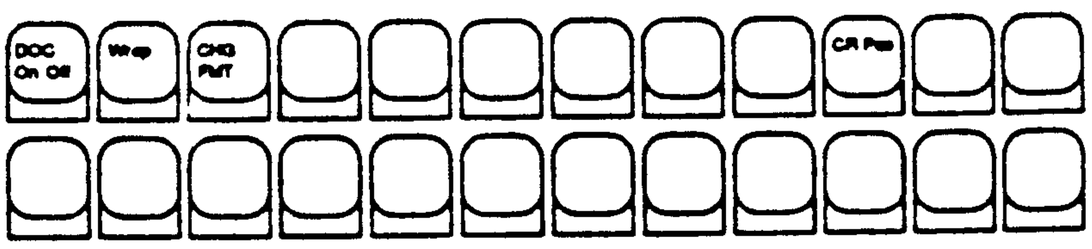


Figure 3-9. IBM 3179 (Native) Document Mode Keys

When the DOC On/Off key is pressed to initiate the document mode, the characters "DOC" appear in columns 66-70 of the information area. To exit Entry Assist, press DOC On/Off again, and the "DOC" designation disappears from the screen.

NOTE: Some non-IBM terminals overwrite the DOC area with cursor line/column indicators.

SCREEN FORMAT

The default screen format for document mode includes the following specifications:

- Margins – 0 to 79
- Tabs – None
- Audible Signal – Off
- Word Wrap – On

To change these formats, press the Chg Fmt key to enter format mode, which provides a scale line to set document format. Figures 3-10 through 3-12 show the location of the Chg Fmt key and other keys used to set the format.

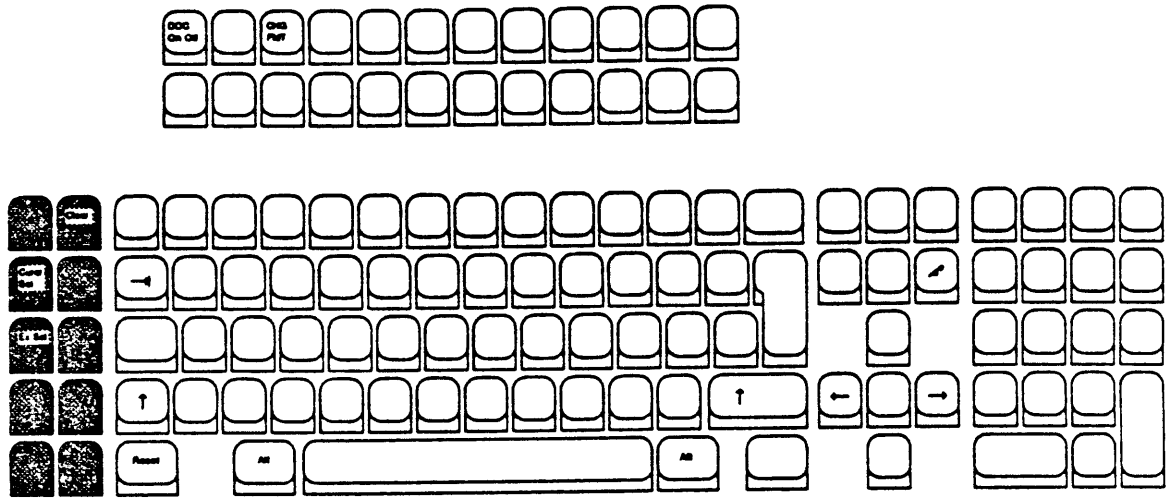
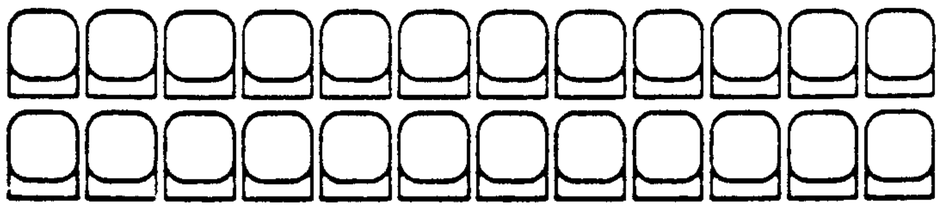


Figure 3-10. IBM 3178/3278/3279 Format Mode Keys (Shaded Areas Show RPQ C3 Keyboard)



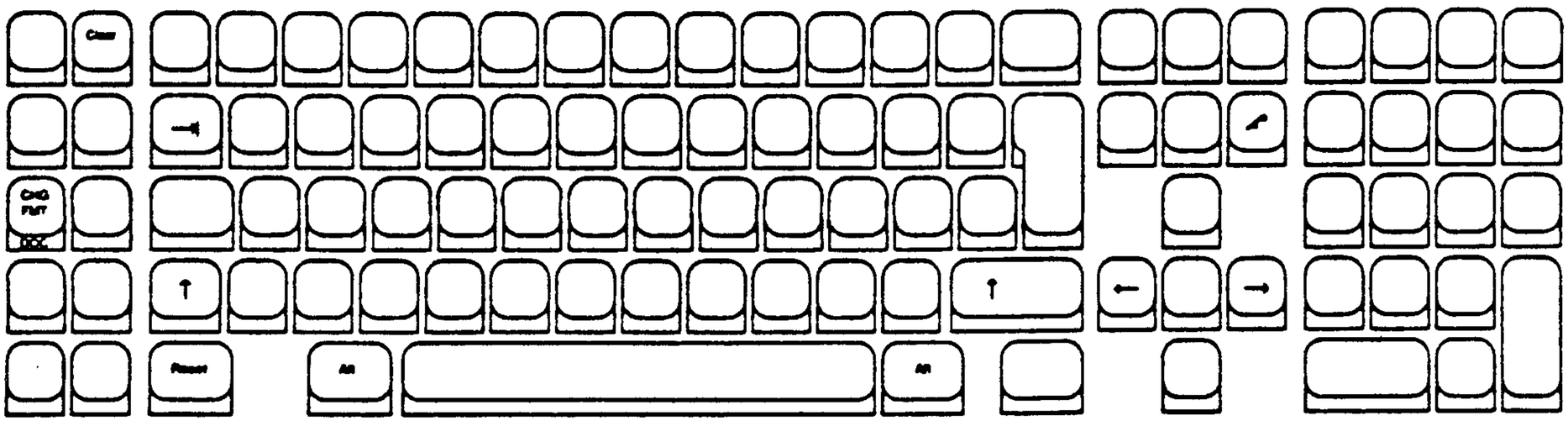
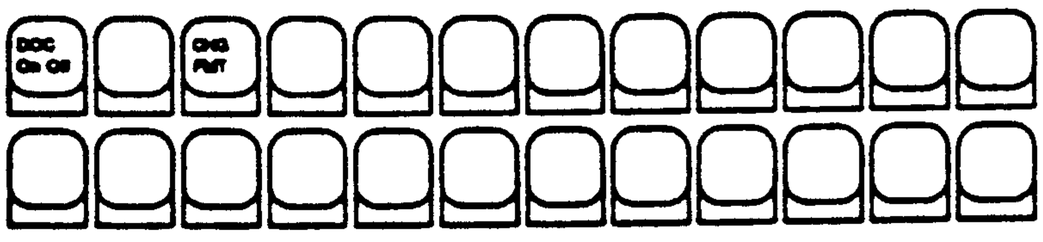


Figure 3-11. IBM 3179/3180 (Emulate) Format Mode Keys



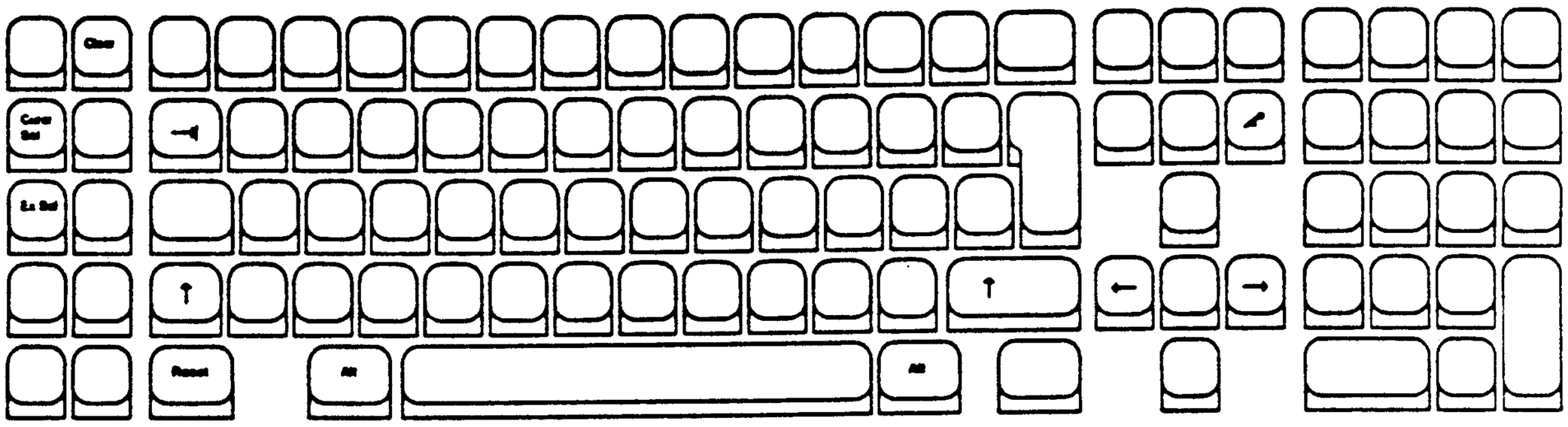


Figure 3-12. IBM 3179 (Native) Format Mode Keys

The format mode scale line appears over the Operator Information Area (see Figure 3-13). A special cursor on this line indicates the current position of the text cursor. Margins, tabs, and the end-of-line indicator may now be modified. The new settings remain in effect until they are changed, or when the control unit is powered off.

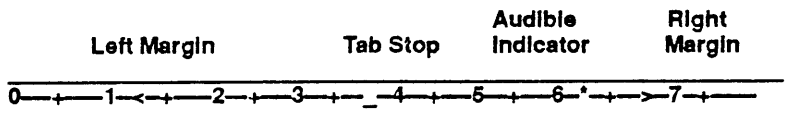


Figure 3-13. Entry Assist Scale Line

The only entries permitted during format mode are scale line adjustments. Document text cannot be entered. To exit format mode, press the Chg Fmt key again, and the screen will return to document mode.

MARGINS

To set the left margin, move the cursor to the desired location, using the Cursor Right or Cursor Left key, and press the less than symbol (<). To set the right margin, move the cursor to the desired location and press the greater than symbol (>). The column defined as the left margin is included in the entry area. But, the column defined as the right margin is not included in the entry area.

ALTERNATIVE RIGHT MARGIN

An alternative right margin causes a margin release to occur at the right margin when word wrap is off. Otherwise, input is inhibited when character entry is attempted. To establish an alternative right margin, place the cursor on the right margin symbol and press the Cursor Select key. The standard right margin symbol (>) will be replaced with a broken vertical bar (|).

To remove the alternative right margin, press the Cursor Select key a second time.

TAB STOPS

To set a tab, place the cursor at the desired position and press the Forward Tab key (⟶|). The new tab stop is indicated by an underscore (_). If a margin or end-of-line signal has been set at the same position, the underscore will not appear.

To clear a tab, place the cursor at the tab stop and press the Delete Character key ( ). To clear all tabs, press the Clear key.

AUDIBLE END-OF-LINE SIGNAL

To set the end-of-line signal, place the cursor in the desired column position and press the Asterisk key (*). An asterisk symbol appears at that position. To clear the end-of-line signal, place the cursor at the end-of-line signal setting and press Delete Character.

CHANGING SCALE LINE ORIGIN

To change the scale line origin (0 or 1), place the cursor at the first scale line position and press the Cursor Select key. If the origin is currently 0, it will change to 1 -- and vice versa. Margins and tabs remain in the same position; their position numbers change as required.

ENTRY ASSIST FUNCTIONS

WORD WRAP

Word wrap allows text to continue ("wrap") from a full line to the next line without using the New Line key (↵). When document mode is activated, word wrap is turned on automatically and the word wrap symbol (⇩) appears in column 71 of the information area. To turn word wrap off, press Wrap, and the arrow disappears.

If inserted characters cause a word to extend beyond the right margin, the word will wrap to the next line if space is available. If the left margin is within an unprotected field, nulls to the left of the left margin within that field are changed to spaces.

Key input will be inhibited if any of the following conditions occur:

- A word occupies an entire row.
- The current row is the last row.
- The new line is protected or full.

These conditions cause a "Full Field" message in the information area. Press the Reset key to clear this condition.

MOVE CURSOR TO NEXT WORD

Press the Alt and Cursor Right key (→) simultaneously to move the cursor to the first character of the next word. If the cursor is within the last word on a line within margins, it moves to the first null or blank after that word.

This function ignores margin settings. If a word is located outside the current margin settings, the cursor will move to it. If there are no more words in the current row, the cursor will move to the first word of the next row.

MOVE CURSOR TO PREVIOUS WORD

Press the Alt and Cursor Left key (←) simultaneously to move the cursor to the first character of the current word. If the cursor is at the first position of the current word, or is not positioned under a word, the cursor is positioned at the first location of the previous word. If there are no words to the left of the cursor, the cursor moves to the last word of the previous row.

DELETE WORD

Press the Delete Word key to delete characters from the current cursor position to the end of the word. The following words are shifted left to close the gap. Punctuation and the space or null following a word will be deleted; for a partial word delete, the following null or space is not deleted.

DELETE CHARACTERS

To delete characters, press the Alt and Left/Right Braces keys ({ }) simultaneously. The character at the cursor position is deleted.

While in document mode on an 87-key keyboard (IBM 3178/3278/3279) or in emulation mode on a 122-key keyboard (IBM 3179/3180), an additional delete is defined that repeats if held down. To repeatedly delete characters on these keyboards, simultaneously press the Alt and Left/Right Brace keys ({ }) and hold them down. The normal Delete key on IBM 3179/3180 keyboards automatically repeats if held down.

ENHANCED CURSOR TAB

Press the Forward Tab key to move the cursor to the next unprotected tab stop or the start of an unprotected field, whichever comes first. Unprotected null characters will be replaced with space characters if a tab stop comes first.

NOTE: While in document mode with tab stops set, the Tab key introduces space characters into the data stream sent to the host program. See "Programming Considerations" later in this chapter for information.

ENHANCED CURSOR BACKTAB

Press the Cursor Backtab key (←) to move the cursor to the previous tab stop, or to the first unprotected character location of the field, whichever is closer. Nulls are not changed to spaces during the move.

ERROR CORRECTING BACKSPACE

Press the Backspace key while in insert mode to delete the character to the left of the cursor position (unless the cursor is at the left margin). The cursor moves left one position, and all characters to the right of the deleted character are shifted to close the gap, regardless of the right margin setting.

ENHANCED NEW LINE

The New Line key places the cursor at the left margin of the new line, or at the first unprotected position to the right of the left margin within the entry area.

CURSOR POSITION INDICATOR

Press the Cursor Position key to display the current position of the cursor in columns 74-79 of the Operator Information Area. The row number will be 1-43 and the column will be 1-80. The indicator is reset when another key or Alt is pressed.

PROGRAMMING CONSIDERATIONS

Entry Assist inserts spaces into the data stream to preserve the screen format and the subsequent printed output. Some programs may not properly interpret the added spaces and should not be used with Entry Assist.

The following Entry Assist functions cause spaces to be inserted into the data stream:

- New line operations insert spaces to replace nulls in unprotected field positions from the left margin of the new line leftward to a field attribute or column number 1, whichever occurs first.

- Forward tab operations cause spaces to be inserted in unprotected field positions containing nulls up to the next tab stop. No spaces are inserted if the next stop is the first character after an unprotected attribute.

- Word wrap operations insert spaces in the character positions from which characters have been moved to the next line.

ADDITIONAL TERMINAL FUNCTIONS

TYPE AHEAD FEATURE

This feature is active during EXTRA Operator Information Area modes for 3270 terminals, A/A terminals and PCs. Up to 28 characters may be typed while the terminal is in a busy condition. An audible signal sounds when the buffer is full.

NOTE: Any characters that exceed the 28-character limit are discarded.

During this operation, no echoing of the graphic data is performed. When the keyboard is reenabled by the host program, the Type Ahead characters are processed. To discard these characters, press the Reset key.

TERMINAL ALARM BUZZER

From each coax or A/A terminal, you can enable or disable the terminal's alarm buzzer. The alarm defaults to enable. While the terminal is in the unowned or test state, press Attn to disable the alarm buzzer. Access LCP and issue the Write Configuration command to update the system diskette with this change. To reenable the alarm buzzer, access the unowned or test state, and press Attn. An alarm sounds when the buzzer is enabled; it does not sound when the buzzer is disabled.

PA3 KEY SUPPORT

The 1374 Control Units support PA3 on 102-key and 122-key typewriter keyboards. PA3 allows a third program attention key to be supported by an application.

On a 102-key keyboards, PA3 is located on the upper shift position of PA1. On 122-key keyboards, PA3 is located to the immediate right of PA2.

Pressing PA3 on some systems may cause undetermined action. Remove this key function with the SDU Modify Existing Keyboard selection under Option 3, Define Keyboards.

UNBIND AT POWER OFF

If the control unit detects a coax device has powered off, the control unit clears that configured port making the coax port available for reconfiguration. For complete information contact your customer support representative.

Chapter 4

Troubleshooting

TROUBLESHOOTING

INTRODUCTION

Several 1374 features can be used to quickly isolate and resolve subsystem problems:

- LCP terminal status displays and tests
- Control unit control panel indicators
- Control unit diagnostics (power on testing)
- Operator Information Area
- Netview support

These tools constitute the first level of problem isolation and will usually pinpoint the problem level (device, control unit, communications, or host). If you suspect a control unit failure, contact your service representative.

LCP SUPPORT

Two LCP Display commands provide terminal feature, statistical, and error data that can isolate configuration and subsystem problems. Two other commands supply Monitor testing patterns.

The Display Ports (DP) screen can be used to verify the correct status and features of attached devices (see Figure 4-1).

NOTE: Screens may vary according to model and options.

An attached device cannot communicate with the system if the device is listed as not available, or is not listed at all.

A device listed as not available ("N" under the AVL column) was previously connected and powered up, but currently is not physically attached and/or turned on.

A blank line after the port number indicates the control unit has not recognized any devices attached since the last IML or the control unit has disconnected the device because of a problem.

The Display Terminal (DT) screen provides extensive statistical information about the operation of any attached device (see Figure 4-2).

```
===> DP
Enter new command option, or use PF3 to exit, or use PF7/8 to scroll
------------------------------------------------------------------------------
                                        NUM   LT   MHS          PS   APL
PORT  TYPE  AVL  SIZE  KEYBOARD        LOCK  PEN  MSR  COLOR   SET  TXT  SCS
00    dsp    Y   2560  config
01    dsp+   N   1920  typewriter      Y
02    dft    Y   4096
03
04    dsp    N   1920  typewriter      Y     Y           Y
05    dsp    Y   1920  typewriter      Y     Y           Y
06    dsp    Y   2560  typewriter      Y     Y     Y
07
08
09
10
11    dsp*   N   2560  typewriter      Y
12
13
14
15
16
```

Figure 4-1. Display Ports Screen

```
===> DT 03 R S1
Enter new command, or use PF3 to exit, or PF7/8 to display next port
------------------------------------------------------------------------------
                                        NUM   LT   MSH          PS    APL
PORT  TYPE  AVL  SIZE  KEYBOARD        LOCK  PEN  MSR  COLOR   SETS  TXT  SCS
03    dsp    Y   1920  typewriter      Y     Y

OWNER  APPL  SSCP  TEST  READY  PRT  ASSIGN  RTM  EN  RTM  DEF  LU  ASSIGNS
LU     2     Y           Y                     Y   *0        05  45

              APPL    SSCP    LCP
MSGS TO:        46       5      1
CHRS TO:      1627      61      5
MSGS FM:       120       5      1
CHRS FM:    189022     109   1042

             2XX  3XX  4XX  5XX  CNT1  CNT2  CNT3  CNT4  CNT5  CNT6
ERR COUNT:     0    0    6    1     0     2     0     0     0     0
ERR LAST:                 432  505

KEYS IN:  464        SESSIONS: 1              AVG RT: 1.2

RTM:  CTR1  CTR2  CTR3  CTR4  OVFL  BNDRY1  BNDRY2  BNDRY3  BNDRY4
        2    38     4     1     1    *1.0     2.0     5.0    10.0
```

Figure 4-2. Display Terminal Screen

Error counters 2XX, 3XX, 4XX, and 5XX indicate the total number of errors plus the last error code associated with the 1374 Control Unit port. Refer to Appendix B for specifics.

The six counters CNT1-CNT6 indicate specific error totals since the last reset or IML:

CNT1 – Device time-outs
CNT2 – Device parity errors
CNT3 – Power off/on at terminal
CNT4 – Device buffer parity checks
CNT5 – Terminal basic errors
CNT6 – Terminal feature errors

(Counters CNT1 and CNT3 normally increment together when a terminal is powered off.)

Usually these errors indicate device problems; however, control unit port hardware could also be suspect. To isolate the problem, move a device cable from one port to another to verify device failure at both locations. If the problem moves as well, the device or attached cable is at fault. If the problem remains with the port, the control unit is causing the failure.

The LCP test commands include Echo and Test. The Echo command fills the screen with an operator defined character pattern. This test verifies keyboard and screen output by writing to most positions in the screen buffer. The Test command supplies the standard IBM test to verify the device-to-control unit communication path.

1374 DIAGNOSTICS

POWER-ON TESTING

During power on or IML, 1374 Control Units initiate a series of tests to verify the operation of hardware subsystems. When power on tests are successfully completed, the control unit is initialized for operation.

The control unit performs a series of diagnostic tests when powered on. If any self-diagnostic fails, the power on test will halt. If the diagnostics are successfully completed, the control unit loads the system diskette software.

After the power on switch or IML button is pressed, the following events occur if the control unit is working correctly.

- "P080" then "P081" codes display momentarily on the front panel indicator on most models. This signifies the self-testing process.

- The disk drive indicator lights and the diskette loads software into 1374 memory.

- After about a minute, the access light turns off and the control unit is operational.

Any code remaining in the front panel indicators during testing or operation signals a failure. Contact a service representative to correct the error condition.

COMPREHENSIVE TESTING

A second set of diagnostics is used for comprehensive testing of 1374 Control Units. These tests are loaded from a special diskette and monitored from an on site or remote display terminal. service representatives use these diagnostics to isolate control unit failures.

DUMP DISKETTE

A dump diskette is a useful diagnostic tool in case of system failure. To use, insert the diskette in place of the system diskette while the control unit is running. If a failure does occur, current memory will be dumped to the diskette, providing information useful in tracing errors. If you need a dump diskette to isolate a problem, contact your service representative.

OPERATOR INFORMATION AREA ERROR CODES

1374 Control Units support IBM-type error codes in the Operator Information Area, alerting the operator to three types of errors: Machine Check, Program Check, and Communication Check.

MACHINE CHECK

Machine Check error codes describe terminal or host connection failures. 200-level codes indicate terminal or printer errors. 300-level codes indicate control unit errors.

PROGRAM CHECK

Program Check error codes are 400-level numbers indicating that the host system has sent invalid commands or data streams to the control unit, or that the control unit and its attached devices cannot support the command or commands within the data stream.

COMMUNICATION CHECK

Communication Check 500-, 600-, and 700-level error codes indicate that the communication paths are not established or operating. These error codes may also indicate protocol violations or a host-initiated reset.

ERROR CODE LISTING

Appendix B lists all line error codes, describes the condition, and recommends specific operator action to correct the problem.

NETVIEW SUPPORT

Memorex Telex control units support NetView, an IBM program to assist service representatives in isolating and resolving terminal subsystem problems. NetView operates with VTAM and TCAM for SNA and local non-SNA control units. Refer to IBM documentation for operation information.

PROBLEM ISOLATION PROCEDURES

Table 4-1 lists symptoms and solutions of possible device or control unit problems during power on testing and IML.

If a problem occurs after the unit has completed initialization, record symptoms before attempting re-IML or reset. Contact your service representative if problems persist.

Symptoms	Possible Problem	Solutions
No indicators lit; diskette not loading	Power switches and controls	Check power switch/fuse in rear; power cable connections.
Error message stays on 1374 control panel	L messages – diskette load problems	Check diskette.
	P, H, and E messages – hardware problems	Contact service representative.
1374 loads; Operator Information Area does not display on screen	Device not recognized by control unit	Power off/on device.
	Control unit configuration	Check port configuration with LCP.
	Device connections	Correct physical connection.
	Device malfunction	
Information appears in Information Area; Link error is displayed	Host configuration incomplete	Check with system administrator.
	Control unit configuration incorrect	Check host configuration in LCP for correct host address and parameters.
	Other communications problems	See Appendix B, "Check Error Codes."
Green power indicator lamp not lit; diskette not loading; fan not running	Control unit problem	Check power switch/fuse in rear; power cable connections.
Fan runs; green power indicator lamp goes out and stays out	Diskette load problems	Check diskette and drive latch position.
	Hardware problem	Contact service representative.

Table 4-1. 1374 Isolation Procedures

Before notifying your service representative about subsystem failures, use the problem isolation aids and procedures described in this section to isolate the problem to the device, control unit, communication, or host level. Be alert to the timing and symptoms of the failure.