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# IBM 3270 Information Display System

## Entry Assist User's Guide

IBM 3274 Control Unit

System

**Second Edition (March 1984)**

This revision obsoletes GA23-0119-0.

# Preface

This publication describes the capabilities and use of the 3274 Control Unit Entry Assist function. This version of Entry Assist operates only on a 3274 Control Unit equipped with Configuration Support D. The procedure for enabling Entry Assist is detailed in the *IBM 3270 Information Display System: 3274 Control Unit Customizing Guide,* GA23-0065.

The Entry Assist capabilities (Section 3) are described in two groupings: formatting operations and cursor/editing operations.

The use of Entry Assist with selected currently available host editor programs is described in Section 4. Other application hints are also provided.

Section 5 contains an Entry Assist tutorial for self-teaching.

Appendix A lists the display units that can be used with the 3274 Control Unit Entry Assist function.

A list of abbreviations used in this publication follows Appendix A.

# Contents

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# Section 1. Overview

The 3274 Control Unit Entry Assist function provides attached eligible display units with new capabilities for limited local format, entry, and edit control when operating with one of the IBM host editors listed under heading 1.3. The 3274 Entry Assist function provides conveniences and productivity improvements for 3270 operators in applications involving the entry and editing of text material; for example:

- Office correspondence, such as letters, memos, reports, lists, and schedules
- Formal publications, such as books, magazines, and brochures
- Source program material, such as COBOL, FORTRAN, and assembler language source program statements
- Job control language (JCL) statements
- Other text material normally handled by the listed host editors.

Potential users of Entry Assist include secretaries, administrative personnel, clerical personnel, executives, managers, planners, engineers, writers, programmers, and, in general, anyone using 3270 displays for text-related activity.

## 1.1 Description

The 3274 Entry Assist function provides the following operator-activated capabilities:

- Display of an 'on-demand scale' line for establishing margins, tab stops, and an 'end of line' signal position
- Screen margins
- Tabbing
- Audible 'end of line' signal
- Word wrap (automatic new line)
- Typematic forward and reverse cursor movement by word (word advance, word return)

- Word delete
- Typematic character delete
- Typematic error-correcting backspace when in insert mode
- On-demand cursor position display.

The Entry Assist capabilities are made available at the display terminal when the operator selects them by pressing the Document On/Off (DOC ON OFF) key on the attached keyboard.[1] This action establishes *document mode*. To establish, check the status of, or change the setting of format controls, the operator must first establish *change format mode*. The operator establishes change format mode by pressing the Change Format (CHG FMT) key. (Another pressing of the key turns off change format mode.) When the terminal is in change format mode, the operator can check the status of, or set, margins, tab stops, and audible 'end of line' signal positions according to the needs of the job to be done. A "scale line" is used in establishing these line format parameters, providing a visual indication of their position on the line. The scale line is viewable only in change format mode.

With line formats established, the operator disables the change format mode and is now ready to execute text entry/edit; for example, enter a letter into the system. The body of the input material is automatically confined within the margins. The audible 'end of line' signal serves the same purpose as on a typewriter—it warns the operator of the need to perform a new-line operation. For many applications, however, a *word wrap* facility provides an automatic new-line operation, automatically moving partially typed words to the next line, provided the next line contains only nulls or spaces. The word wrap facility allows an operator to type without considering the need for executing new-line operations.

If columns of numbers or words are to be entered, the Tab key positions the cursor to the next tab stop, replacing unprotected null characters with space characters. This allows for rapid entry of tabular material.

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1 For the 3179 and 3180 Display Stations in *native mode*, you must first place the unit in extended-select mode by pressing the EX SEL key.

**Note:** The Tab key positions the cursor to the next unprotected field if there are no intervening tab stops. Nulls are not changed to spaces in this operation.

To facilitate editing tasks, rapid cursor positioning and improved delete capabilities are available. The cursor may be moved to the next or previous word with a single keystroke. It may also be positioned to the next or previous tab stop with a single keystroke. Both capabilities are typematic, allowing rapid positioning of the cursor anywhere on the screen. The new delete capabilities are a word delete, which deletes from the current cursor position to the end of the word; a typematic single-character delete, which supplements the current nontypematic single-character delete; and a typematic single-character backspace delete while in insert mode.

The On-Demand Cursor Position indicator causes the position of the cursor to be displayed in the operator information area in rr/cc form, where rr and cc are row and column numbers, respectively.

**Note:** When a document is created by use of Entry Assist's formatting facilities (margins, tabs), it cannot be automatically reformatted at a later time by the simple changing of an Entry Assist format control. (See heading 4.2.6 for further discussion.)

## 1.2 Prerequisites

The 3274 Entry Assist function is available on the display units identified in Appendix A when these displays are attached to an IBM 3274 Control Unit configured for Configuration Support D and customized to enable Entry Assist.

The 3274 Entry Assist function is supported on typewriter, APL, and RPQ 8K1038 keyboard layouts only. Some keyboard keytops need to be replaced with new keytops or relabeled with stick-on labels to identify the unique Entry Assist capabilities. (See Section 2 for installation instructions.) Users can purchase an Entry Assist Keytop Replacement and Accessory Kit (for 3278 and 3279 keyboards) containing eight sets of five replacement keytops and a keytop extractor tool.

The *audible alarm* feature is required on the 3278 and 3279 displays to implement the audible 'end of line' signal capability.

## 1.3 IBM Host Editor Programs

The 3274 Entry Assist function is intended for use primarily with the existing full-screen host editor programs listed below.

*Interactive Systems Editor Programs*

Under VM/SP (5749-010 VM/370, Release 6 and beyond)

- PROFS PRPQ Editor
- XEDIT
- SPF, ISPF/PDF (edit functions)

Under VM/370 (5749-010 VM/370)

- SPF, ISPF/PDF (edit functions)
- Display Editing System (IUP 5796-PJP)

Under DOS VSE/ICCF

- ICCF Editor

Under TSO

- SPF, ISPF/PDF (edit functions)

*DBDC Systems Editor Programs*

Under CICS/VS

- IPDT VSE (edit functions)
- IPDT OS/VS (edit functions)

Under IMS/VS

- IPDT OS/VS (edit functions)

*8100 Systems Editor Programs*

- DPPX Editor

**Notes:**

1. Not all the capabilities of 3274 Entry Assist are uniformly useful with all the host editors listed above. Individual preference, usage patterns, and different program design and capabilities will determine which capabilities of Entry Assist are applicable in a given environment. See Section 4 for details on Entry Assist usage with various host editor programs.

2. 3274 Entry Assist does not introduce any changes to the 3270 data stream formats. Data is introduced into the data stream in the following cases:

   a. On new-line operations, spaces are inserted 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.

   b. On forward-tab operations, spaces are inserted in unprotected field positions up to the next tab stop. No spaces are inserted if the next stop is the first character after an unprotected attribute.

   c. On word-wrap operations, spaces are inserted in the character positions from which characters have been moved to the next line.

   The intent in the above cases is to preserve the screen format in the data stream and subsequent printed output.

# Section 2. Installation

To install the 3274 Entry Assist function requires three actions:

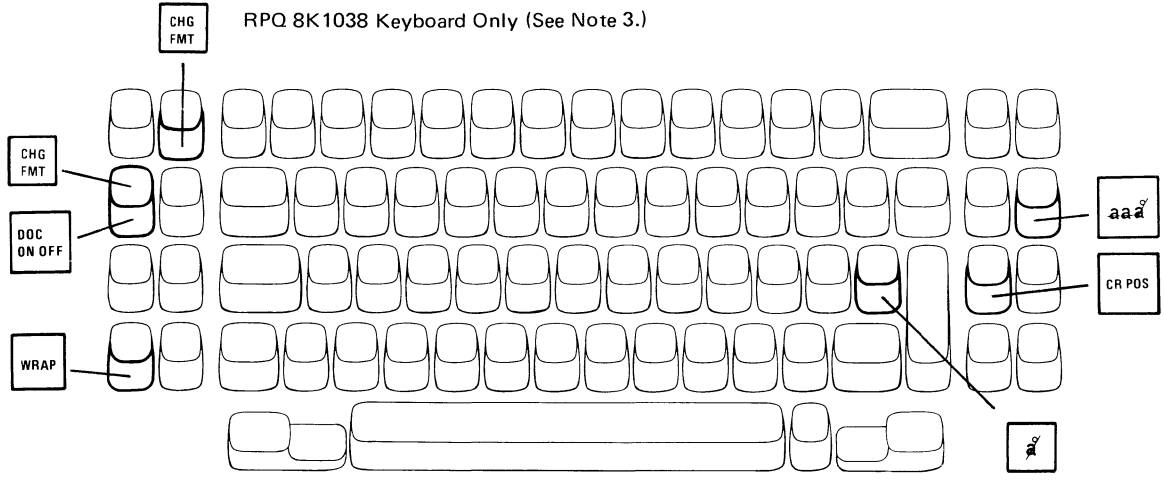
- The 3274 Control Unit with Configuration Support D must be customized to enable the Entry Assist function. See the *3274 Control Unit Customizing Guide*, GA23-0065, for the procedure to follow.

- Stick-on labels (32 sets of six labels, which are shipped with the control unit) must be affixed to attached keyboards. Alternatively, replacement keytops (which can be ordered) can be used on the 3278 and 3279 keyboards.

- If the RPQ 8K1038 keyboard is to be used, RPQ 8K1230 or 8K1231 must be installed.

If used, the stick-on labels (GX23-0230) supplied with Configuration Support D control units must be affixed to the keyboard keytops as indicated by the bold-outlined blocks in Figure 1. Before a label is affixed, the keytop should be washed with soap and water and allowed to dry thoroughly. The individual keytop labels should be picked off the label form with a sharp-pointed knife (or a similar device) and positioned on the keytop. The label should then be pressed down with a fingertip.

Entry Assist users desiring more permanent keyboard installations on 3278 and 3279 display units only can purchase Accessory Kit PN 1742774, which contains eight sets of five replacement keytops engraved for use with Entry Assist, a keytop extractor tool, and Keytop Replacement Instructions (GA23-0120).

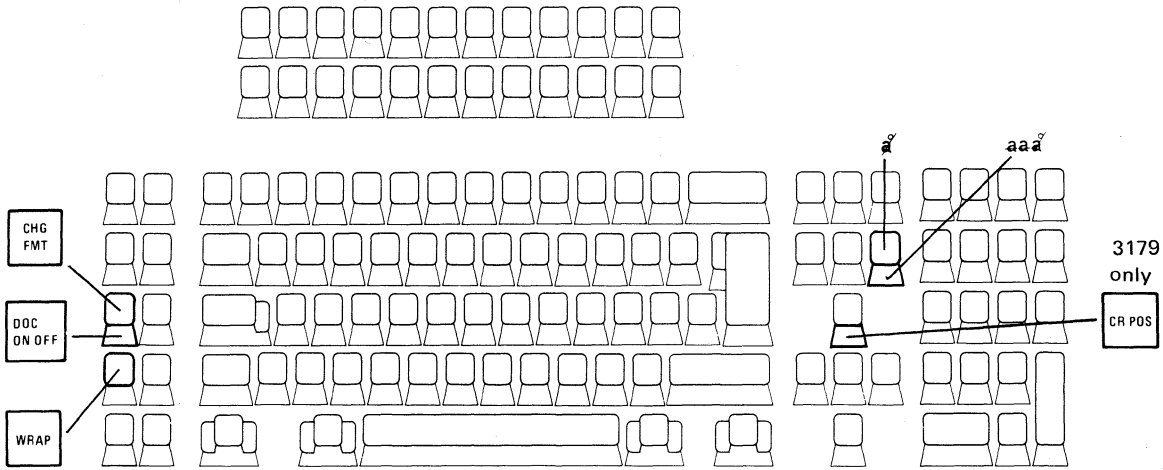



**Notes:**

1. Boxed items, for example, DOC ON OFF, are stick-on labels.
2. Keytops and faces outlined in bold lines indicate where stick-on labels are to be affixed.
3. RPQ 8K1038 keyboard. The CHG FMT function moves to the key indicated. The other Entry Assist functions remain as shown.

**A. 3178, 3278, and 3279 Typewriter and APL Keyboards and RPQ 8K1038 Keyboard**

Figure 1 (Part 1 of 3). Entry Assist Keyboard Layouts

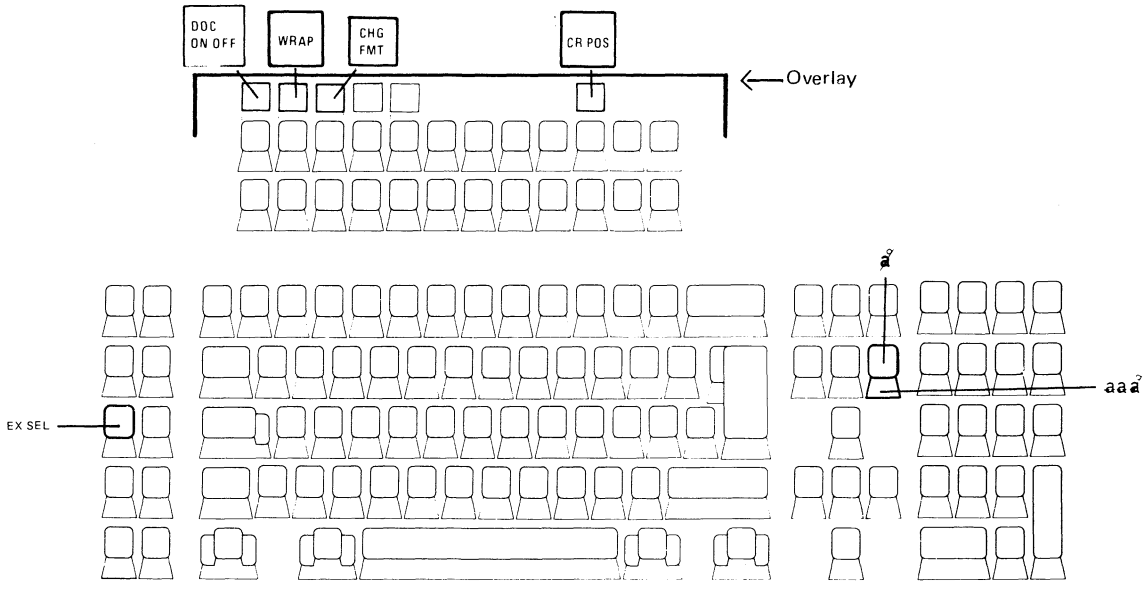



**Notes:**

1. Boxed items, for example, DOC ON OFF , are stick-on labels; unboxed items, for example, ~~aaa~~, are engraved on key.
2. Keytops and faces outlined in bold lines indicate where stick-on labels are to be affixed.

**B. 3179 and 3180 Typewriter Keyboards, Emulate Mode**

Figure 1 (Part 2 of 3). Entry Assist Keyboard Layouts




**Notes:**

1. Boxed items, for example, DOC ON OFF, are stick-on labels; unboxed items, for example, aaa, are engraved on key.
2. Keytops and faces outlined in bold lines indicate where stick-on labels are to be affixed.

**C. 3179 and 3180 Keyboards, Native Mode**

Figure 1 (Part 3 of 3). Entry Assist Keyboard Layouts

# Section 3. Entry Assist Capabilities

The DOC ON OFF key enables/disables all Entry Assist capabilities.[2] When a display unit is first powered on, the Entry Assist capabilities are disabled (off). Pressing the DOC ON OFF key (alt shift) enables the Entry Assist capabilities (the display is said to be in *document* mode) and causes the DOC symbol to be displayed in the operator information area (column positions 66–68). Pressing the DOC ON OFF key while in document mode disables the Entry Assist capabilities and clears the DOC symbol.

## 3.1 Formatting Controls

Keyboard controls to set and clear margins, tabs, and the audible 'end of line' signal are operational only when the display is in both document and change format modes. Pressing the Change Format (CHG FMT) key while in document mode places the display in change format mode. This action causes the scale line (see Figure 2) to appear in the operator information area (bottom row on the screen) with a scale line cursor indicating the current cursor position. (The normal cursor in the entry area is replaced with a reverse-image cursor.) The display user may now set, change, or clear the margins, tabs, or 'end of line' signal position, as described below, using the active keys indicated in Figure 3.

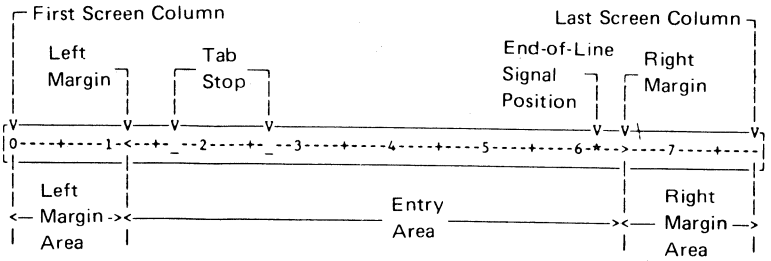



**Figure 2. Entry Assist Scale Line**

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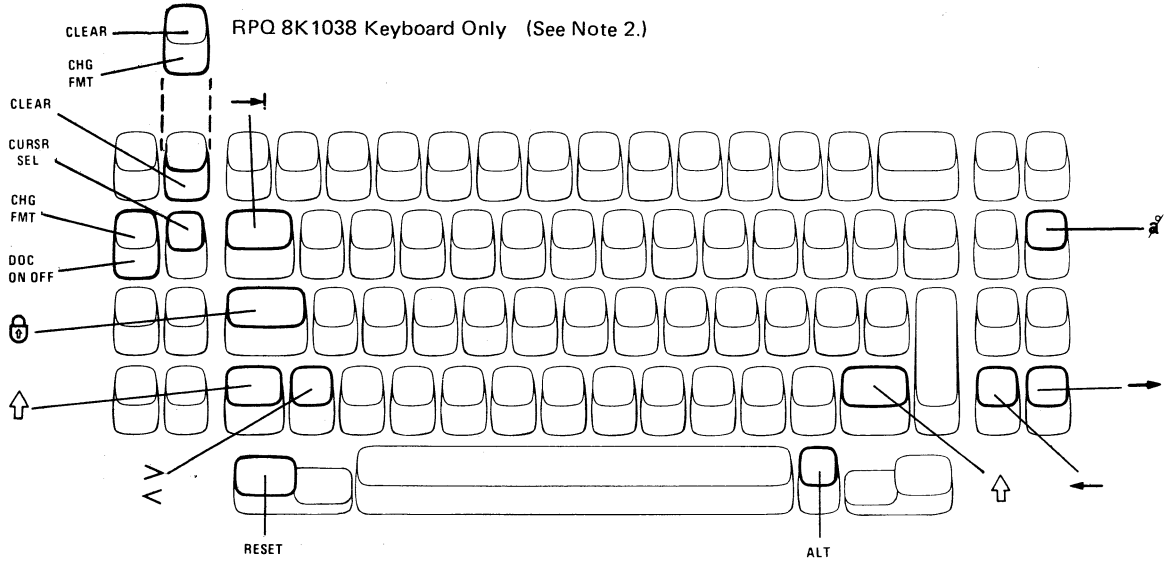
2 When you are working with 3179 and 3180 units in native mode, the unit must first be placed in extended-select mode.

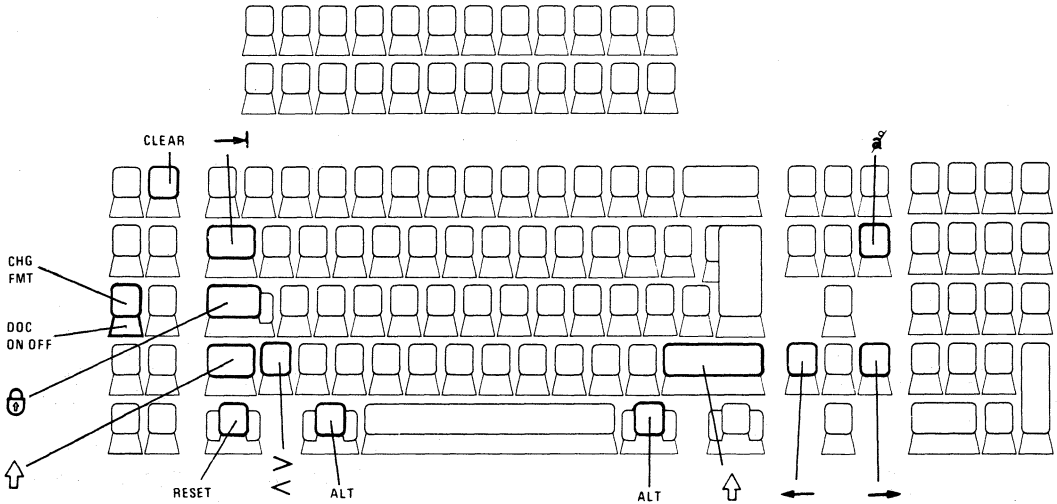



**Notes:**

1. Keytops and faces shown in bold outline are active; all others are ignored.
2. CLEAR becomes a keytop function, and CHG FMT a keyface function, only on the RPQ 8K1038 keyboard.

**A. 3178, 3278, and 3279 Keyboards and RPQ 8K1038 Keyboard**

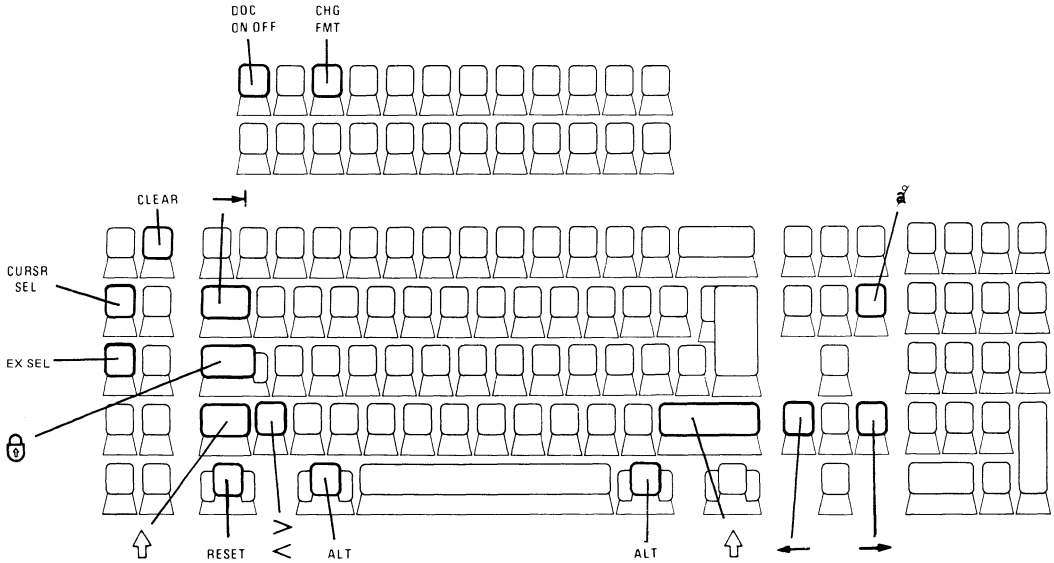
Figure 3 (Part 1 of 3). Change Format Active Keys




**Note:** Keytops and faces shown in bold outline are active; all others are ignored.

**B. 3179 and 3180 Keyboards, Emulate Mode**

Figure 3 (Part 2 of 3). Change Format Active Keys




**Note:** Keytops and faces shown in bold outline are active; all others are ignored.

**C. 3179 and 3180 Keyboards, Native Mode**

Figure 3 (Part 3 of 3). Change Format Active Keys

The scale line cursor is either a reverse-image cursor or an opaque box, depending on the type of display unit. When a valid key is typed, the scale line cursor disappears. This action provides immediate visual feedback on the character that was entered. Simply press the cursor left (<--) or cursor right (-->) key to again display the scale line cursor.

The normal cursor and the scale line cursor move in tandem in the horizontal direction. The normal cursor moves independently in the vertical direction. This provides a relationship of a position on the scale line with a position on the page being worked on.

Note that the Move Cursor to Next Word and Move Cursor to Previous Word keys can be used for rapid positioning of the cursor while in change format mode. (See headings 3.2.3 and 3.2.4.)

Pressing the Change Format key again resets this mode, erases the scale line, and returns the operator information area to its previous function. The cursor returns to the cursor display mode and to the screen position it occupied before change format mode was entered. The new margins, tabs, and audible 'end of line' signal are now operational and will remain in effect until they are changed or until the control unit is powered off.

## *3.1.1 Set Margins*

### 3.1.1.1 Standard Margin Type

To set margins, position the cursor (using the Cursor Left and Cursor Right keys) to the desired locations on the scale line and press the Less Than (<) key for the left margin and the Greater Than (>) key for the right margin. These actions define the area where data entry is to take place. The column defined as the left margin is included in the entry area. The column defined as the right margin is NOT included in the entry area.

Only one left and one right margin can be set for a given display. When the Less Than key is pressed, the previous left margin is replaced by the new one. Any tab stop or audible 'end of line' signal setting existing to the left of the new left margin is retained and remains operable. If a right margin existed to the left of or coincident with the new left margin, the right margin is reset to the default position (last scale line position). The scale line is updated accordingly.

When the Greater Than key is pressed, the previous right margin is replaced by the new one. Any tab stop or audible 'end of line' signal setting existing to the right of the new right margin is retained and remains operable. If a left margin existed to the right of or coincident with the new right margin, the left margin is reset to the default position (first scale line position).

If an attempt is made to enter a right margin in the left-margin default position, or vice versa, the input is ignored.

**Note:** When you are working at a 3180 Model 1 with extended function (scrolling, etc.), if the window width is less than the 80-column maximum width for Entry Assist, the window edges are indicated with left and right square brackets ([ ]).

### 3.1.1.2 Alternative Right Margin Type

The Greater Than symbol (>) establishes the standard right margin. (The standard right margin causes input to be inhibited when character entry is attempted at the right margin position in document mode with word wrap off.) You can establish an alternative right margin by positioning the cursor on the right margin symbol and pressing the Cursor Select key. The standard right margin symbol is replaced with a broken vertical bar ( ¦ ). This alternative right margin symbol signifies that an automatic margin release occurs at the right margin when word wrap is off; that is, the right margin is ignored when word wrap is off. This is useful in certain power typing situations. A second pressing of the Cursor Select key reestablishes the standard margin symbol and operation.

### *3.1.2 Set Tab Stop*

To set tab stops, position the cursor in the desired locations on the scale line and press the Forward Tab ( ⇥ ) key. The scale line is updated to show the new tab stop.

**Note:** A tab stop is indicated by the underscore symbol appearing in the scale line; however, the underscore symbol is not displayed if either a margin or the 'end of line' signal is also set at that location.

A maximum of 20 tab stops can be set. If an attempt is made to set more than 20 tabs, the input is ignored.

### *3.1.3 Set Audible End of Line Signal (Set Bell)*

To set the 'end of line' signal, position the cursor in the desired column position and press the asterisk (*) key. An asterisk symbol is displayed at that position.

The 'end of line' signal can be set at any position on the line, including margin and tab stop positions, causing the audible alarm to sound as the cursor enters that column position.

**Note:** The audible alarm feature is a prerequisite of this capability.

### *3.1.4 Clear Tab Stop and/or Audible End of Line Signal*

To clear a tab stop or the audible 'end of line' signal setting, position the cursor at the tab stop or at the 'end of line' signal setting and press the Delete Character key. If both a tab stop and the 'end of line' signal are set in the same position, both are cleared.

### *3.1.5 Clear All Tabs*

To clear all tab stops, press the CLEAR key. The scale line is updated accordingly.

### *3.1.6 Change Scale Line Origin*

To change the scale line origin, place the cursor at the first scale line position and press the Cursor Select key. The origin changes from 0 to 1, or vice versa. Margins, tabs, and 'end of line' signal position numbers are changed by 1 relative to scale line numbers, but there is no change in position relative to actual screen columns.

### *3.1.7 Permanence of Entry Assist Parameters*

The following Entry Assist parameters are preserved across entry to and exit from document mode until they are changed by the operator or until power is removed from the 3274 Control Unit:

- Margin settings and types
- Tab stop settings
- Audible line-ending signal position
- Word wrap status
- Scale line origin.

In addition, APL mode and insert mode states are preserved across entry to and exit from both document mode and change format mode.

## 3.2 Cursor Movement and Editing Keys

The following capabilities, which provide a great deal of flexibility during text entry/edit operation, are available in document mode.

### *3.2.1 Word Wrap*

Word wrap is a capability that automatically moves the last word on a row to the next row if the word would otherwise overrun the right margin, but only if the entire next row from the left margin to the right margin contains nulls or spaces.

Any length word less than the total space between the margins (exclusive of the margins) may be wrapped. Space characters are placed in the position formerly occupied by the wrapped word.

Word wrap is automatically turned on when document mode is established. A word wrap symbol ( ⇩ ) appears in column 70 of the operator information area when this capability is operational. Word wrap is turned on or off when the WRAP key is pressed.

Word wrap obeys margin boundaries. If any character, other than DUP or space, is entered into the column position immediately left of the right margin on the current row, then the entire word is placed on the next row, beginning at the left margin. If the word occupies that entire row, if the current row is the bottom row, or if the field in the next line is protected, then input is inhibited and the Too Much symbol ( ✖ 人> ) is displayed in the operator information area.

If the left margin is within an unprotected field on the screen, nulls to the left of the left margin within that field are changed to spaces. This is done to help ensure that the document will remain as the operator sees it on the screen after it is sent to the host in a read-modified operation.

A space character entered into the column position immediately left of the right margin position does not cause word wrap to occur, but causes the cursor to be positioned at the left margin of the next row.

If the cursor is in the column position immediately left of the right margin and the DUP key is pressed, the DUP character is placed in the right margin, and the DUP function is performed as defined when not in document mode.

**Note:** When word wrap is used with the 3180 Model 1 extended functions, the window is automatically scrolled when the last line in the window is filled.

### *3.2.2 Word Wrap Insert Mode*

When a display is in insert mode and word wrap is enabled, a word pushed out beyond the right margin because of inserted characters on that row will wrap onto the next row if that row contains enough spaces following the last word and/or enough nulls (within the margins) to accommodate the wrap.

If there is insufficient room for the wrap to occur, input is inhibited and the Too Much symbol ( ✖ 人 >) is displayed in the operator information area.

### *3.2.3 Typematic Move Cursor to Next Word*

When the Cursor Right key is pressed in ALT shift, the cursor moves to the first character of the next word or, if the cursor is within the last word on a line within margins, to the first null or blank after that word. The final cursor location must be in an unprotected field.

Margin limits are not observed. If a word is located outside the current margin settings, the cursor is positioned under it. If the cursor is outside the margins, it is positioned at the beginning of the next word within or outside the margins. If there are no more words on the existing row, the cursor is positioned at the beginning of the first word on the next row.

This capability wraps the cursor from the lower right to the upper left of the screen.

### *3.2.4 Typematic Move Cursor to Previous Word*

When the Cursor Left key is pressed in ALT shift, the cursor moves to the first character of the current word. If the cursor is at the first position of the current word, or if it is not positioned under a word, the cursor is positioned at the first location of the previous word.

If there are no more words on the existing row, the cursor is positioned at the last word on the previous row.

This capability wraps the cursor from the upper left to the lower right of the screen.

### *3.2.5 Delete Word*

Pressing the Delete Word key deletes the remainder of the word from and including the cursor position. The words following (to the end of the row or to the first attribute character) are shifted left to close the gap. This deletion includes the punctuation and the space or the null (if any) following the word. For a partial word delete,

the following null or space is not deleted. The cursor is left at its current location. Attributes and the characters to the right of them are not shifted. Subsequent rows are not shifted. If the cursor is located under a null or a space, the null or the space is deleted.

If the cursor is located under an attribute, or if the cursor is located in a protected field, input is inhibited and the Go Elsewhere ( ✖ ←☩→ ) symbol is displayed in the operator information area.

### *3.2.6 Typematic Delete Character*

The Typematic Delete Character key (Left and Right Brackets key in ALT shift for U.S. keyboards) causes a delete function identical with the current delete key except that this key is typematic.

### *3.2.7 Enhanced Cursor Tab*

When the Tab key is pressed, the cursor moves to the next unprotected tab stop, replacing unprotected null characters with space characters. If there are no intervening tab stops, the cursor moves to the next unprotected field; null characters are not changed to space characters in this operation.

This capability does not wrap the cursor from the lower right to the upper left of the screen.

**Note:** The Tab key operates differently when document mode is enabled and tab stops are set than when document mode is disabled. While in document mode with tab stops set, the Tab key introduces data (space characters) into the data stream sent to the host program. This insertion is necessary to preserve the tabular formatting that appears on the screen. Many programs are unable to handle this new data. Entry Assist is not intended for use with these programs. If no tab stops are set, the Tab key operates in the same manner, regardless of whether document mode is enabled or disabled, except that it does not wrap the screen.

### 3.2.8 Enhanced Cursor Backtab

Similarly to the *enhanced cursor* tab capability just described, *enhanced cursor backtab* moves the cursor to the previous tab stop or to the first unprotected character location of the current or previous field, whichever is closer. Nulls are not changed to spaces during the move.

This capability does not wrap the cursor from the upper left to the lower right of the screen.

### 3.2.9 Error-Correcting Backspace

While in insert mode, if the cursor is anywhere on the screen except at the Left Margin position, pressing the Backspace key deletes the character to the left of the cursor position, and the cursor is moved left one position. All characters to the right of the deleted character on the same row within the same field are shifted to close the gap, regardless of the right margin setting. Attributes and characters to the right of them are not affected.

If the cursor is at the left margin when the Backspace key is pressed, input is inhibited and the Input Inhibited and Go Elsewhere (  ) symbols are displayed (in the operator information area).

**Note:** When you are working at a 3180 Model 1 with extended function (scrolling, etc.), if a cursor is at the home position (upper left) of the window being displayed, the cursor backspaces out of the window. This capability does not wrap the cursor from the upper left to the lower right of the screen.

### 3.2.10 Enhanced New Line

The New Line key observes the left margin. The cursor is positioned at the left margin or, if the left margin is protected, at the first unprotected position to the right of the left margin within the entry areas. Unprotected null characters on the new line from the position to the left of the left margin and within the same field as the cursor are changed to spaces.

The cursor wraps the screen; that is, if the cursor is on the last row of the display, it is repositioned to the first unprotected location of the first row within the margins.

If the entire screen within the margins is protected, the cursor is positioned at the left margin of the first screen row.

### *3.2.11 Cursor Position Indicator*

When the Cursor Position (CR POS) key is pressed, the current position of the cursor is displayed in columns 75 through 80 of the operator information area as row and column (rr/cc) data. Row data has a value between 1 and 43, and column data a value between 1 and 80.

When the operator presses another key (or releases the ALT key) or uses any other input device, or the keyboard is locked because of a host transaction, the indicator is reset.

**Notes:**

1. The Cursor Position indicator key has no effect on 3180 units.

2. On 3180 units, the Cursor Position indicator disappears when change-format mode is entered and the scale line displayed.

# Section 4. Operational Considerations

Users should be aware that it takes only a keystroke to enter or exit document mode. Thus, users who can take advantage of Entry Assist some of the time but must avoid it at other times will find it easy to do so.

## 4.1 Selective Use of Entry Assist Capabilities

Users should be aware that the Entry Assist capabilities can be used selectively. Thus, many users who are not working with one of the host editors may still find it useful to operate with document mode on. For example, with default margins set at columns 1 and 80, with word wrap off, and with no tab stops set, operation is quite similar to non-document-mode operation; however, the following capabilities are still available:

- Move cursor by word
- Cursor position indicator
- Delete word
- Typematic delete character
- Line ending warning signal
- Backspace delete while in insert mode.

## 4.2 Entry Assist/Host Editor/Formatter Considerations and Limitations

When using a full-screen editor which uses a line command field, set the margin to prevent inadvertent entry of data into the line command field. If the line command field is to the left, set the left margin in the first entry position to the right of the command field. If the line command field is to the right, set the right margin just to the left of the command field. In general, the editors indicate the area where data entry is to occur.

Users of the Entry Assist function are cautioned that, when document mode is enabled and tab stops are set, the tab key causes space characters to replace null characters as the cursor moves to a tab stop. This action is required to preserve formatting information in the data stream. Tab stops should be set only in those situations where the host program can handle the space characters that will be generated.

### *4.2.1 SPF*

When using the SPF edit functions, set the left margin to correspond to the entry area. You can do this easily by positioning the cursor where typing is to begin and pressing the Change Format key. The scale line cursor is automatically in the same column position, and you can immediately set the left margin at this position. The right margin can generally be set in the rightmost column position. Thus, the SPF line command columns will be avoided during normal entry and edit of text material. The Backtab key or the previous word key can be used to position the cursor rapidly to the line command field.

Entry Assist is not intended for use with the SPF text entry mode; however, users of SPF may find it convenient to use document mode rather than the SPF text entry mode. Document mode with word wrap on allows "heads-down" entry of data while providing additional entry and editing conveniences. Also, with Entry Assist's word wrap facility, there is no need for host word adjustment; this can provide faster host response. If text entry mode is to be used, simply turn off document mode while in text entry mode; later, turn on document mode to edit a document entered in text entry mode.

### *4.2.2 ICCF*

When using ICCF, set the left margin at column 2. The ICCF editor positions the cursor to this column to begin with, and, when you press the Change Format key, the cursor appears on the scale line in the same column. Now you may set the left margin immediately.

Users are cautioned that, when in document mode, the Tab key causes space characters to be entered from the current cursor position to the next tab stop on the line. If tab stops are set and an operator uses the Tab key to move the cursor from the ICCF

command line to the input area, spaces may be placed in the command field. This would subsequently be interpreted by the ICCF editor as an illegal command. You can avert this situation by using the New Line key in this case, or by setting tab stops only when needed.

### *4.2.3 XEDIT*

The XEDIT entry area is clearly indicated on the screen. Position the cursor at the first entry column and press the Change Format key. The cursor appears on the scale line in the same column. You may now set the left margin immediately.

Entry Assist is not intended for use with the XEDIT power typing mode; however, users of XEDIT may find it convenient to use document mode rather than the XEDIT power typing mode. Since Entry Assist provides the same heads-down entry capability as power typing, and since it allows you to view the document in the same form it will subsequently be formatted in, and since Entry Assist's tabbing capabilities are superior to tabbing provided by Program Function keys, you may want to consider Entry Assist for original text input.

If you choose to use power input mode, you must turn off document mode while in power input mode; the two modes are incompatible. However, you can still use Entry Assist for subsequently editing the document. In that case, when you are editing the document, you should set the left margin to position 0 on the scale line and the right margin in the column just before the command field (assuming the command field is on the right side of the screen).

If you use Entry Assist for entering the original text using the INPUT command, then you may want to set the left margin at position 0 on the scale line and the right margin at position 73 or less. If you do this, the text portion of the edit screen will look exactly like the input screen.

### *4.2.4 EDGAR*

Users of EDGAR should generally set their left margin to column 1 if they are entering files for subsequent formatting by DCF so that DCF formatting commands will appear in expected positions. The right margin should be set just before the command field so that it will be avoided on input. The Tab key can be used to position the cursor to the command field.

### *4.2.5 DPPX*

When using Entry Assist with the DPPX editor:

- Do not use the Format subcommand; use the default format.
- Do not use the tab local-line function; use the Entry Assist tab function instead.

### *4.2.6 DCF*

The document composition facility (DCF) program operates on an input data set that contains both subject matter and formatting controls. A DCF run produces a document with the subject matter formatted as specified by the formatting controls. You can change the formatting controls in the data set without changing the subject matter, and another DCF run results in the same subject matter formatted according to the new format controls.

When you format a document using Entry Assist formatting controls, you cannot reformat it at a later time simply by changing an Entry Assist format control.

From the DCF viewpoint, Entry Assist can be seen as facilitating the creation and/or editing of the input data set, and, in addition, as providing limited formatting for margins and tabbing which supplements the extensive DCF facilities.

DCF requires that formatting commands appear in specific column locations. This requires that, when a DCF document is entered, the left margin for Entry Assist be set appropriately. For example, when using EDGAR, set the left margin in column 1. When using SPF, set the left margin in column 9.

For users who wish their final simple memos to appear in printed form as they do on the screen, the DCF line length should be set equal to the space between margins.

### *4.2.7 VMSG Facility (VM/370)*

When using VMSG, set the left margin at column 2. Since the VMSG editor sets the cursor at this point to begin with, you can simply press the Change Format key and set the left margin immediately.

## 4.3 Application Hints

### *4.3.1 Using Entry Assist to Create and Maintain Source Programs, JCL Lists, Etc.*

Entry Assist is very useful in creating and maintaining source programs. Source programs are typically maintained in fixed columnar format as noted below:

NAME OPERATION OPERANDS COMMENTS

By setting the left margin at the NAME column and setting tab stops at the OPERATION, OPERAND, and COMMENTS columns, you can rapidly enter source statements without giving further thought to column locations. If there is a possibility of the comments field's requiring continuation on another line, the 'end of line' signal may be set to provide a warning of a line ending.

To create program prolog sections or other areas of continuous comments, the following technique is useful:

- First, create a group of lines with the * character in the first and last positions of the line. (You can accomplish this speedily using the duplicate line command [" n] with XEDIT and with the Repeat Line Command [Rn] with the SPF editor.)

  The form created on your screen should look like this:

```
*                                   *
*                                   *
*                                   *
*                                   *
*                                   *
*                                   *
*                                   *
*                                   *
*                                   *
```

- Now set margins within the pair of * characters as illustrated below, where the Less Than character (<) represents a left margin and the Greater Than character (>) represents the right margin. (You will not actually see the < and > symbols except on the scale line when in Change Format mode.)

```
*<                                  >*
```

- Now, with word wrap on, you can enter comments into the lines thus created without giving further thought to margins or to new-line decisions.

### *4.3.2 Using Entry Assist with Other Programs*

Individual capabilities of Entry Assist are selectively usable with many other programs. For example, the Next Word and Previous Word capabilities, the Word Delete and Character Delete capabilities, and the Cursor Position Indicator capabilities are usable with many other programs. However, it will generally be necessary to ensure that no tab stops are set, since tabbing to a tab stop causes space characters to be introduced into the data stream.

### *4.3.3 Preparing Simple Memos without Using DCF*

The DCF program provides very powerful document-formatting capabilities. When DCF is not available, Entry Assist makes it possible to create formatted one-page memos. Basically, using an editor, the operator formats the screen as the operator envisions the memo should look, using blank lines for paragraph separators. Then, a utility program is used to print the file thus created. For example, under VM, the CMS PRINT command can be used to print the file. In other programming environments, other system utilities can be used. Multipage documents can be printed with user-written programs.

# Section 5. Entry Assist Tutorial

The following is a self-teaching tutorial for operators desiring to learn to use the facilities of Entry Assist. The text of the tutorial should be entered once per installation, with the normal editor text entry capabilities, and should then be made available at each operator station where Entry Assist is to be used. The text must be keyed so that, when an operator reads it at the screen, it appears exactly as it does in this printed copy. Where there are blank lines in the printed text, there should be blank lines in the screen copy, because the operator will want to work with those blank lines.

The text of the tutorial follows.

This is a short tutorial explaining how to use 3274 Entry Assist. Don't dwell long on the words here. The important thing is to follow the examples and try the new functions yourself.

In using this tutorial you will be modifying this file. Since you may want to use it again later, you should begin by making a copy of this tutorial and working with the copy.

Entry Assist provides a set of capabilities that make it easier to enter and edit textual material, that is, anything you enter using the editor program you are now using. Entry Assist has margins, tabs, and an audible 'end of line' signal; they act like the corresponding facilities on a typewriter. Entry Assist has a word wrap facility, which allows you to type without having to use the New Line key; that is, word wrap automatically does a new-line function for you when one is needed and it picks up any partially typed word and places it on the next line (provided the next line is empty). Also provided are facilities to delete a word, to delete individual characters typematically, to move the cursor to the next or previous word, and to display the row and column number of the current cursor position, and a backspace-delete facility when in insert mode. Let's discuss the facilities individually, and you can learn about them by using them.

You should verify that the Entry Assist function is available at your display. To do this, press and hold the ALT key while pressing the DOC ON OFF key. (If your display unit must be in the *extended*

*select* state [3179 and 3180 units in native mode], press the Ex Sel key before you press the DOC ON OFF key.) If Entry Assist is available, the characters DOC and a downward-pointing arrow ( ⇩ ) will appear near the right side of the operator information area (OIA). If Entry Assist is not available, do not proceed with this tutorial at this time. Five keys (six key surfaces) on your keyboard should be labeled for use with Entry Assist. If this labeling has not been done, do it now before you proceed.

If you have verified that Entry Assist is available at your terminal and the keyboard has been labeled, proceed with this tutorial.

Press the DOC ON OFF key several times. Note that it turns document mode on or off. When document mode is on, the characters DOC appear in the operator information area and the Entry Assist functions are available; when document mode is off, they are not available and your terminal operates exactly as it did before Entry Assist became available.

Let's try setting margins and also see how word wrap works. Do the following steps:

1. Turn on document mode. Note that, in addition to the DOC symbol appearing in the operator information area, a downward-pointing arrow appears. This is the word wrap symbol and means that word wrap is set on. This is explained below.

2. First position this line of text at the top of the display. (This is to avert a procedural problem later.) Now press the CHG FMT key. This puts the display into change format mode, wherein you can observe and change line formats. A scale line appears in the operator information area (instead of the normal symbols), and an additional cursor appears on the scale line. The scale line shows the current settings of the margins (< and > symbols), tab stops (_symbol), and the 'end of line' signal position (* symbol) if any. You now set margins and see their effect.

3. Move the cursor so that it lines up with the number 3 starting this sentence. Type the < symbol on the scale line. Note that the previous < symbol disappeared and only the one you typed remains on the scale line. This is the new left margin. The scale line cursor also disappeared, but will reappear when you press the Cursor Move key.

4. Move the cursor until it lines up with the last character on this line, and type the > symbol. This sets your right margin at that position.

5. Press the CHG FMT key again. This takes you out of change format mode. The scale line disappears, and the cursor returns to the position it was in when you entered change format mode. You now use the margins you just set.

6. Hold the New Line key down. Note how the cursor stays at the new left margin you just set as it goes down the screen.

7. Type a line of words in the space provided below, such as:

   anything anything anything anything

   Try to type a word into the right margin. You will observe that, as you type a character into the right margin, the partially typed word is moved to the following blank line. That is word wrap in operation. Try it now.

Did you see word wrap work? If not, go back to step 1 above and try again.

Experiment with word wrap some more in the space provided below to get a good feel for how it works. Note that word wrap requires a blank line following the line being typed on. If you try to wrap when the next line is not blank, the keyboard will lock. Try that too. (The RESET key clears keyboard lockups.)

You can turn word wrap on or off by pressing the WRAP key. If word wrap is on (downward-pointing arrow is visible), pressing the WRAP key turns it off. If it is off (no arrow), pressing the key turns it on. Try it a few times. When word wrap is off, if you type a character into the right margin, the keyboard will lock. Turn off word wrap and type a word into the right margin to see how the keyboard locks.

Turn word wrap on again now before proceeding.

Now, let's set some tab stops and the audible 'end of line' signal and see how they work. (**Note:** If you don't have an audible-alarm feature on your display, ignore the part that discusses the 'end of line' signal.)

1. First, press CHG FMT again to get back into change format mode. (The scale line appears.)

2. Press the CLEAR key. (This clears all existing tab stops.)

3. Referring to the line below with three Xs on it, move the cursor along the scale line until it lines up with the first X and press the Tab key (rightward-pointing arrow, the key above the shift lock key). The symbol __ appears on the scale line. This indicates that a tab stop is now set at this position on the line.

X X X

In like manner, set tab stops at the other two X positions. If you accidentally set a tab stop at an incorrect position, you can clear it by placing the cursor under it and pressing the Delete Character ( ⌫ ) key. We will use these tab stops in a minute.

1. Move the cursor along the scale line until it lines up about five positions to the left of the right margin and type the * symbol. This causes the 'end of line' signal to be set at that position of the line. We will use the signal in a minute. (You clear the 'end of line' signal by placing the cursor under it and pressing the Delete Character ( ⌫ ) key.)

2. Press the CHG FMT key to exit from change format mode. (The scale line disappears.)

Now we have margins, tab stops, and an 'end of line' signal set up. Let's try them.

Use the spacebar to move the cursor along the following blank line, and note that the 'end of line' signal sounds as the cursor passes through the signal position on the line.

Now return the cursor to the left margin and press the Tab key. Note how the cursor moves to the next tab stop (which you have just set). Press the Tab key a few times and note how the cursor moves from tab stop to tab stop. Hold the Tab key down and note that the cursor stops not only at tab stops but also at other positions on the line. These other positions are unprotected fields, and the cursor stops at them just as it always did when you used the Tab key.

Now try the Backtab key (leftward-pointing arrow just above the New Line key) and note that the cursor stops at the same positions as it moves in the reverse direction.

Use these keys to move the cursor around to get a feel for how they operate.

The following is an example of some columns of numbers that were entered using the Tab key to rapidly position the cursor to the column positions:

| | | |
|---|---|---|
| 0808 | 0808 | 97979 |
| 0808 | 8080 | 98088 |
| 0808 | 0808 | 80800 |
| 8008 | 9797 | 77575 |

Use the following blank area to enter some columns of numbers of your own choosing, using the Tab key to position the cursor to the column positions.

You should be aware of one important point about using the Tab key. When document mode is off, the Tab key merely moves the cursor to the next unprotected field. When document mode is on, the Tab key moves the cursor to the next unprotected field or to the next tab stop, whichever comes first. Also, if the move is to a tab stop, it also replaces null characters with space characters in the unprotected positions that the cursor passes over. This is necessary to preserve the spacing between the columns of data when the data is sent to the host. However, this introduction of space characters could be a problem for a program not expecting it. In that case, you can avert entry of space characters on tabbing operations by first clearing all tab stops.

Now let's try some other things:

First, let's do cursor movement by word:

Position the cursor at this line and then use the ALT shift of the Cursor Left key (double left arrow) to move the cursor to the previous word and the ALT shift of the Cursor Right key (double right arrow) to move the cursor to the next word. Also, try holding these keys down to note how they operate typematically. Experiment with these keys to get a feel for how they work.

Now let's see how the new delete capabilities operate.

First, *character delete* (typematic). (On some keyboards, the Character Delete key is not typematic. For these keyboards, Entry Assist has duplicated the character delete capability on another key [the ALT shift of the key labeled with braces, { }, on U.S. English keyboards] and has made it typematic.) To try the Character Delete key, position the cursor under the first character of the following sample sentence, and hold down the typematic delete key to delete multiple characters:

Sample Sentence: This is a sample sentence.

The other delete capability is the *word delete*. It deletes from the current cursor position to the end of the word. Place the cursor under any character of the sample word below and use the Word Delete key (the one labeled ~~aaa~~) to see how it operates.

Sample Word: Supercalifragilisticexpialidocious

Note that the word delete capability deletes from the current cursor position to the end of the word and moves following words on the same line leftward to fill in the vacated positions. Type some more words in the space below and then delete them to get a feel for the word delete capability.

Next, let's try some things that work only when your display is in insert mode:

First, the *backspace delete while in insert mode* capability. This capability undoes what a character insertion does. To try it, use the Insert key (which you are already familiar with) to insert the word *last* into the following sample sentence just in front of the word *time*. After you have typed the word *last*, press the Backspace Delete key to undo the insertion. Each pressing of the key deletes the previous character and then backs the cursor up one position. (The Backspace Delete key has the leftward-pointing arrow—the top row of the keyboard just above the backtab key.) Remember, this function operates only while insert mode is set.

Sample Sentence: This is the time.

We also need to understand how word wrap works when insert mode is set. Turn on insert mode and make sure that word wrap is on. Then insert enough words into the first sample sentence below to force a word into the right margin and note how word wrap works in insert mode. The words will wrap out of the first line into the second line as long as there are sufficient trailing spaces or nulls on the second line to accommodate them. When the next line cannot accommodate the word, the keyboard will lock.

Sample Sentence: This is a sentence. This is a sample sentence.

Now let's try the *cursor position indicator* capability. Press the CURS POS key. The current position of the cursor is displayed in the bottom row of the display in the form rr/cc, where rr gives the number of the row and cc gives the number of the column. Try it. The rr/cc value remains displayed as long as you hold the ALT shift key depressed.

Finally, you should be aware that line formats (margins, tab settings, and an 'end of line' signal setting) are remembered as long as power remains up at the 3274 Control Unit. You can verify this by turning document mode off and then back on again. There will be no change to your line formats. This is useful because, at times, it may be necessary to exit document mode momentarily.

# Appendix A. Eligible Display Units

The following display units can be used with the 3274 Entry Assist function:

- IBM 3178 Display Station Model 2C
- IBM 3278 Display Station Models 2, 3, and 4, and Model 5 in Model 2 mode
- IBM 3279 Color Display Station Models 2A, 2B, 2X, 3A, 3B, 3X, S2A, S2B, and S3G
- IBM 3179 Color Display Station (*emulate* and *native* modes)
- IBM 3180 Display Station Model 1 (*emulate* and *native* modes)

# List of Abbreviations

**APL.** A Programming Language.
**CICS/VS.** Customer Information Control System/Virtual Storage.
**COBOL.** Common Business-Oriented Language.
**DCF.** Document Composition Facility.
**DOS/VS.** Disk Operating System/Virtual Storage.
**DOS/VSE.** Disk Operating System/Virtual Storage Extended.
**DPPX.** Distributed Processing Programming Executive.
**EDGAR.** Display Editing System for CMS Program Number 5796-PJP.
**FORTRAN.** Formula Translation.
**ICCF.** Interactive Communications Control Facility.
**IMS/VS.** Information Management System/Virtual Storage.
**IPDT.** Integrated Processing of Data and Text Program.
**ISPF/PDF.** Interactive System Productivity Facility/Program Development Facility.
**IUP.** Interactive User Program.
**JCL.** Job Control Language.
**K.** The quantity 1024.
**OS/VS.** Operating System/Virtual Storage.
**PROFS PRPQ Editor.** Professional Office System Program Request for Price Quotation Editor.
**SPF.** System Productivity Facility.
**TSO.** Time-Sharing Option.
**VM/SP.** Virtual Machine/System Product.
**VM/370.** Virtual Machine/370.
**XEDIT.** System Product Editor.

ENTRY ASSIST USER'S GUIDE IBM 3274 CONTROL UNIT PRINTED IN U.S.A. GA23-0119-1.

GA23-0119-1

**3270 Information Display System**
**Entry Assist User's Guide**
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