

GA27-2837-3

File No. S360/S370/S3/4300/8100-09

**Systems**

**IBM 3270  
Information Display System  
Character Set Reference**



## Preface

This manual is a compendium for all the alphanumeric language keyboards and input/output (I/O) interface codes that are available with the 3270 Information Display System both in the United States and in World Trade (WT) countries. It provides management personnel, programmers, and systems analysts with general reference material relating to the 3270 Information Display System keyboards, and I/O interface codes that support various languages.

The 3270 Information Display System comprises the following units:

IBM 3271 Control Unit Models 1, 2, 11, and 12

IBM 3272 Control Unit Models 1 and 2

IBM 3274 Control Unit Models 1A, 1B, 1C, 1D, and 51C

IBM 3275 Display Station Models 1, 2, 11, and 12

IBM 3276 Control Unit Display Station Models 1, 2, 3, 4, 11, 12, 13, and 14

IBM 3277 Display Station Models 1 and 2

IBM 3278 Display Station Models 1, 2, 3, 4, and 5

IBM 3279 Color Display Station Models 2A, 2B, 3A, and 3B

IBM 3284 Printer Models 1, 2, and 3

IBM 3286 Printer Models 1 and 2

IBM 3287 Printer Models 1, 2, 1C, and 2C

IBM 3288 Line Printer Model 2

IBM 3289 Line Printer Models 1 and 2

## Fourth Edition (December, 1979)

This is a major revision of, and obsoletes, GA27-2837-2 and Technical Newsletter GN31-0985. Major technical changes have been made throughout, and this publication should be reviewed in its entirety. Significant changes or additions to the specifications contained in this publication will be reported in subsequent revisions or Technical Newsletters. Before using this publication in connection with the installation and operation of IBM equipment, refer to the *IBM System/360 Bibliography*, GC20-0360, and *IBM System/370 and 4300 Processors Bibliography*, GC20-0001, for editions that are applicable and current.

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## Chapter 1. Introduction

This manual describes the various alphanumeric languages for the 3270 Information Display System (IDS). The IDS units supported are as follows:

- 3271 Control Unit Models 1, 2, 11, and 12
- 3272 Control Unit Models 1 and 2
- 3274 Control Unit Models 1A, 1B, 1C, 1D, and 51C
- 3275 Display Station Models 1, 2, 11, and 12
- 3276 Control Unit Display Station Models 1, 2, 3, 4, 11, 12, 13, and 14
- 3277 Display Station Models 1 and 2
- 3278 Display Station Models 1, 2, 3, 4, and 5
- 3279 Color Display Station Models 2A, 2B, 3A, and 3B
- 3284 Printer Models 1, 2, and 3
- 3286 Printer Models 1 and 2
- 3287 Printer Models 1, 2, 1C, and 2C
- 3288 Line Printer Model 2
- 3289 Line Printer Models 1 and 2

In addition to these units, various I/O code formats are available that reflect the alphanumeric language requirements for the following countries:

- |                 |                        |
|-----------------|------------------------|
| Austria/Germany | Japan (English)        |
| Belgium         | Japan (Katakana)       |
| Brazil          | Portugal               |
| Canadian-French | Spain                  |
| Denmark/Norway  | Spanish-Speaking       |
| Finland/Sweden  | United Kingdom         |
| France          | United States (EBCDIC) |
| Italy           |                        |



## Chapter 2. 3275/3277 Display Station Alphanumeric Language Keyboards

### 3275 and 3277 Keyboards

Four types of keyboards are available for the 3275 Display Station: typewriter, data entry, data entry keypunch layout, and operator console keyboard (see Figure 2-1). All the keyboards have special symbol keys and control keys for entering data. The type of keyboard determines the characters and symbols that can be key-entered from the display station but does not determine which type of characters and symbols can be transmitted from the system for the display image. Variations between keyboards include 66-key and 78-key versions. The 66-key keyboard provides all the basic operator keys. The 78-key keyboard provides expanded operator-to-program message flexibility with 12 additional keys that may be defined to fit the requirements of the application program.

The six basic types of keyboards for the 3277, shown in Figures 2-1 and 2-2, are defined below. Refer to Chapter 3 for keyboard key layouts and nomenclature for World Trade countries.

**Typewriter Keyboard:** This keyboard provides the basic typewriter key layout. Alphanumeric keys are encoded with both lowercase and uppercase codes. The typewriter keyboard is available both with program function keys PF1 through PF12 (78-key version) and without them (66-key version).

**Data Entry Keyboard:** This keyboard provides the basic data-entry key layout. When characters are entered in a numeric field, the keyboard is automatically upshifted to take advantage of the grouped numeric keys (bold-outlined in Figure 2-1). The data entry keyboard contains 66 keys, including program function keys PF1 through PF5.

**Data Entry Keypunch Keyboard:** This keyboard has the same keys and features as the data entry keyboard. The key layout of this keyboard more closely resembles the layout of the 029 Card Punch and 129 Card Data Recorder. In many cases the layout is identical with the keypunch units except for the function key designations. This keyboard is recommended for data entry applications.

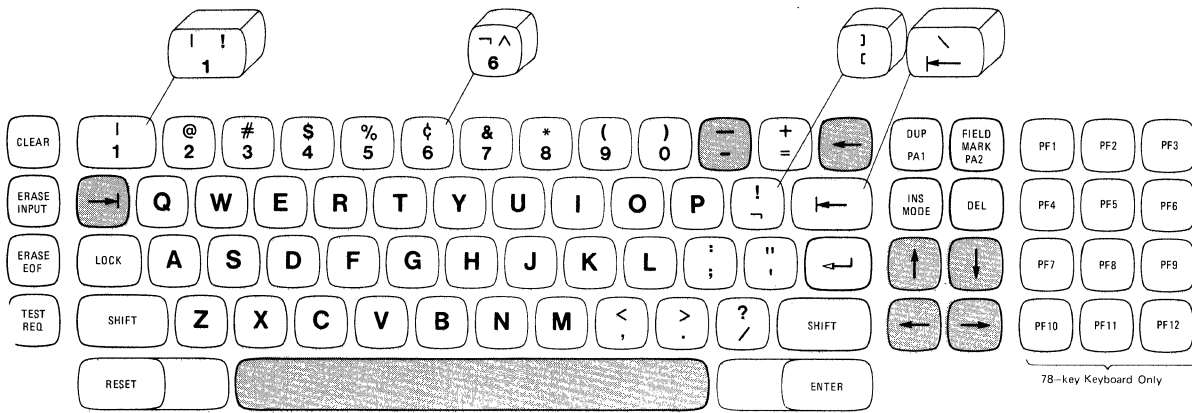
**Operator Console Keyboard:** This keyboard provides an IBM 1052 Model 7 key layout. It has 78 keys, including program function keys PF1 through PF12.

**APL Keyboard Feature (3277 Model 2 Only):** The 66-key (without program function keys) and 78-key versions of the APL keyboard permit the entry of 169 characters oriented to APL programming applications. In addition to the dual-case U.S. EBCDIC character set, this keyboard has the APL character set to permit the direct entry and display of underscored uppercase alphabetic and compound APL characters.

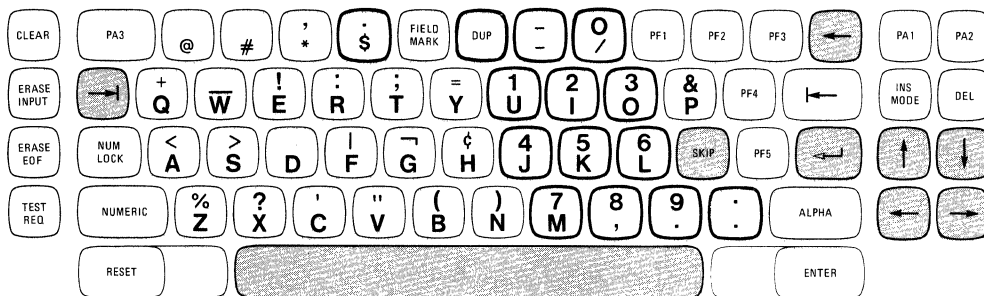
**Text Keyboard Feature (3277 Model 2 Only):** This 78-key keyboard is used in conjunction with the 3277 Model 2 Display Station to enable customers to enter and display a mono- or dual-case character set or a TN (Text) character set in text-processing operations. The keyboard is also capable of performing double-speed typamatic operations.

### 3275/3277 Keyboard Layouts

The keyboard types described and representing both the United States and World Trade countries are illustrated in Figures 2-3 through 2-13.



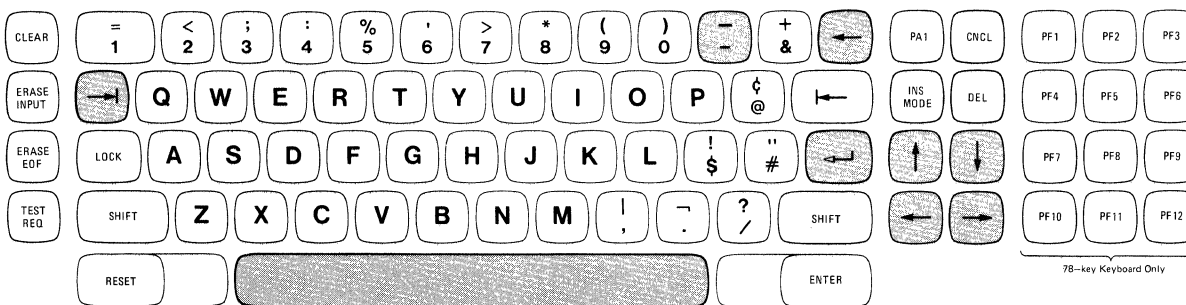
**Typewriter Keyboard (EBCDIC) – The ASCII typewriter keyboard, which accommodates both ASCII-A and ASCII-B character-set options, has four different keys, shown above keyboard.**



**Data Entry**

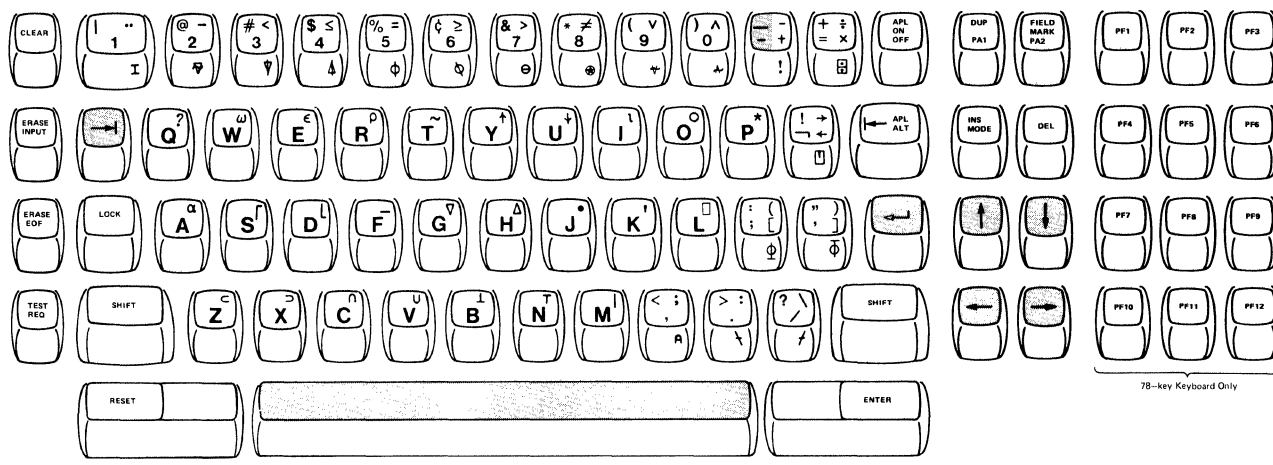


**Data Entry – Keypunch Layout**





**Operator Console**

**Figure 2-1. Basic Keyboards for 3275 and 3277 Display Station**

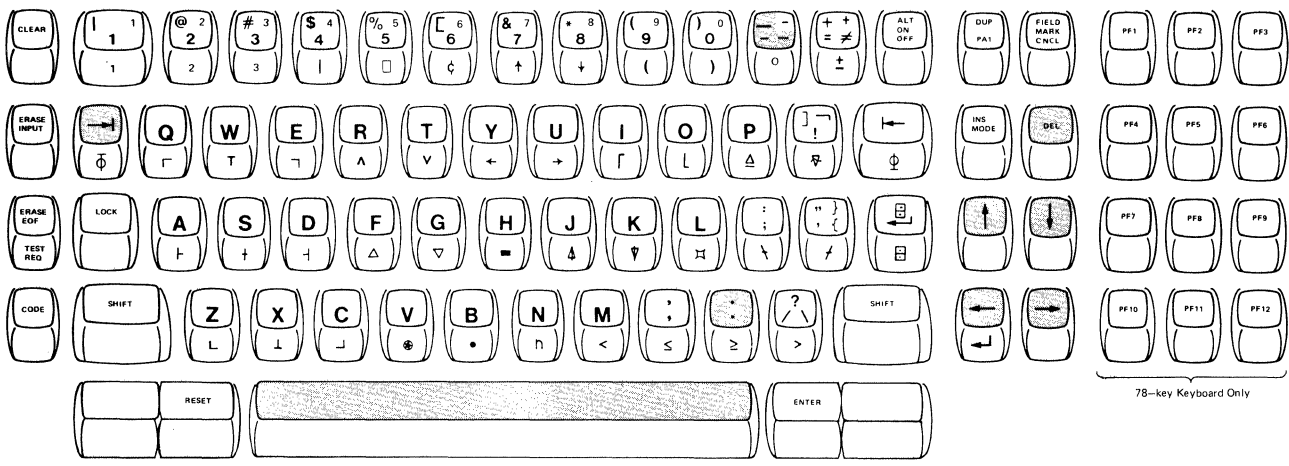


Legend:


 Typomatic Keys

 Typomatic Key (APL off)

**APL Keyboard**



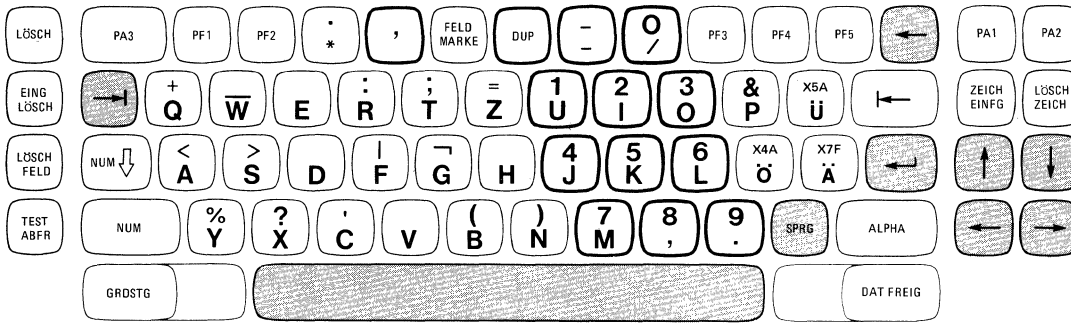
Legend:

 Typomatic Keys



**Text Keyboard**

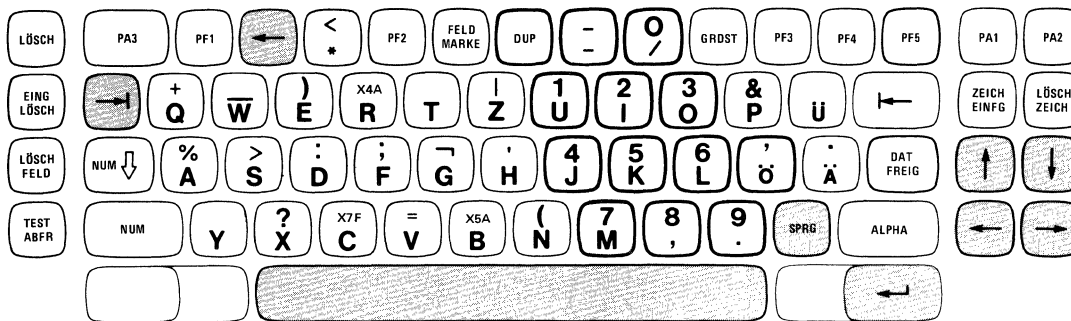
Figure 2-2. Special Feature Keyboards for 3277 Model 2 Display Station

 - Typematic Keys   
  - Numeric Keys



**Data Entry**

 Typematic Keys   
  Numeric Keys

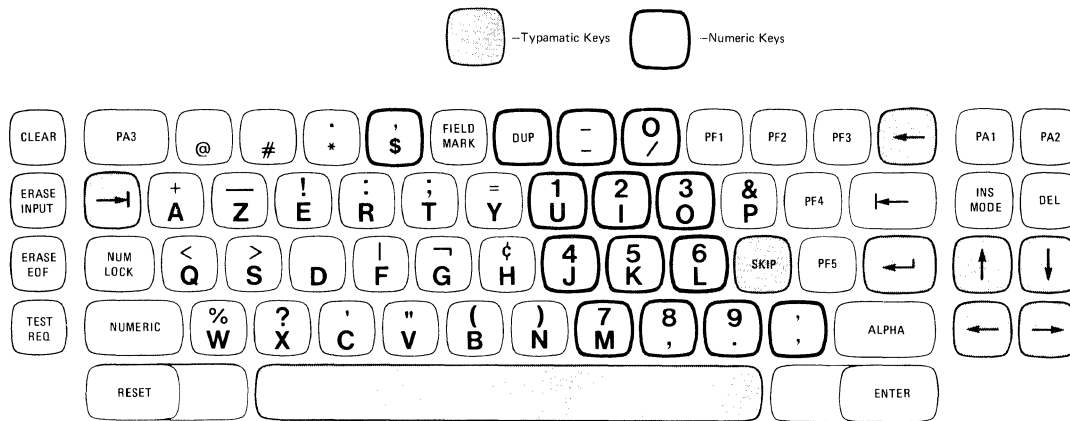


**Data Entry – Keypunch Layout**

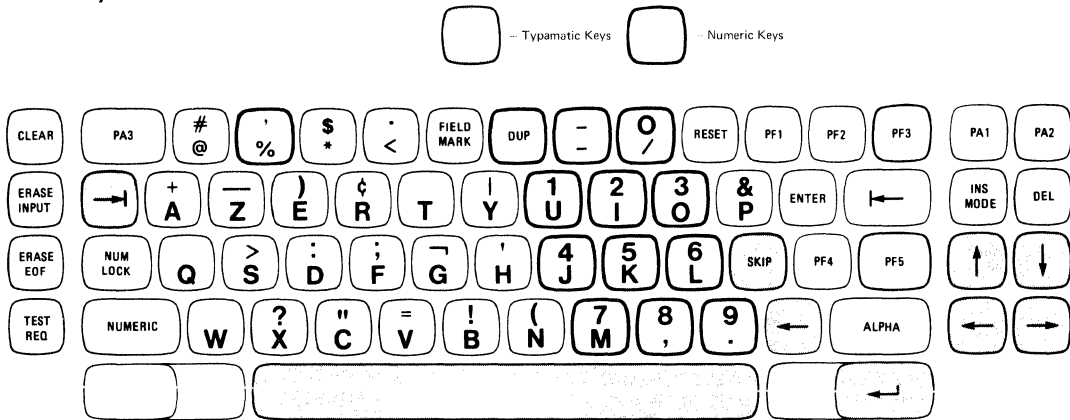


**Typewriter**

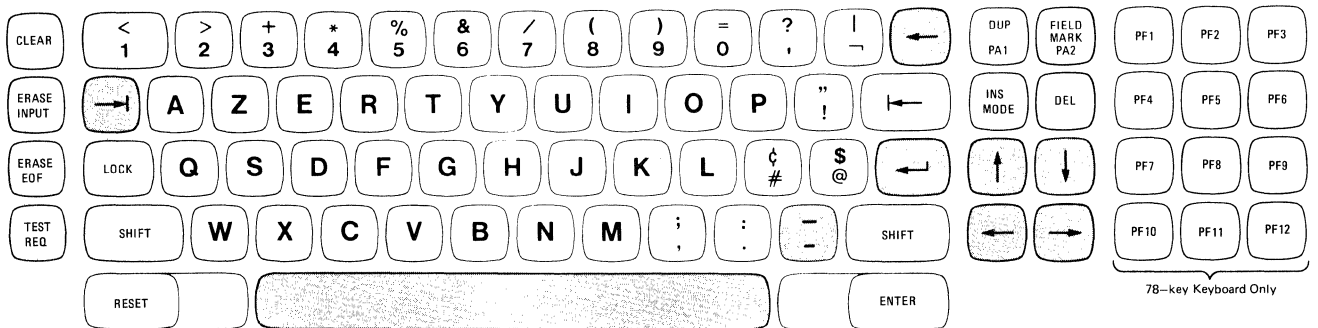
**Figure 2-3. Austrian/German Keyboards**



**Data Entry**



**Data Entry – Keypunch Layout**



**Typewriter**

*Note:* Belgium uses the same I/O interface codes and graphics used in United States EBCDIC. See Figure 4-14.

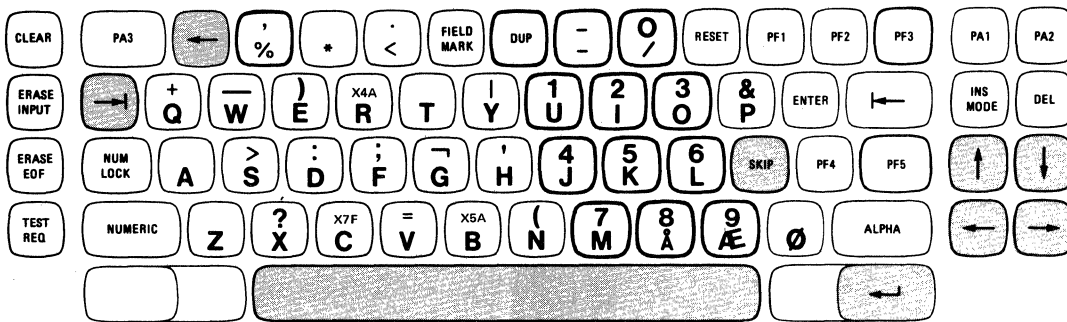
**Figure 2-4. Belgian Keyboards**

-Typmatic Keys
  -Numeric Keys

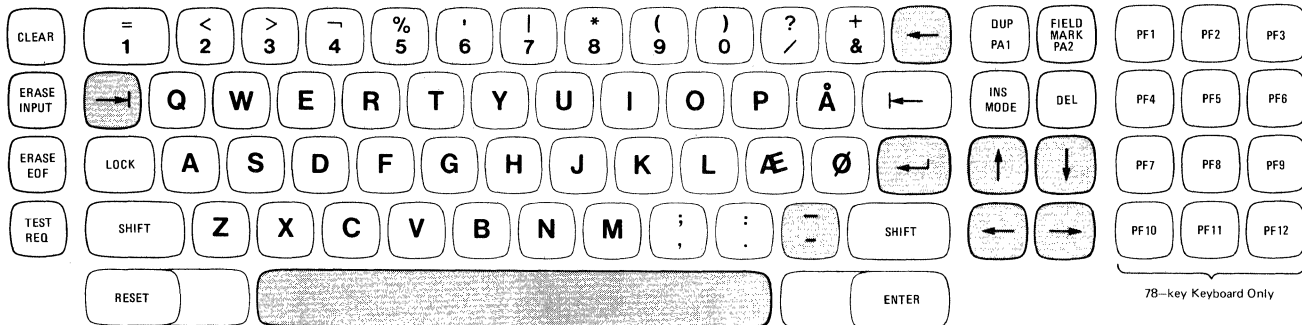


**Data Entry**

- Typmatic Keys
  - Numeric Keys



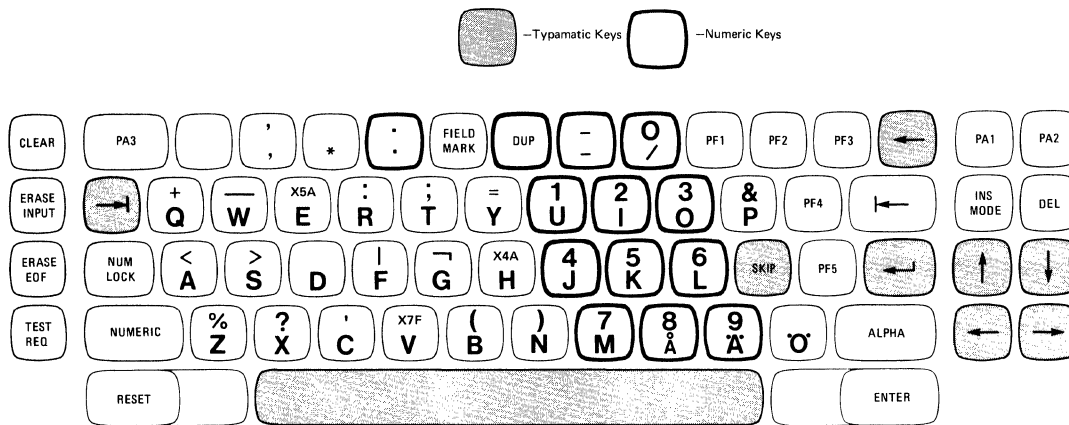
**Data Entry – Keypunch Layout**



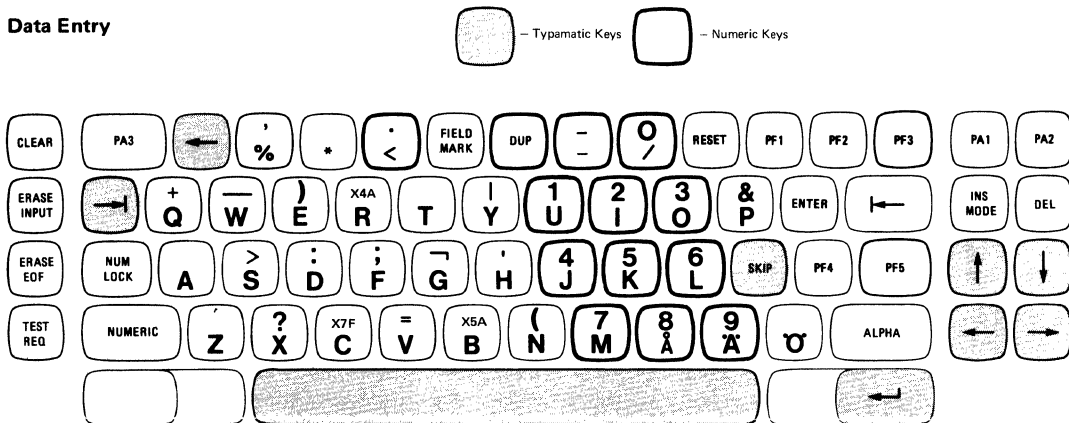
**Typewriter**

**Figure 2-5. Danish Keyboards**

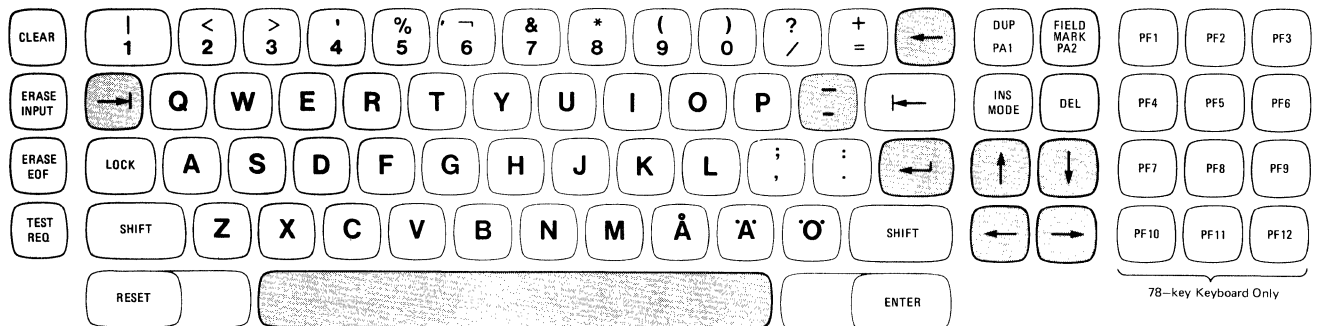




**Data Entry**





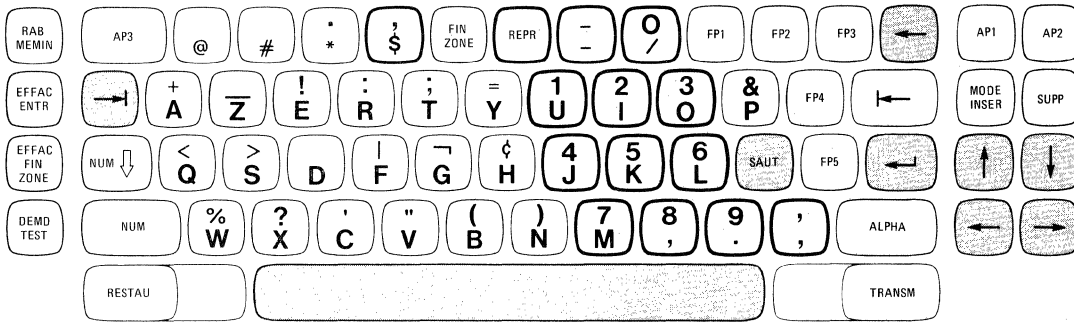
**Data Entry – Keypunch Layout**



**Typewriter**

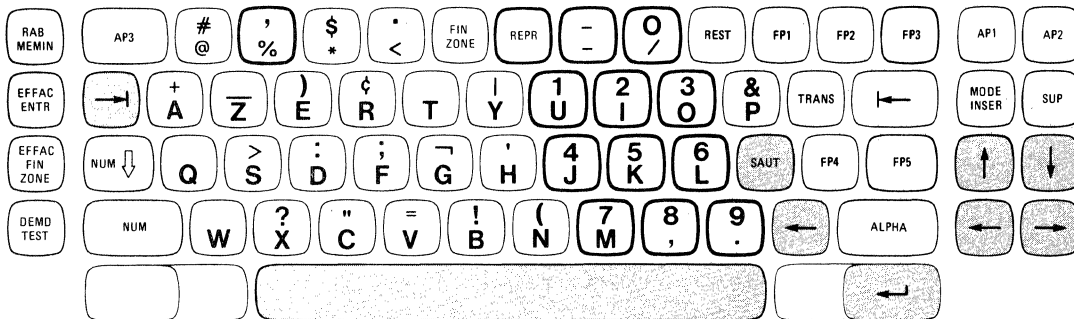
**Figure 2-6. Finnish/Swedish Keyboards**

 - Typamatic Keys   
  - Numeric Keys

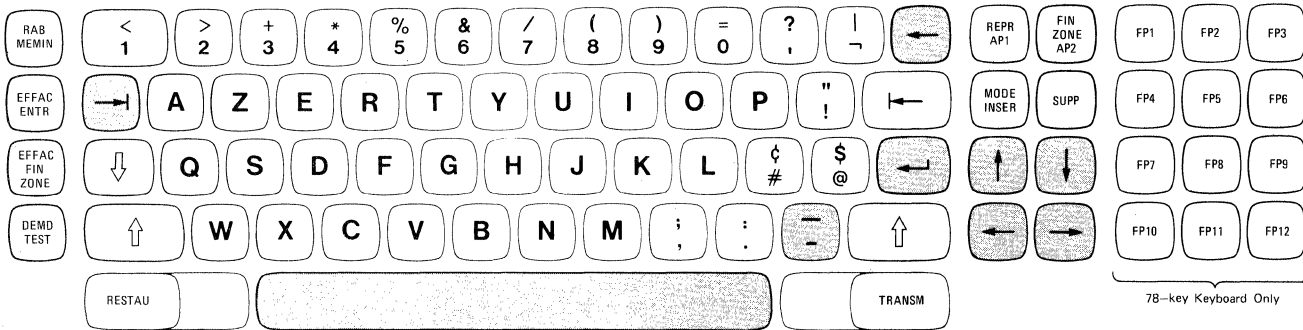


**Data Entry**

 - Typamatic Keys   
  - Numeric Keys



**Data Entry – Keypunch Layout**

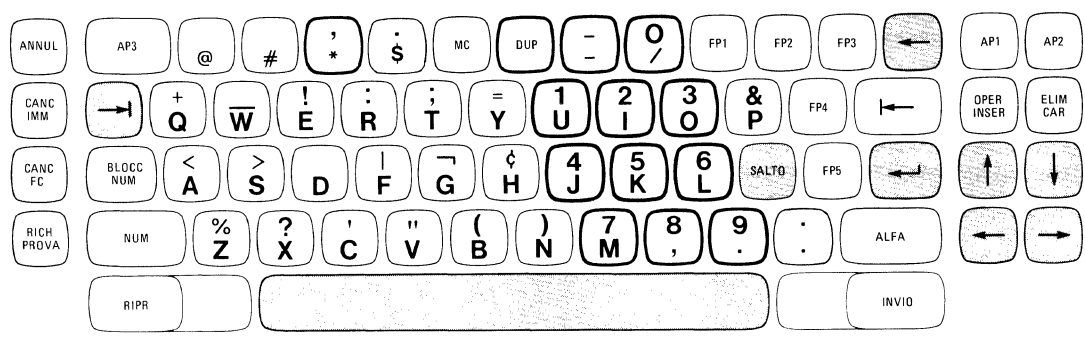


**Typewriter**

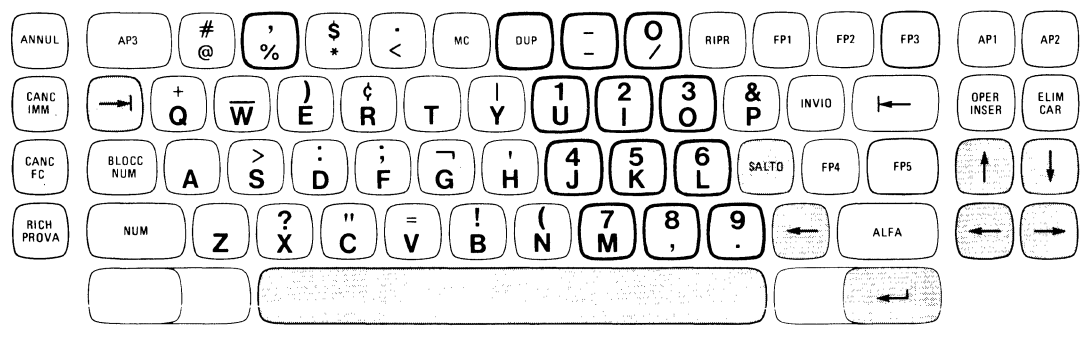
*Note:* France uses the same I/O interface codes and graphics used in United States EBCDIC. See Figure 4-14.

**Figure 2-7. French Keyboards**

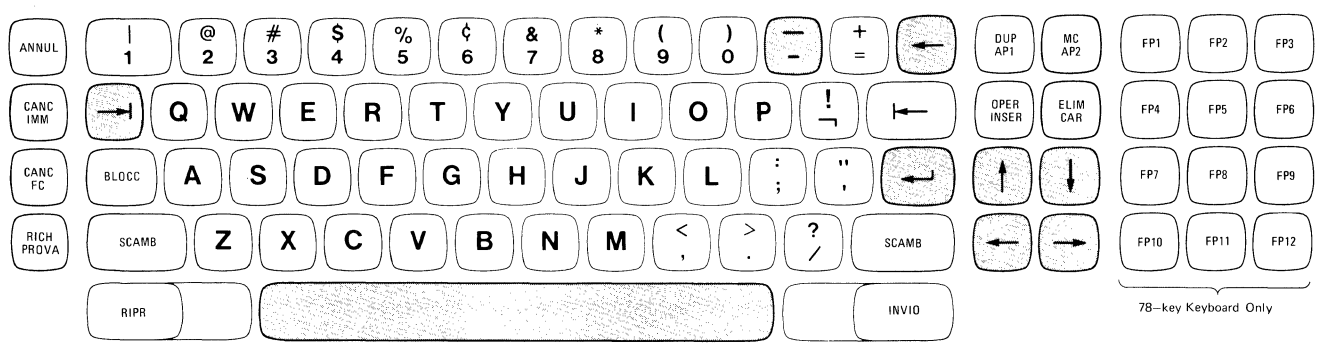
 - Typematic Keys
  - Numeric Keys



**Data Entry**
 - Typematic Keys
  - Numeric Keys



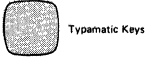
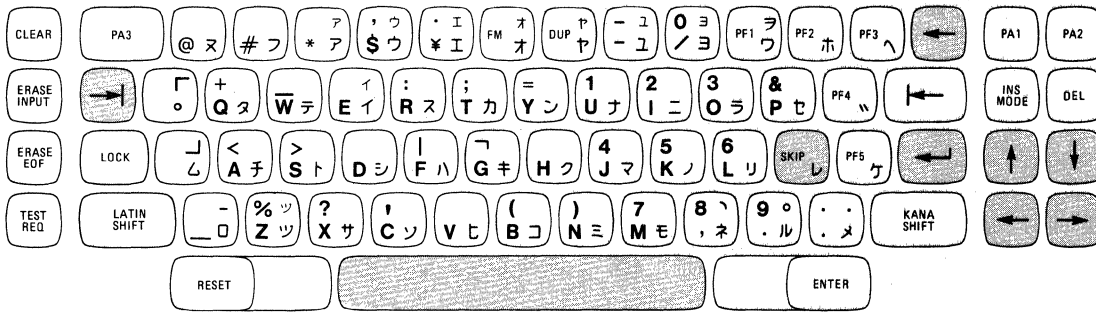
**Data Entry – Keypunch Layout**



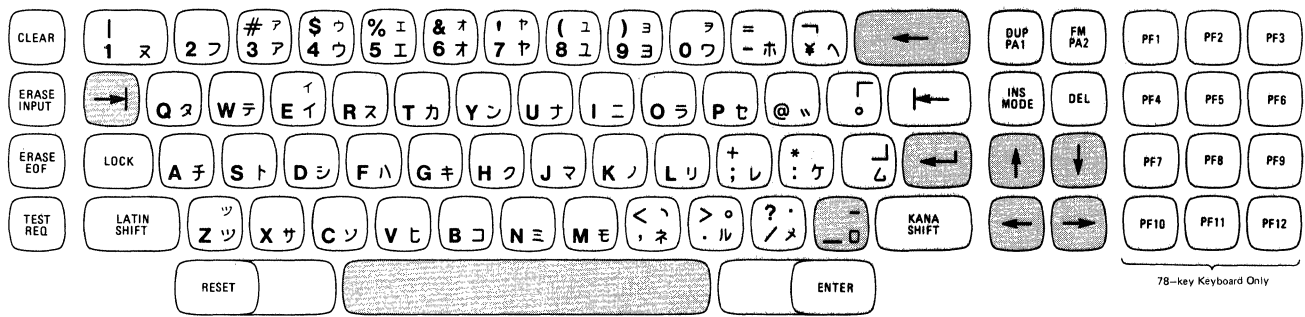
**Typewriter**

*Note:* Italy uses the same I/O interface codes and graphics used in United States EBCDIC. See Figure 4-14.

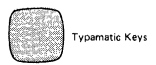
**Figure 2-8. Italian Keyboards**



**Data Entry**



78-key Keyboard Only



**Typewriter**


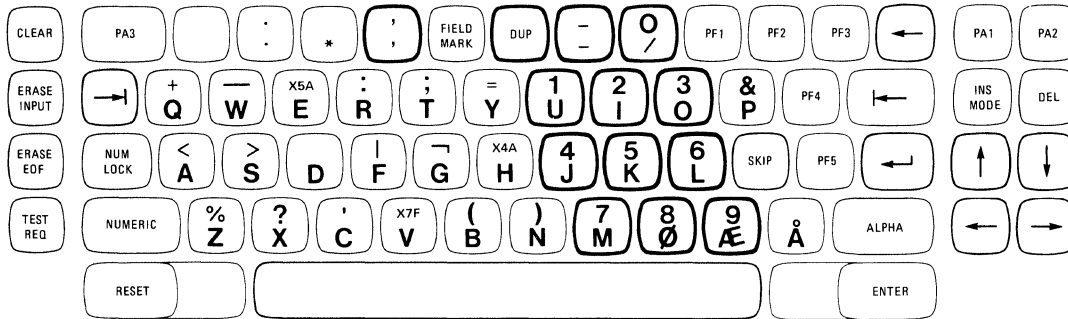
*Note:* Only ( \_ ) underscore character on  key is typamatic.

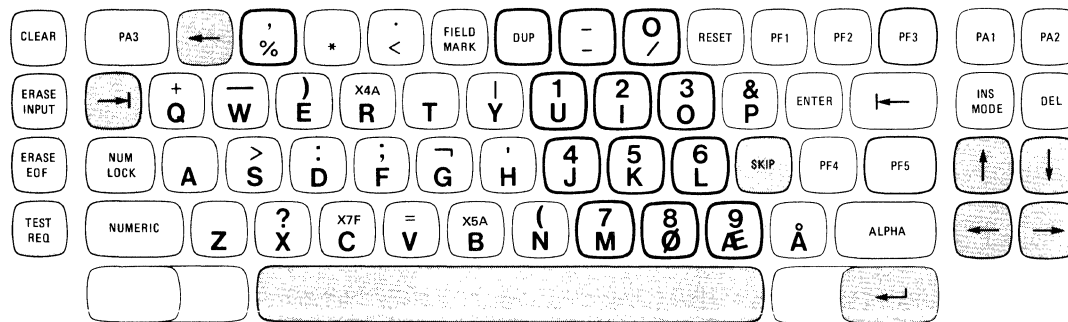
Figure 2-9. Japanese (Katakana) Keyboards

□ —Typmatic Keys □ —Numeric Keys

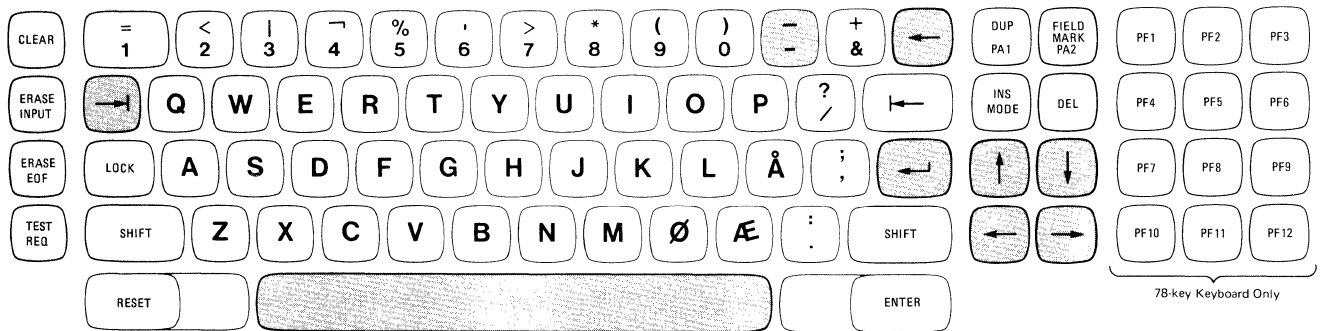


**Data Entry**

□ —Typmatic Keys □ —Numeric Keys





**Data Entry — Keypunch Layout**

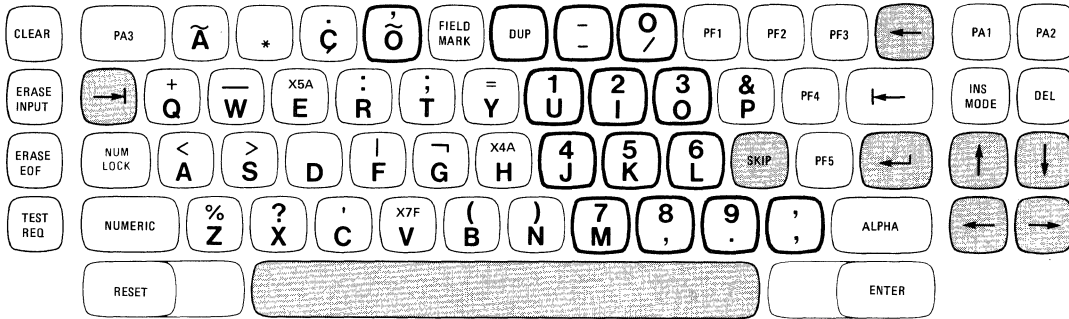


**Typewriter**

*Note:* Norway and Denmark use the same I/O interface codes and graphics.

**Figure 2-10. Norwegian Keyboards**

 -Typamatic Keys   
  -Numeric Keys

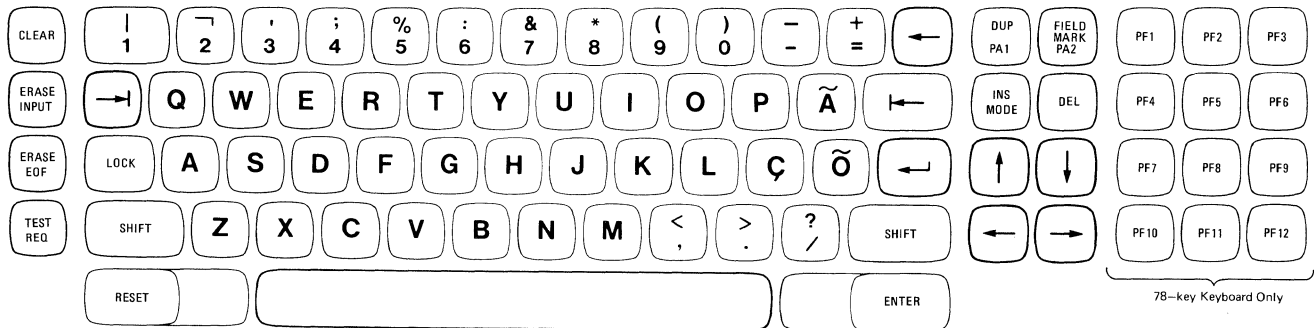


**Data Entry**

 - Typamatic Keys   
  - Numeric Keys

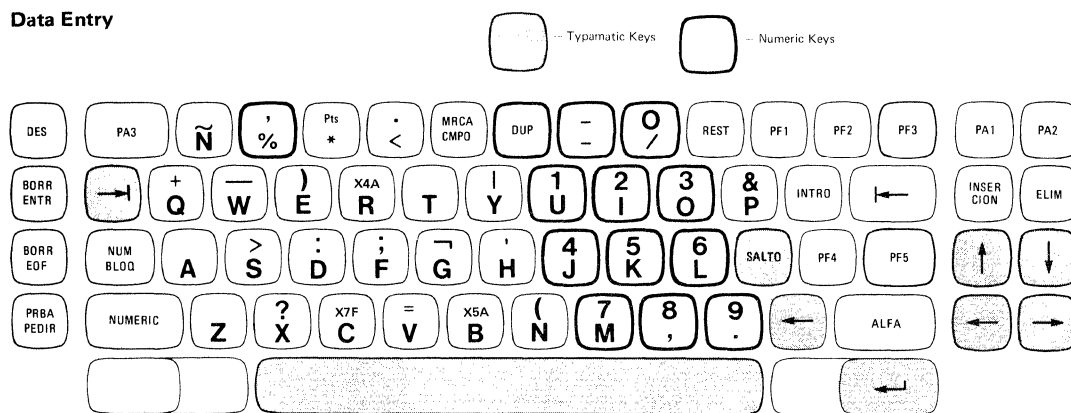
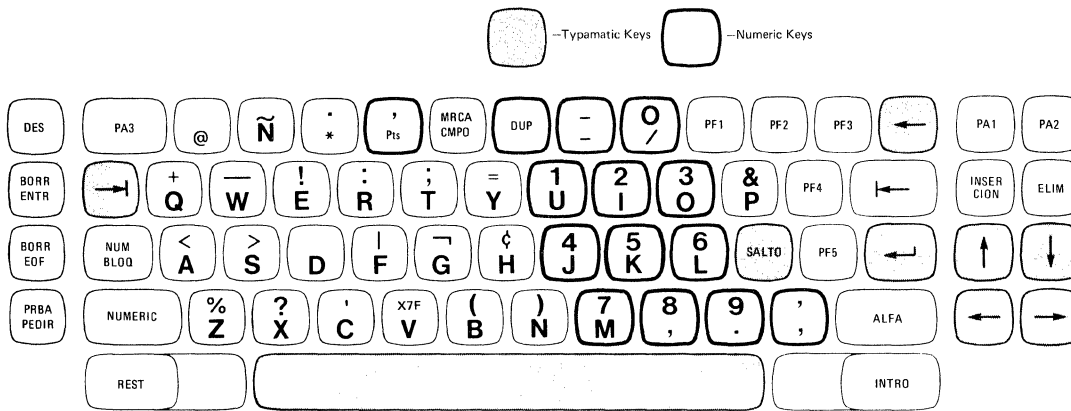


**Data Entry – Keypunch Layout**

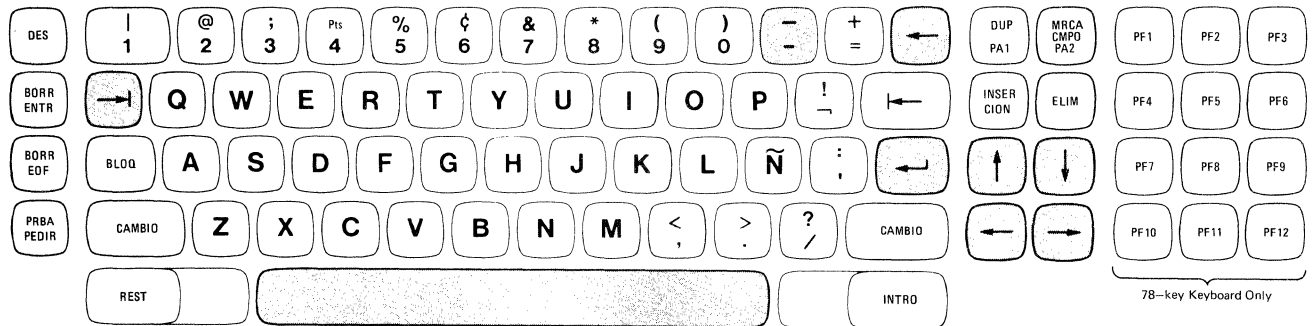


**Typewriter**

Figure 2-11. Portuguese Keyboards

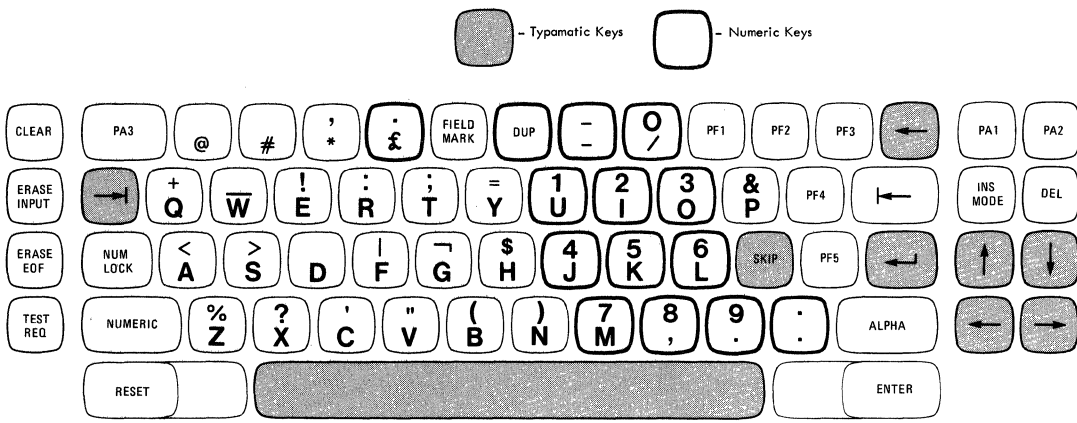


**Data Entry – Keypunch Layout**

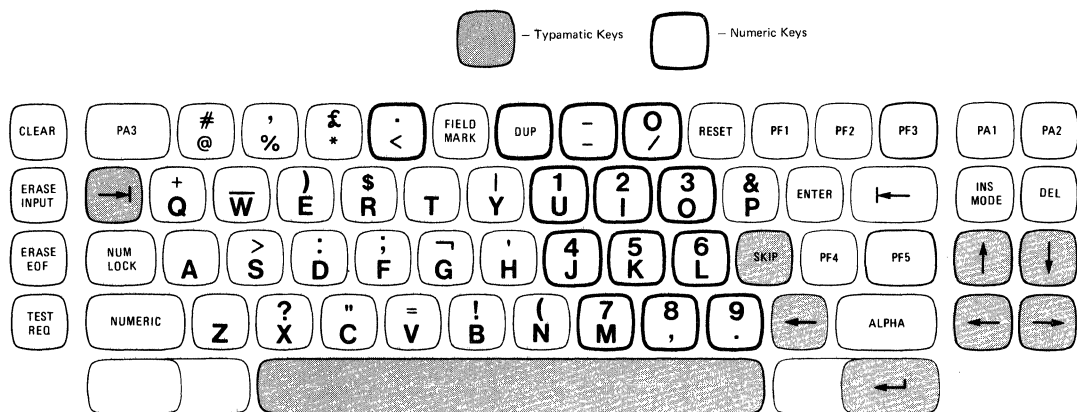


**Typewriter**

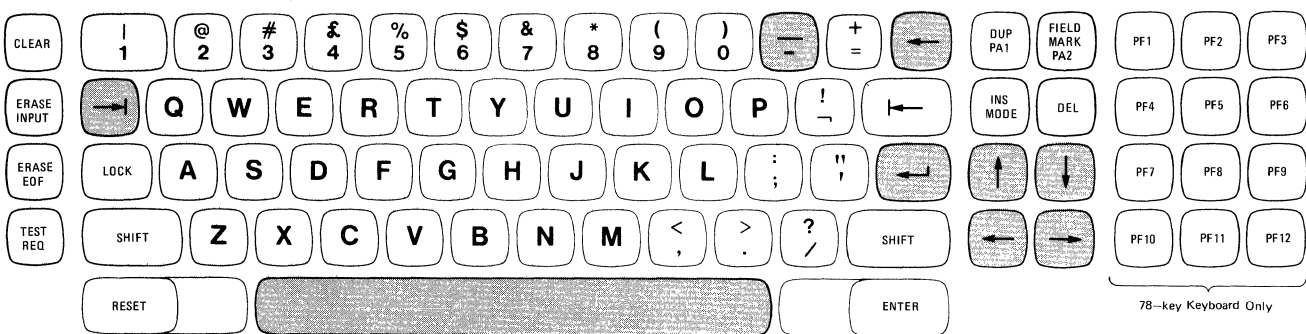
**Figure 2-12. Spanish Keyboards**



**Data Entry**



**Data Entry – Key Punch Layout**



**Typewriter**

**Figure 2-13. English (UK) Keyboards**



## Chapter 3. 3274/3276 - 3278/3279 Display Station Alphanumeric Language Keyboards

### 3274/3276 - 3278/3279 Keyboards

Displays with typewriter, data entry, or data entry keypunch keyboards may be mixed when used with the 3274 Control Unit or the 3276 Control Unit Display Station, provided that the keyboard languages are the same. One keyboard language cannot be interchanged with another keyboard language. Further, these keyboards can be attached to 3278/3279 units serving as terminals either to the 3274 or to the 3276 units.

Twelve of the keys on the top row of a 75-key or 76-key keyboard are standard program function keys PF1 through PF12 (APL keyboards do not have PF keys in the top row, see Note below). On 87-key and 88-key keyboards, an additional group of 12 PF keys is provided on the right-hand side of the keyboard. When an 87-key or 88-key keyboard is attached to a 3278 Model 2, 3, or 4, or to a 3279 Model 2B or 3B, the additional PF keys may have extended function. The added functions control the extended attributes: highlighting, programmed symbols, and, on the 3279, color.

**Note:** *On 87-key and 88-key APL and Text keyboards, the 12 PF keys to the right of the keyboard are numbered PF1 through PF12. Where these keys also control attribute selection, their function is the same as on other 87-key and 88-key keyboards.*

**75-Key Typewriter Keyboard:** This keyboard, shown in Figure 3-1, has 49 data keys and 26 control keys. Twelve program function (PF) keys are included in the keyboard. The Japanese (English) and Japanese (Katakana) typewriter keyboards each contain one additional control key, resulting in a 76-key keyboard. Refer to the typewriter keyboard figures for each national language.

**75-Key Data Entry Keyboard:** This keyboard, shown in Figure 3-1, has 35 data keys, 10 PF keys, and 30 control keys. This keyboard is available in a 75-key keyboard only [76 keys for Japanese Katakana (see Figure 3-2)]. Refer to the data entry keyboard figures for each national language.

**75-Key Data Entry Keypunch Keyboard:** This keyboard, shown in Figure 3-1, has 35 data keys, 10 PF keys, and 30 control keys. This keyboard has a *reset key* function in key-position 13 and an *enter key* function in key-position 32 to facilitate “one-hand” typing. Refer to the data entry keypunch keyboard figures for each national language.

**87-Key Typewriter Keyboard:** This keyboard, shown in Figure 3-3, has 49 data keys, 26 control keys, and 12 additional PF keys. The Japanese English and Japanese Katakana keyboards each contain one additional control key, resulting in an 88-key keyboard (see Figure 3-4). **Note:** *The extra 12 PF keys (PF13-PF24) have been purposely omitted from the national language keyboard figures in this chapter because of art-space limitations.*

**87-Key EBCDIC Typewriter/APL Keyboard:** This keyboard, shown in Figure 3-5, has modified keytops to allow entry of 81 APL specific characters in addition to the dual-case 94-character EBCDIC set. An APL ON/OFF key is used to place the keyboard in EBCDIC typewriter or APL mode. In contrast to the 87-key typewriter keyboard *without APL* (Figure 3-3), the program function keys (PF1 through PF12) have been relocated from the top-row keyfaces of the main keyboard to the right side of the main keyboard area.

**87-Key EBCDIC Typewriter/Text Keyboard:** This keyboard, shown in Figure 3-6, has modified keytops to allow entry of 65 Text specific characters in addition to the dual-case 94-character EBCDIC set. A Text ON/OFF key is used to place the keyboard in

either EBCDIC typewriter or Text mode. In contrast to the 87-key typewriter keyboard *without Text* (Figure 3-3), the program function keys (PF1 through PF12) have been relocated from the top-row keyfaces of the main keyboard to the right side of the main keyboard area.

**87-Key EBCDIC Typewriter Overlay Keyboard:** A typewriter layout keyboard similar to the 87-key EBCDIC Typewriter keyboard. The 48 character keys in the typewriter section of the keyboard have smaller keytops. Blank overlays are available for the user to markup special characters or symbols assigned to these keys when using programmed symbols (PS). Keytops of the 12 program function keys at the right of the keyboard are modified to show the attribute select functions. (See Figure 3-29.)

**87-Key EBCDIC Attribute Select Typewriter Keyboard:** A typewriter layout keyboard similar to the 87-key EBCDIC typewriter keyboard. Keytops of the 12 program function keys at the right of the keyboard are modified to show the attribute select functions. (See Figure 3-28.)

**87-Key EBCDIC Attribute Select Typewriter/APL Keyboard:** A typewriter layout keyboard similar to the 87-key EBCDIC typewriter/APL keyboard. Keytops of the 12 program function keys at the right of the keyboard are modified to show the attribute select functions. (See Figure 3-28.)

**88-Key Japanese (English) and Japanese (Katakana) Typewriter/APL Keyboards:** These keyboards, shown in Figure 3-7, have modified keytops to allow entry of 81 APL specific characters in addition to their respective national language character sets. An APL ON/OFF control key is used to place the keyboards from the national language modes to APL mode. In contrast to the 88-key national language typewriter keyboards (English/Katakana), shown in Figure 3-4, the program function keys (PF1 through PF12) have been relocated from the top-row keyfaces of the main keyboard to the right side of the main keyboard area.

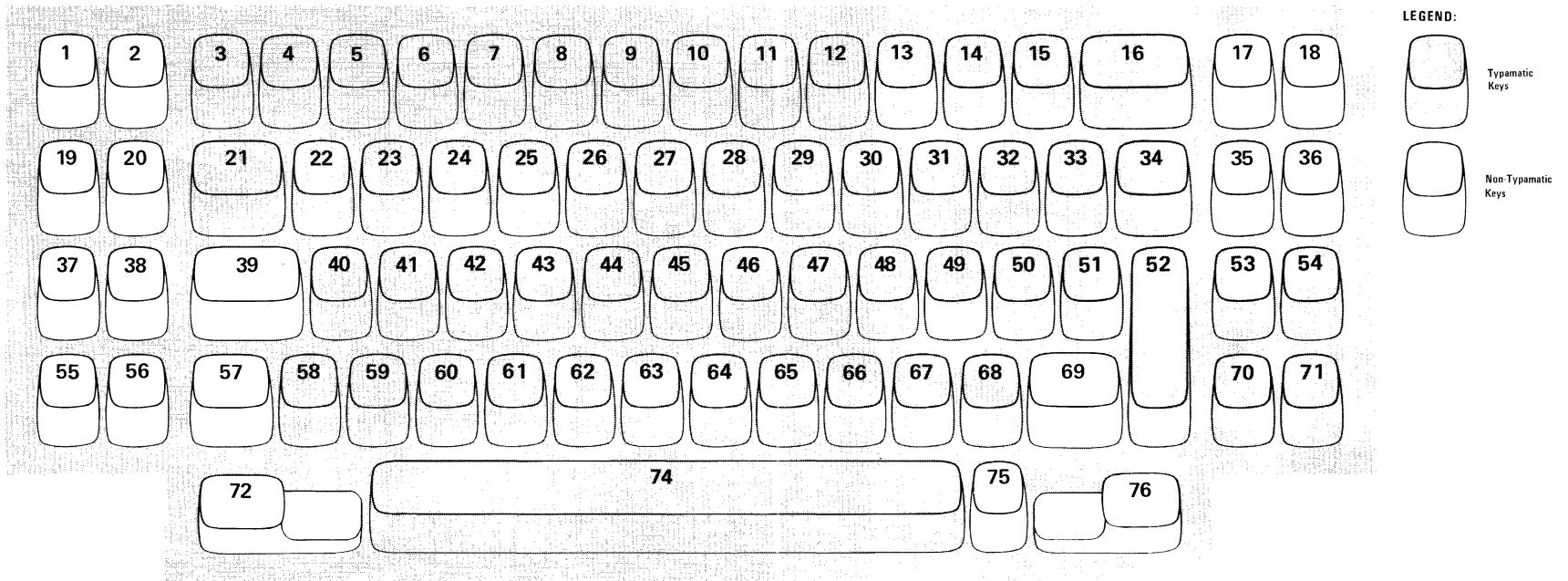
**88-Key Japanese English/Japanese Katakana Typewriter Overlay Keyboards:** Typewriter layout keyboards similar to the 88-key Japanese English/Japanese Katakana typewriter keyboards. The 48 character keys in the typewriter section of the keyboard have smaller keytops. Blank overlays are available for the user to markup special characters or symbols assigned to these keys when using programmed symbols (PS). Keytops of the 12 program function keys at the right of the keyboard are modified to show the attribute select functions. (See Figure 3-29.)

**88-Key Attribute Select Japanese English/Japanese Katakana Typewriter Keyboards:** Typewriter layout keyboards similar to the 88-key Japanese English/Japanese Katakana typewriter keyboards. Keytops of the 12 program function keys at the right of the keyboard are modified to show the attribute select functions. (See Figure 3-28.)

**88-Key Attribute Select Japanese English/Japanese Katakana Typewriter/APL Keyboards:** Typewriter layout keyboards similar to the 88-key Japanese English/Japanese Katakana typewriter/APL keyboards. Keytops of the 12 program function keys at the right of the keyboard have been modified to show the attribute select functions. (See Figure 3-28.)

## Keyboard Key Position Numbers

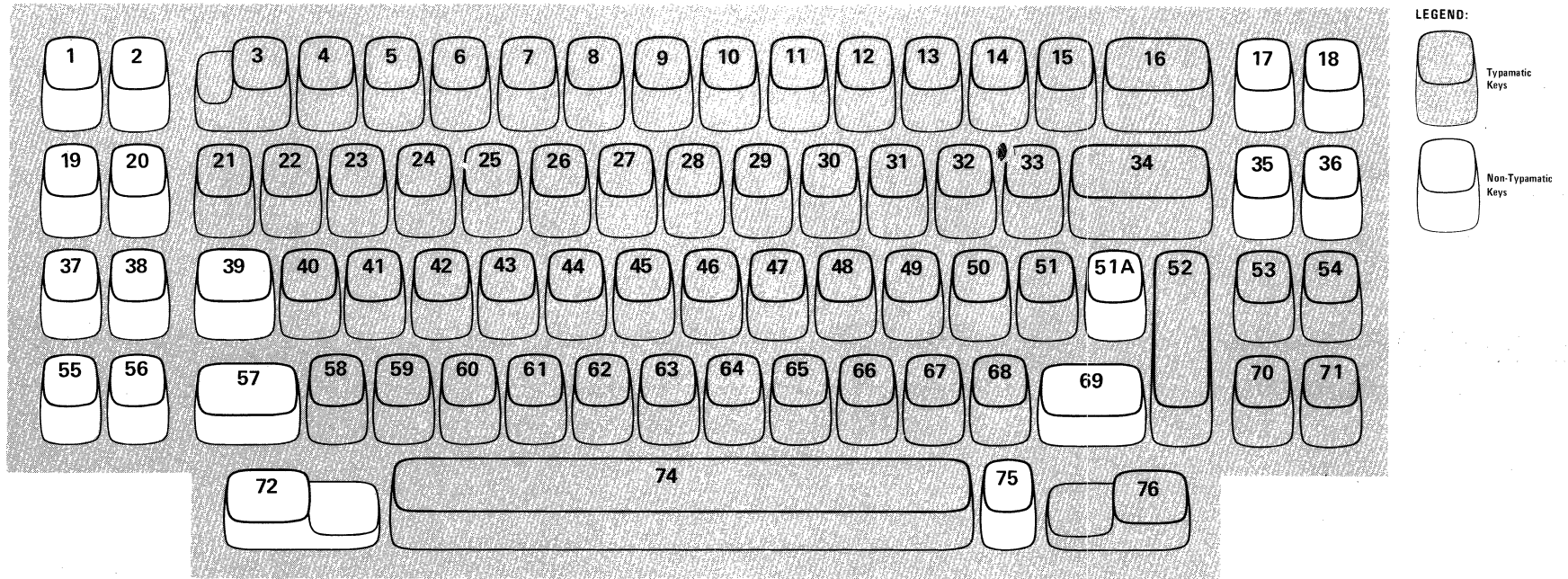
The 3274/3278/3279 and 3276/3278/3279 keyboard types for the various national languages and the keyboard key position number charts both for the United States and for World Trade countries are illustrated in Figures 3-1 through 3-29.



*Notes:*

1. Key number assignments apply to typewriter and data entry keyboards.
2. The key face and all character/symbols shown on the keyboard layouts in this chapter require that the alternate (ALT, key number 75) be held pressed first.
3. The nonalternate position of key number 56 is the keyboard clicker on/off switch.
4. Key 76 is enter (NL on data entry keypunch typewriters) and is typamatic.

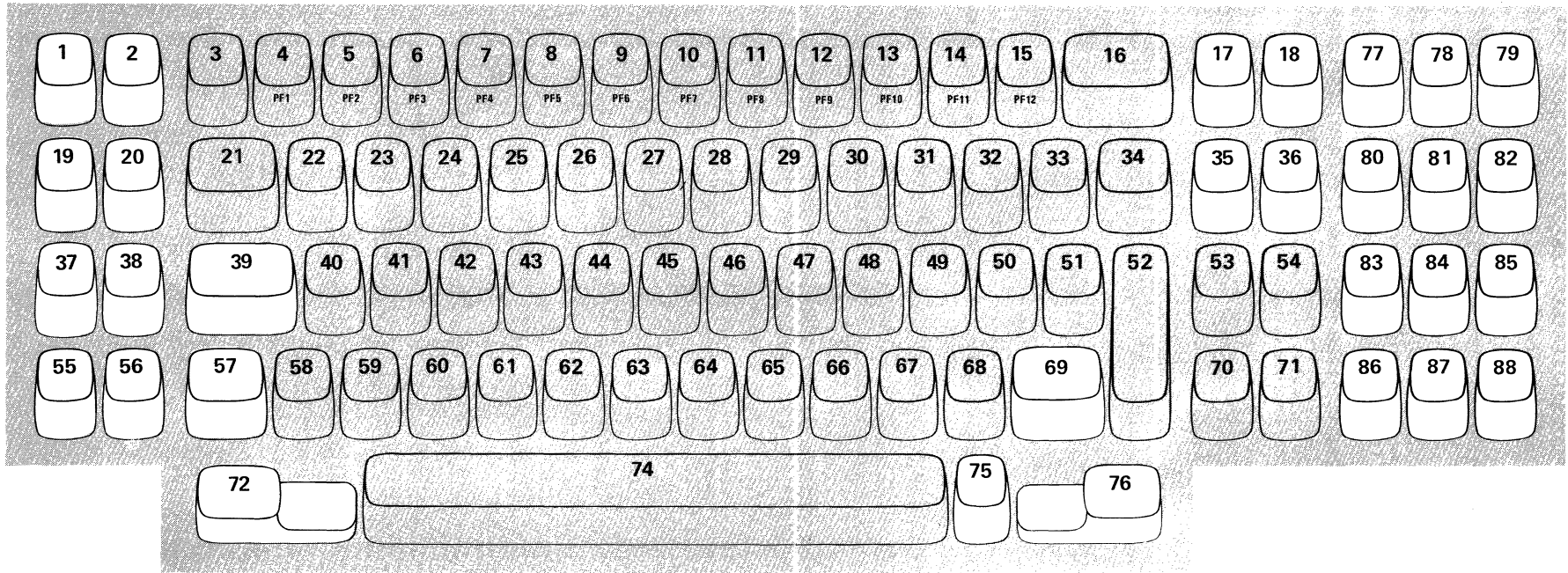
Figure 3-1. 75-Key Keyboard, Key Position Numbers



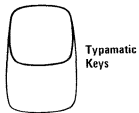
**Notes:**

1. The key face character/symbols shown on the keyboard layouts in this chapter require that the alternate (ALT) key be held pressed first.
2. The nonalternate position of key number 56 is the keyboard clicker on/off switch.
3. Key 52 is NL; key 76 is enter and typamatic.
4. Keys 51A and 57 are shifts and non-typamatic.

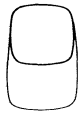
**Figure 3-2. 76-Key Japanese (Katakana) Keyboard, Key Position Numbers**



**LEGEND:**



Typamatic  
Keys

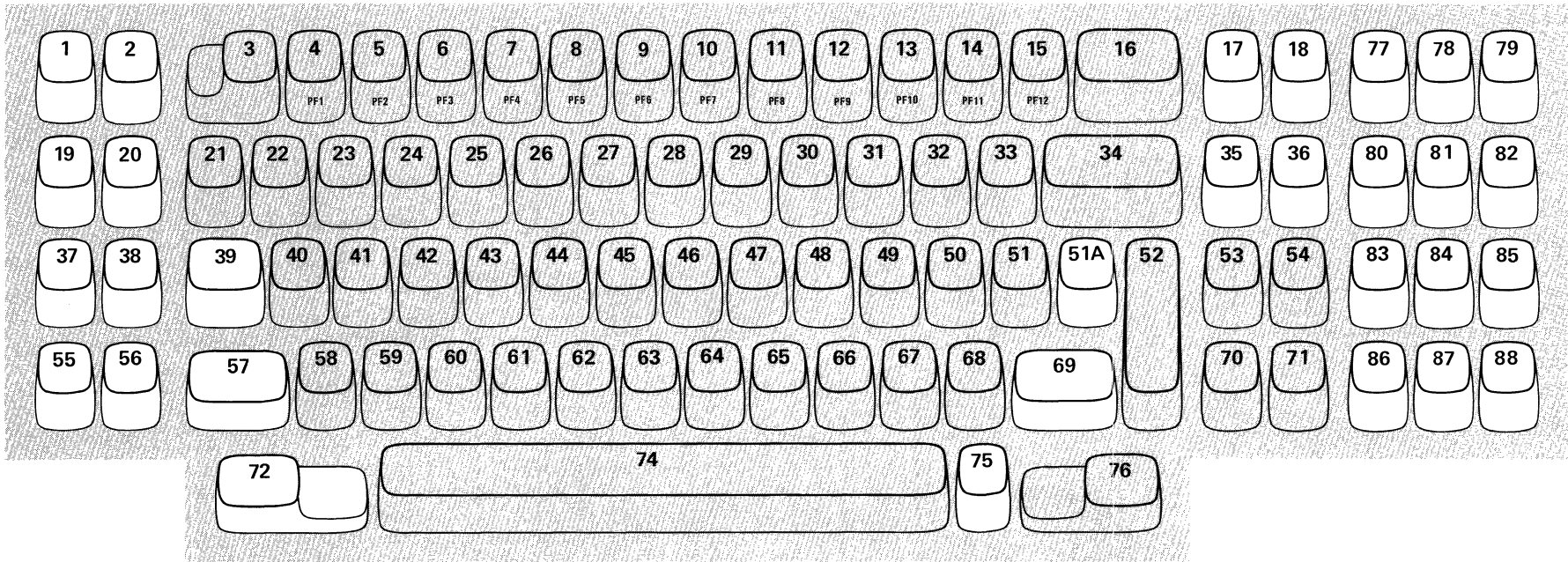


Non-Typamatic  
Keys

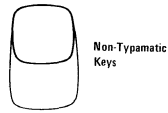
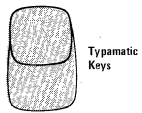
**Notes:**

1. The key face and all character/symbols shown on the keyboard layouts in this chapter require that the alternate (ALT) key be held pressed first.
2. The nonalternate position of key number 56 is the keyboard clicker on/off switch.
3. Key 76 is enter (NL on data entry keypunch typewriters) and is typamatic.

**Figure 3-3. 87-Key Keyboard, Key Position Numbers**

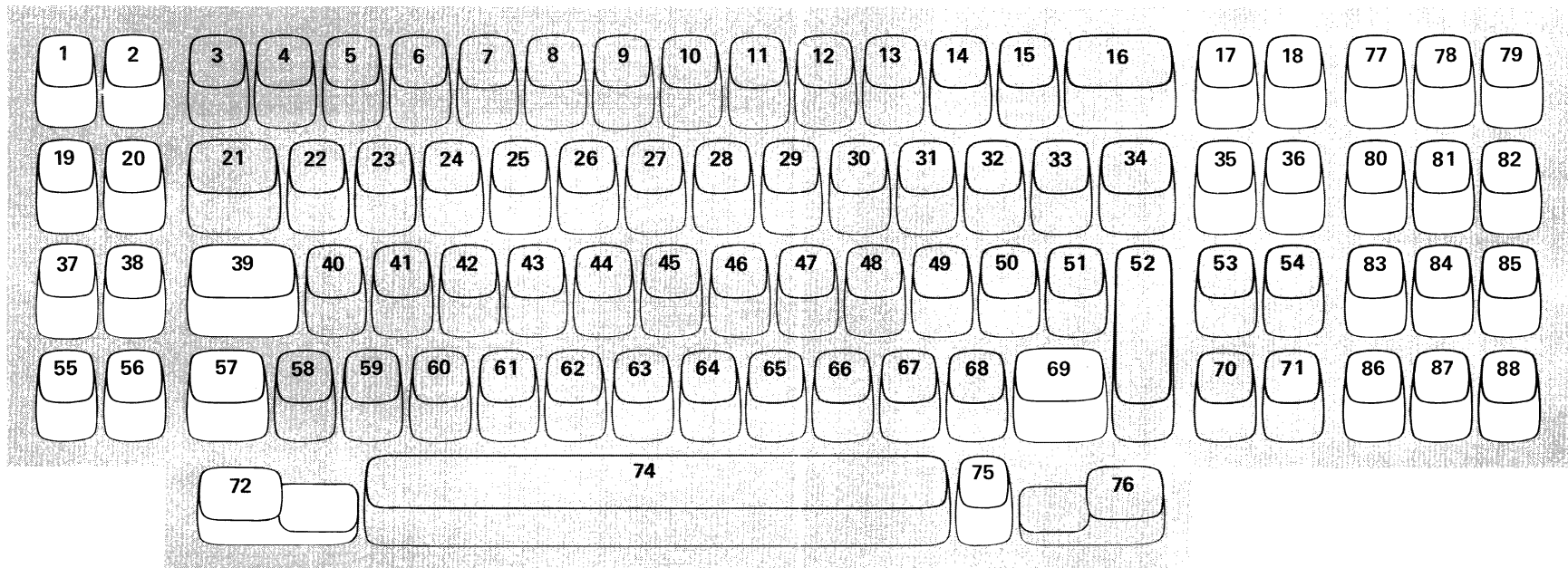


## LEGEND:

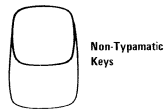
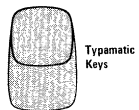
*Notes:*

1. The key face character/symbols shown on the keyboard layouts in this chapter require that the alternate (ALT) be held pressed first.
2. The nonalternate position of key number 56 is the keyboard clicker on/off switch.

**Figure 3-4.** 88-Key Japanese (English) and Japanese (Katakana) Keyboard, Key Position Numbers



**LEGEND:**

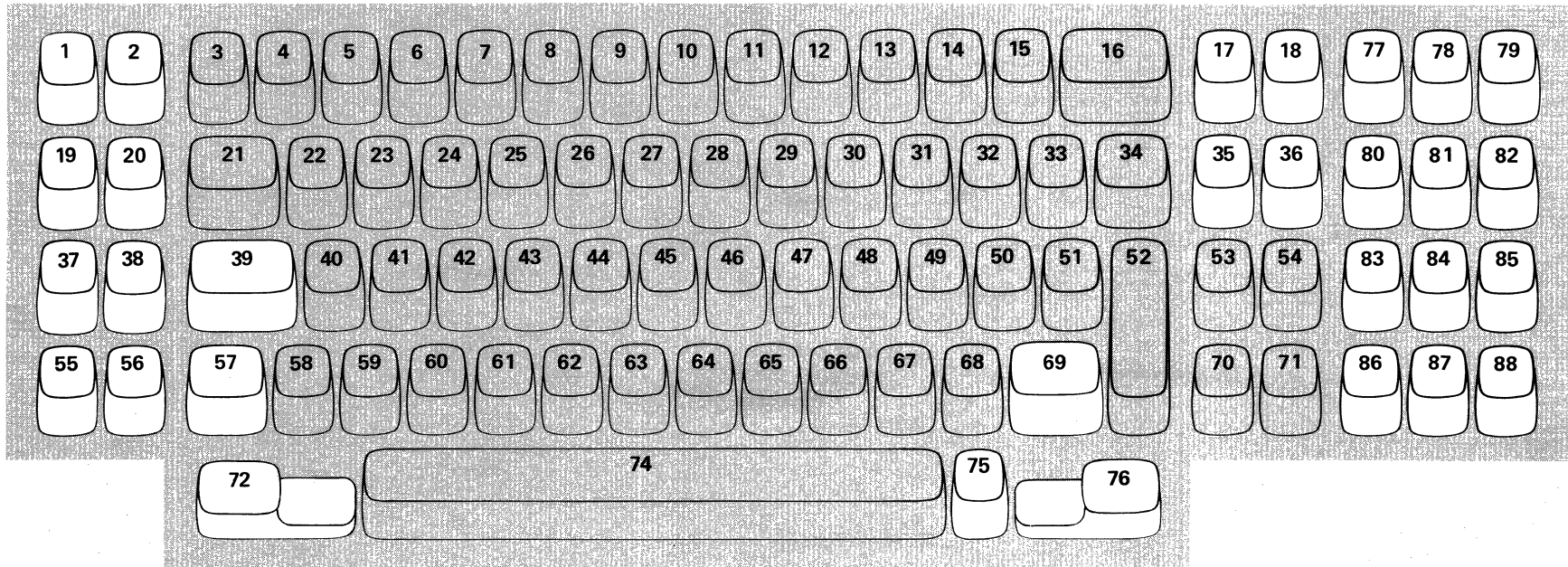


**Notes:**

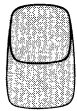
1. The key face character/symbols shown on the keyboard layouts in this chapter require that the alternate (ALT) key be held pressed first.
2. The nonalternate position of key number 56 is the keyboard clicker on/off switch.
3. Key 76 is enter (NL on data entry keypunch typewriters) and is typamatic.
4. Key 16 is the APL ON/OFF key.

**Figure 3-5. 87-Key EBCDIC Typewriter/APL Keyboard, Key Position Numbers**





**LEGEND:**



Typamatic  
Keys



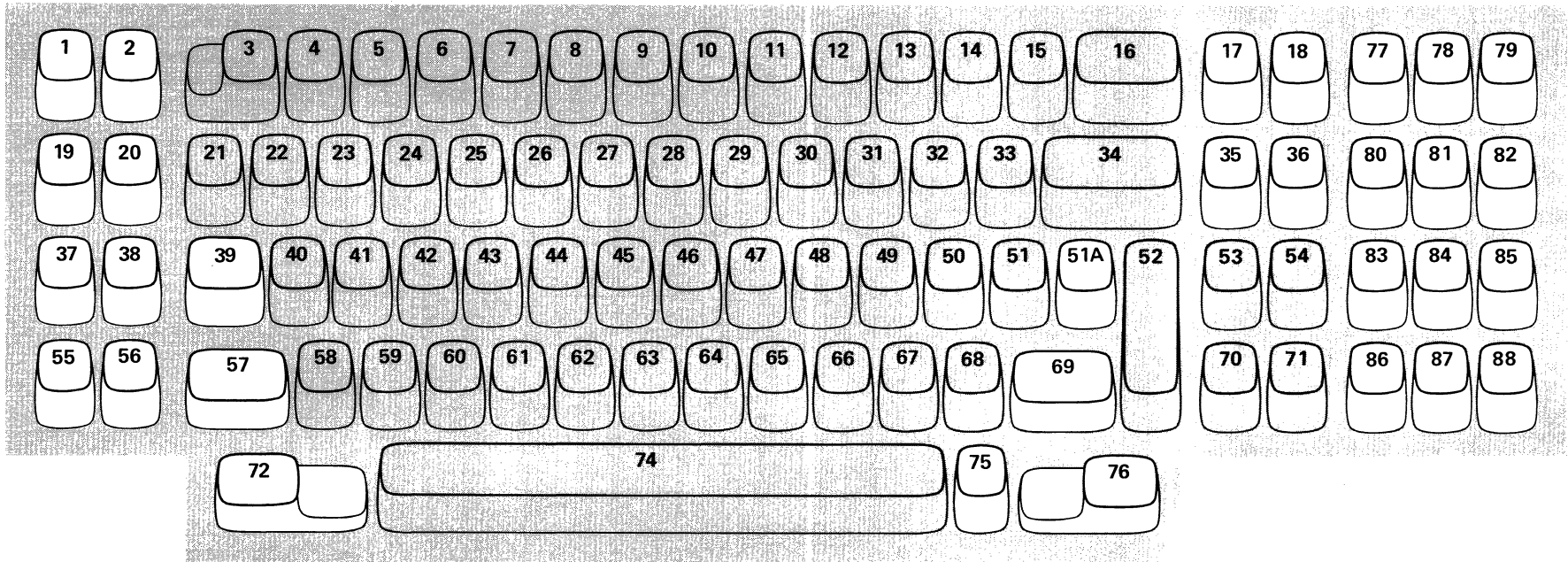
Non-Typamatic  
Keys

**Notes:**

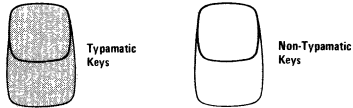
1. The key face character/symbols shown on the keyboard layouts in this chapter require that the alternate (ALT) key be held pressed first.
2. The nonalternate position of key number 56 is the keyboard clicker on/off switch.
3. Key 76 is enter (NL on data entry keypunch typewriters) and is typamatic.
4. Key 16 is the Text ON/OFF key.

**Figure 3-6. 87-Key EBCDIC Typewriter/Text Keyboard, Key Position Numbers**





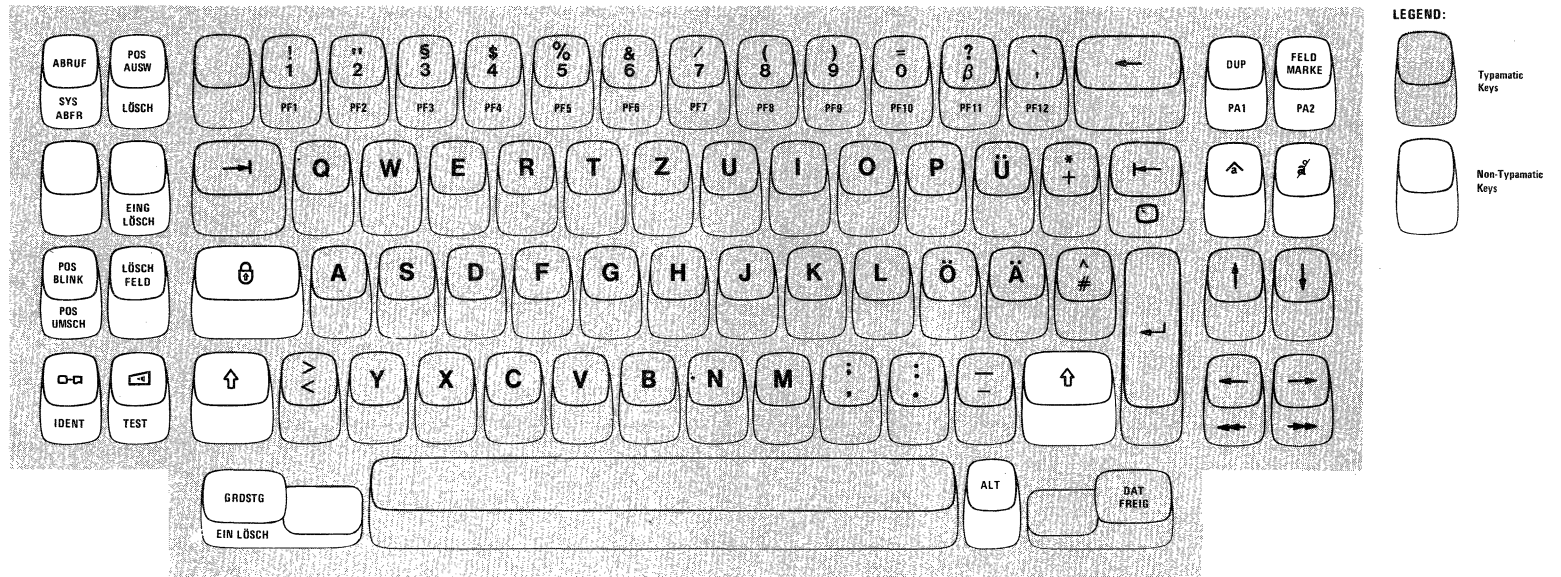
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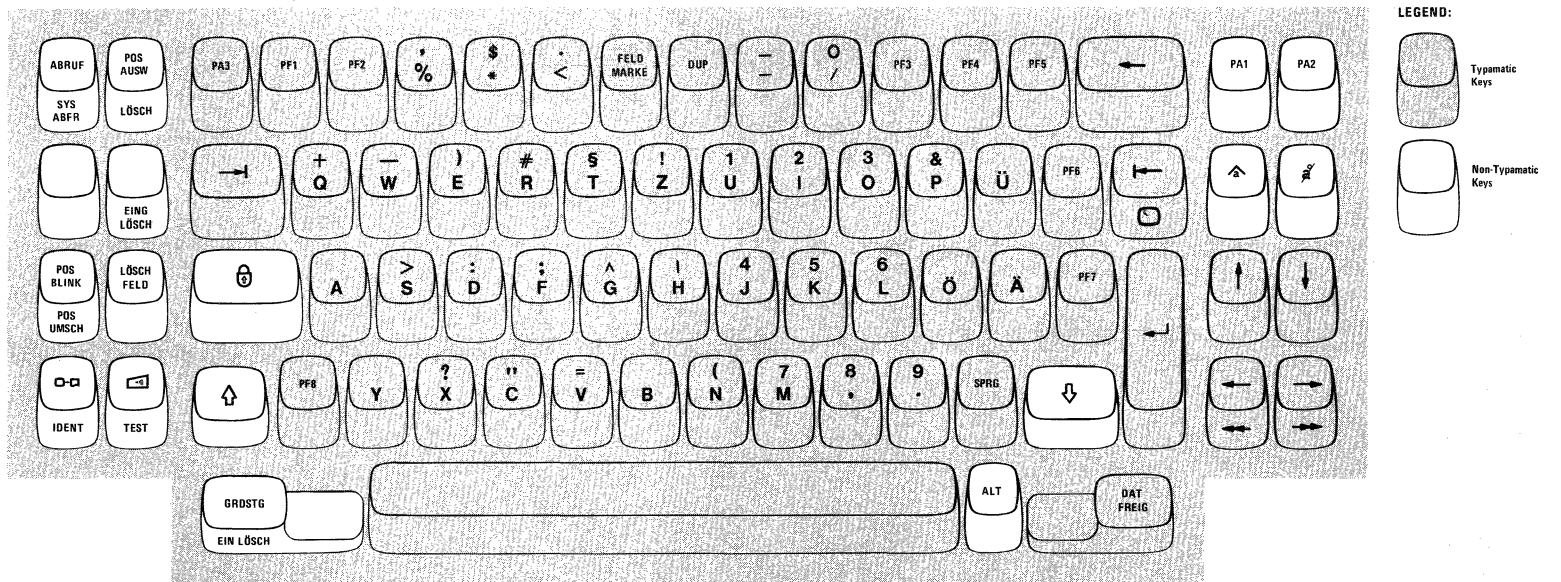
**Notes:**

1. The key face character/symbols shown on the keyboard layouts in this chapter require that the alternate (ALT) key be held pressed first.
2. The nonalternate position of key number 56 is the keyboard clicker on/off switch.
3. Key 16 is the APL ON/OFF key.

**Figure 3-7. 88-Key Japanese (English) and Japanese (Katakana) Typewriter/APL Keyboards, Key Position Numbers**

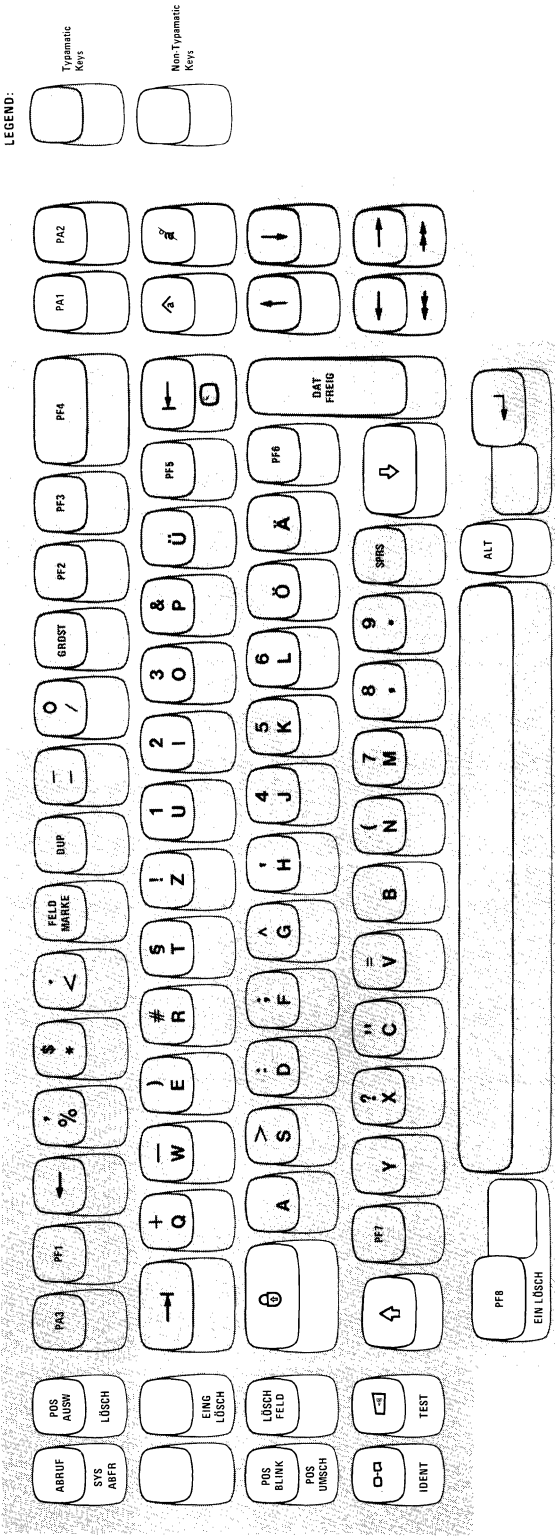


Typewriter Keyboard

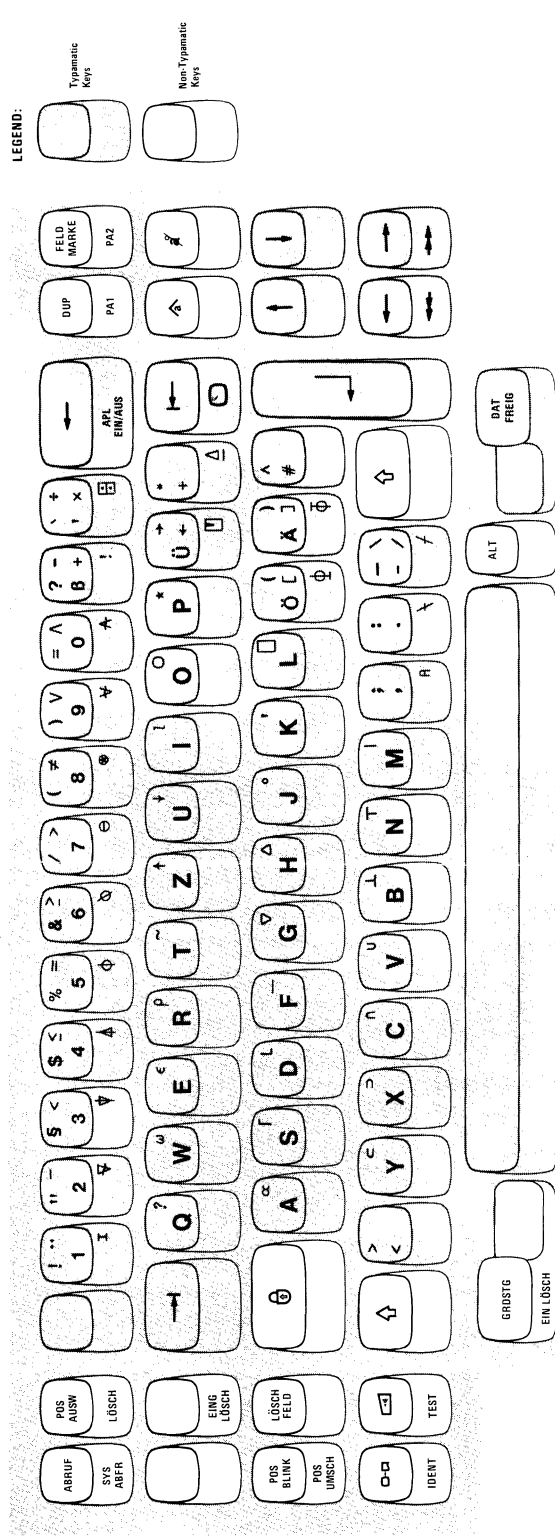


Data Entry Keyboard

Figure 3-8 (Part 1 of 2). Austrian/German Keyboards

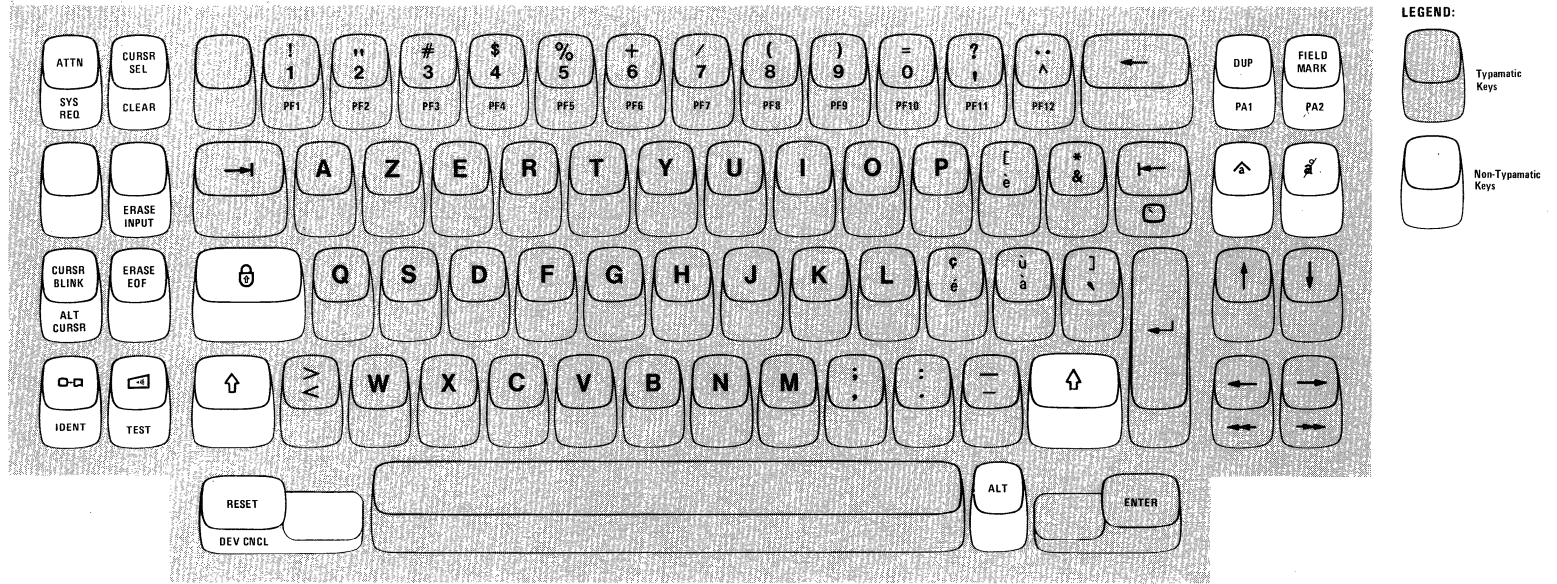


Data Entry Keypunch Keyboard

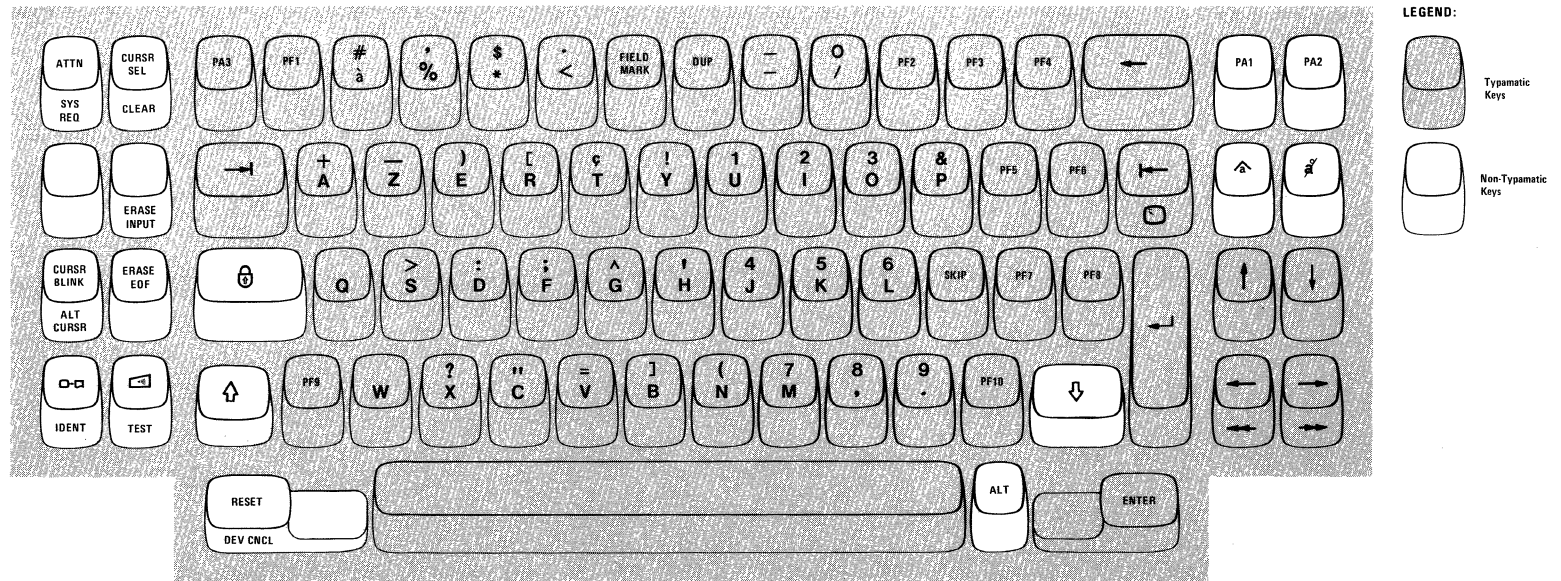


APL Keyboard

Figure 3-8 (Part 2 of 2). Austrian/German Keyboards

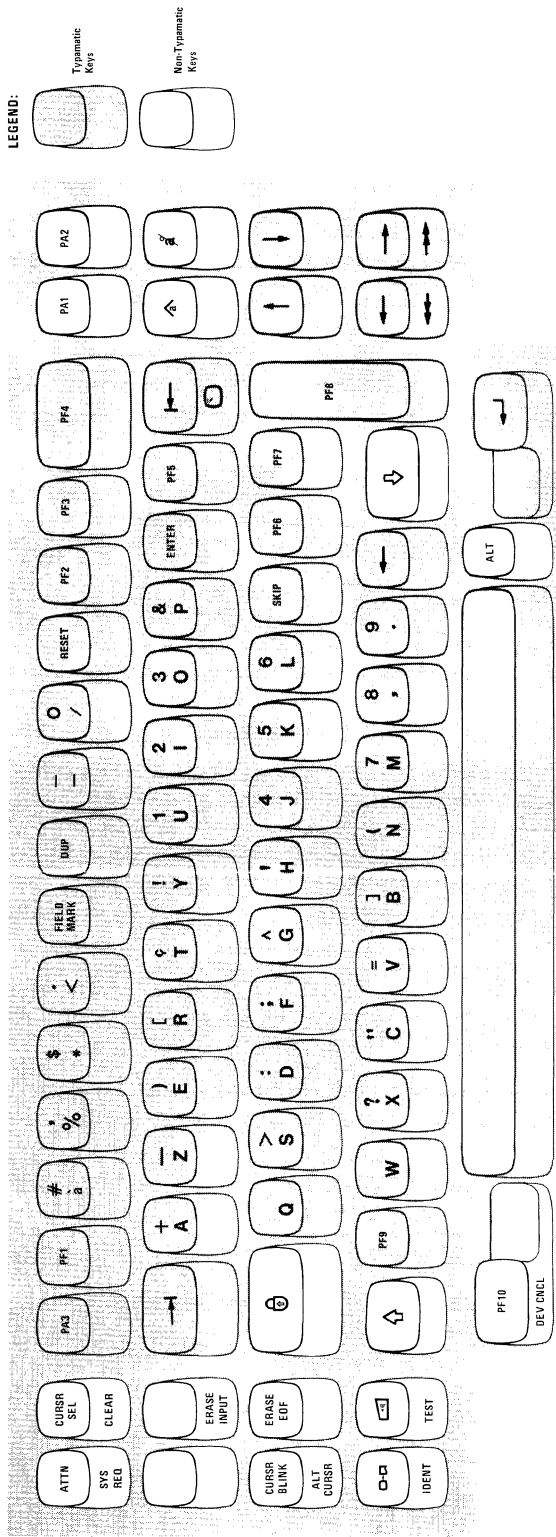


Typewriter Keyboard

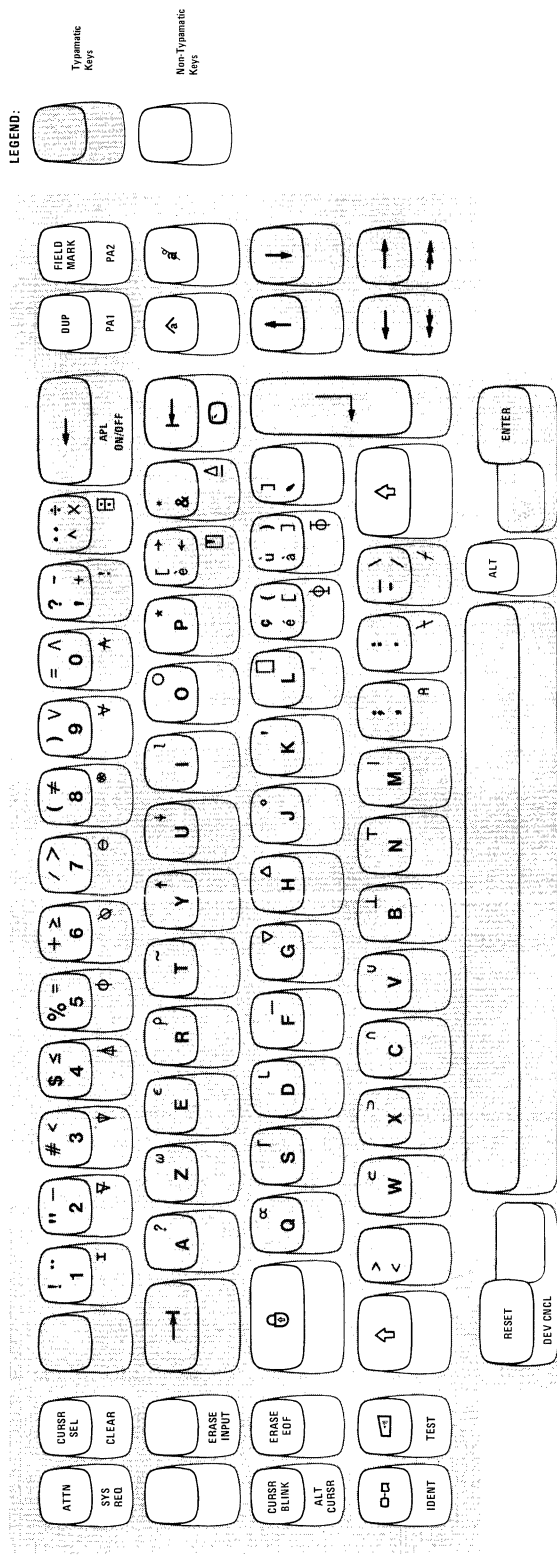


Data Entry Keyboard

Figure 3-9 (Part 1 of 2). Belgian Keyboards



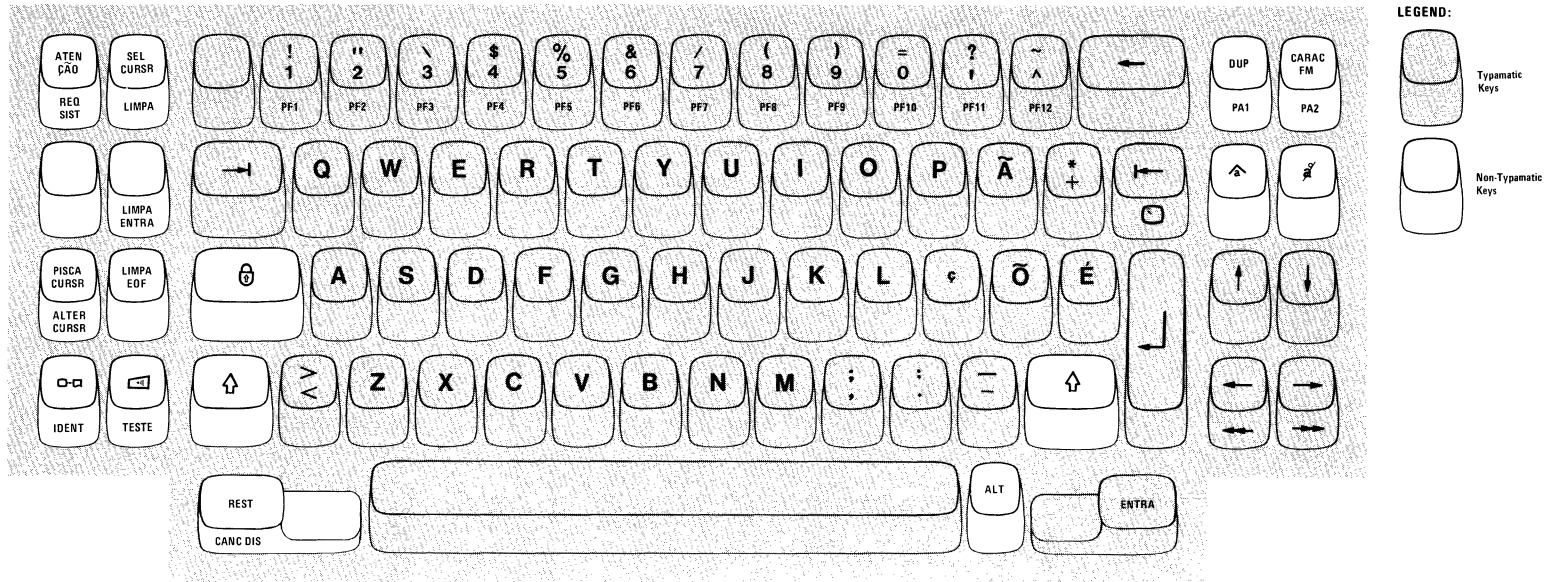
**Data Entry Keypunch Keyboard**



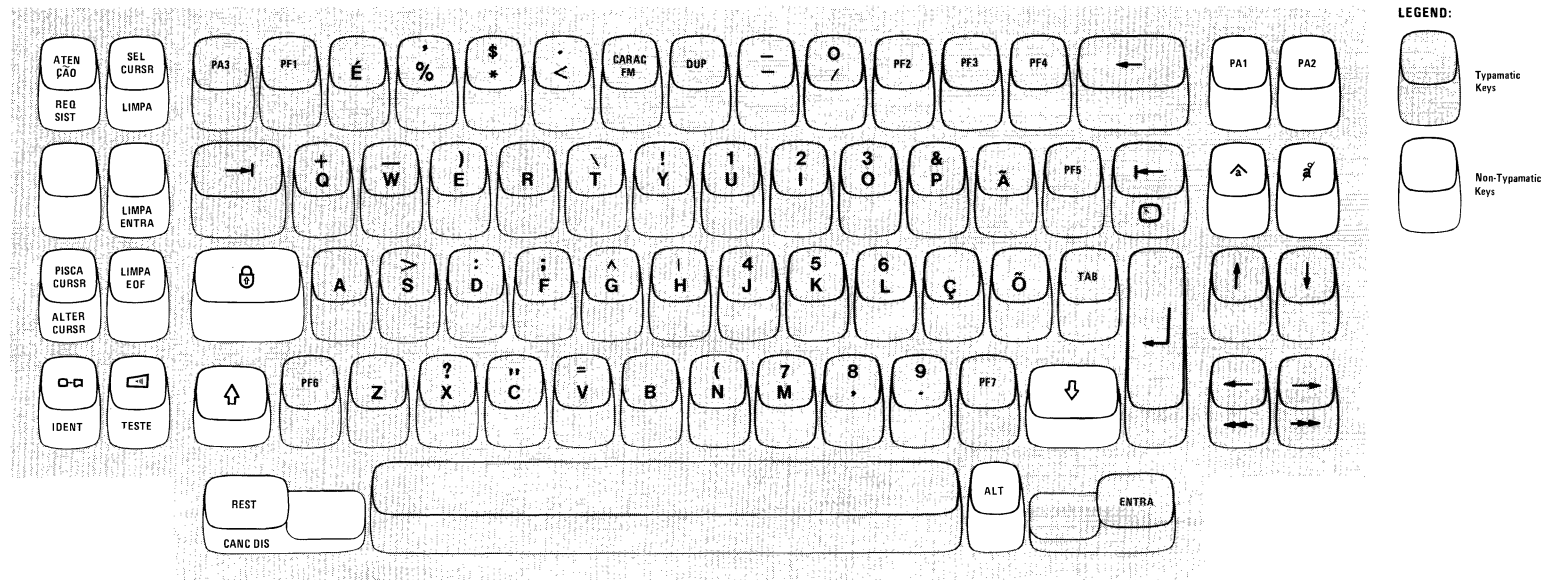
**APL Keyboard**

**Figure 3-9 (Part 2 of 2). Belgian Keyboards**



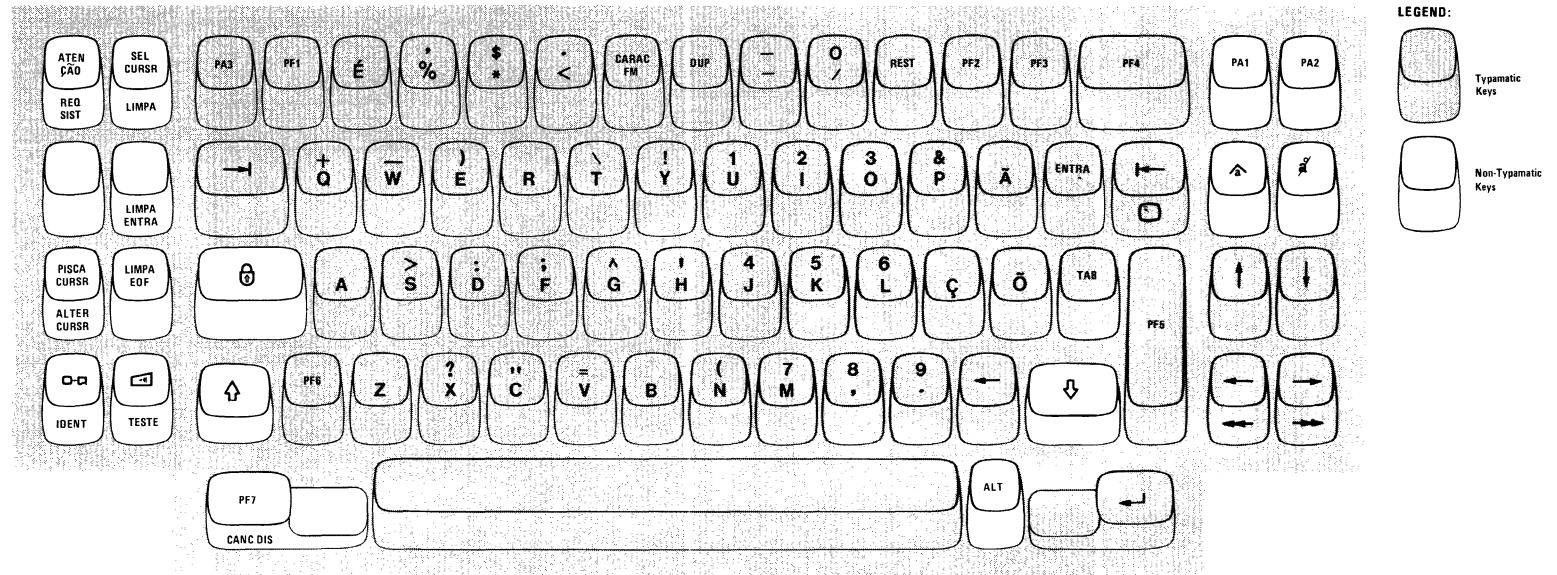


Typewriter Keyboard

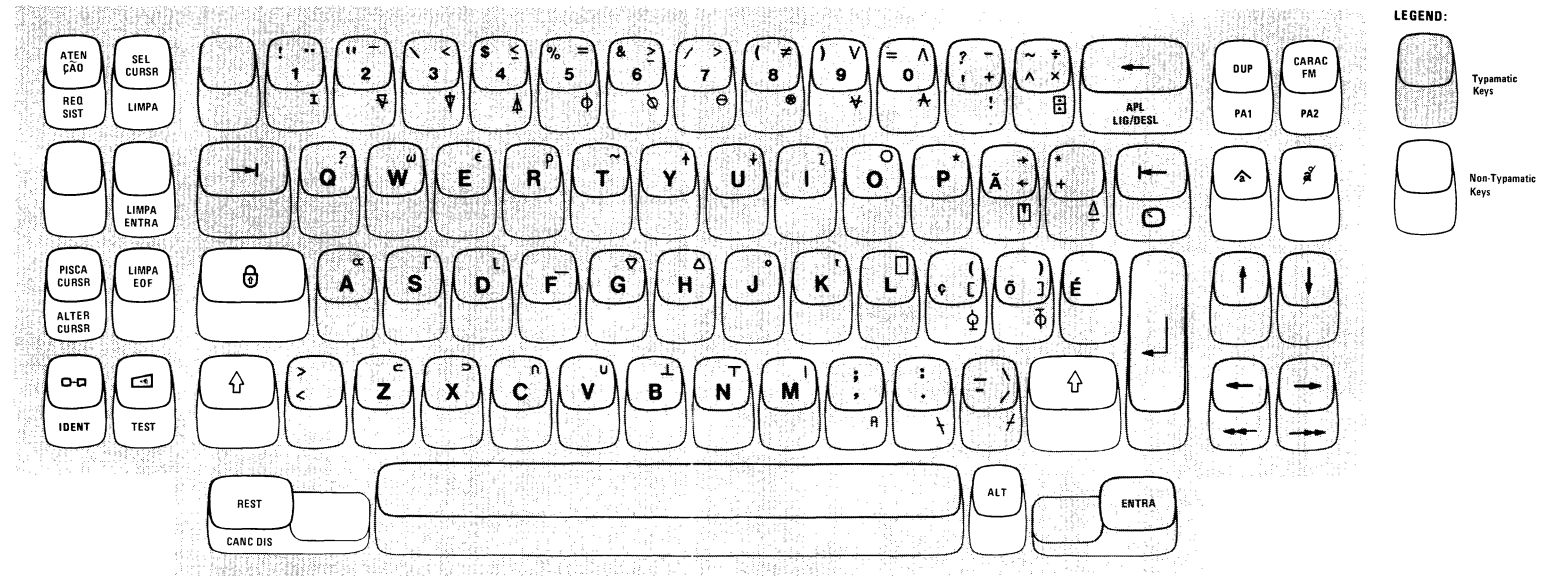


Data Entry Keyboard

Figure 3-10 (Part 1 of 2). Brazilian/Portuguese Keyboards

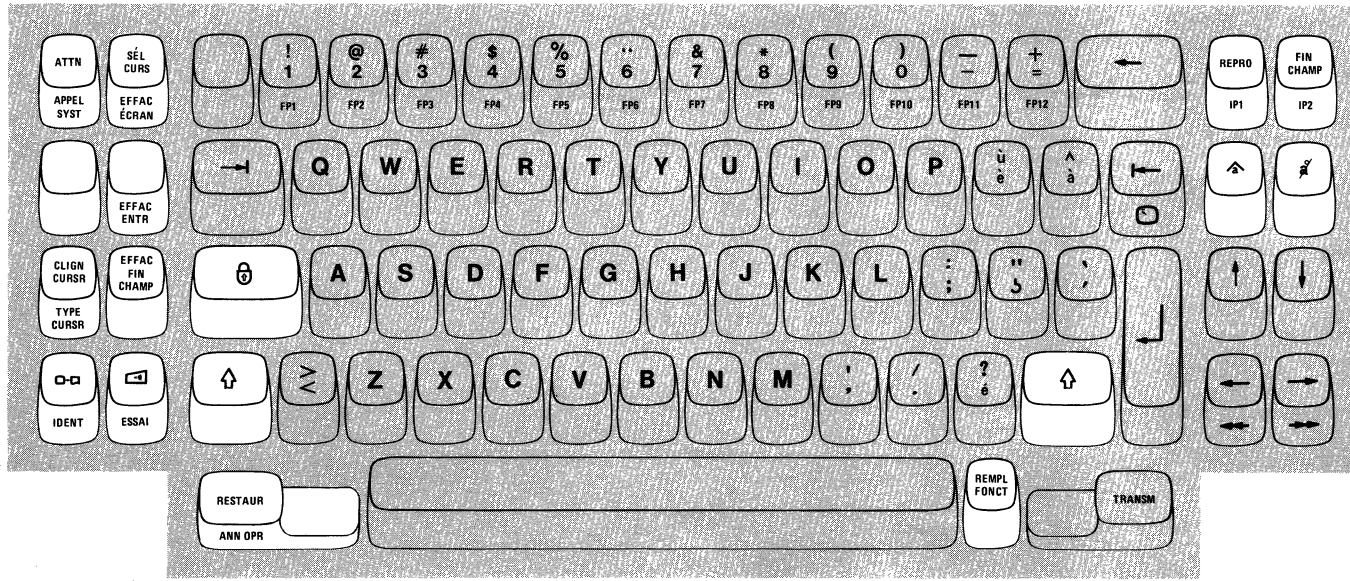


Data Entry Keypunch Keyboard

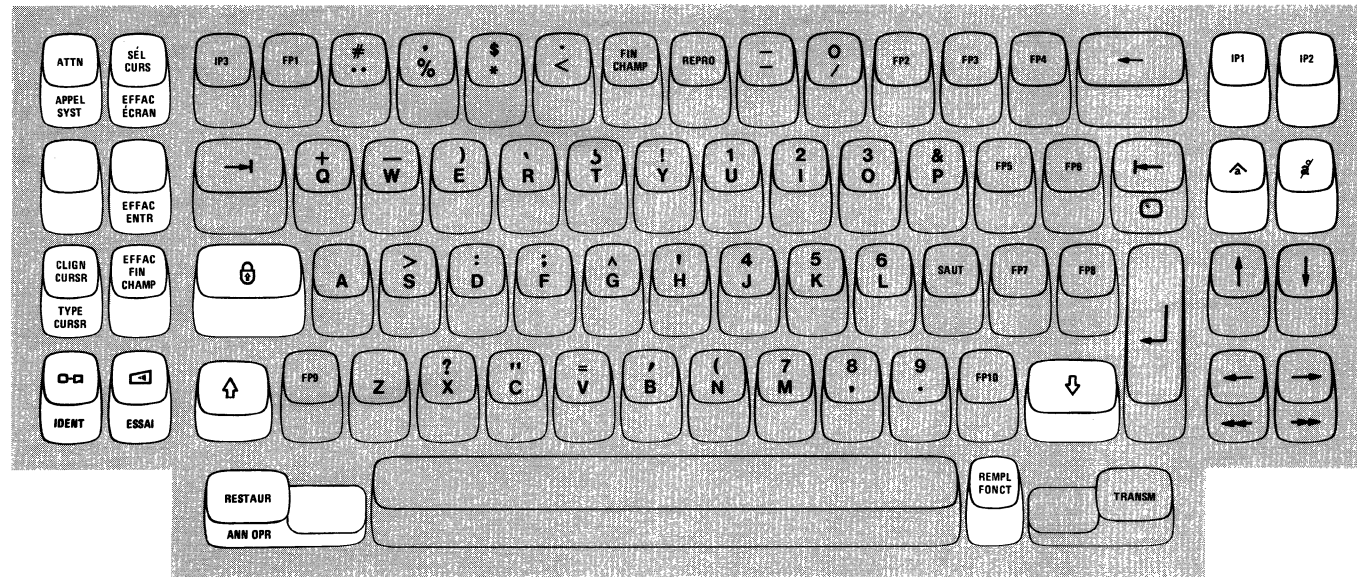


APL Keyboard

Figure 3-10 (Part 2 of 2). Brazilian/Portuguese Keyboards



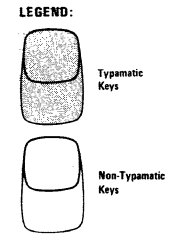
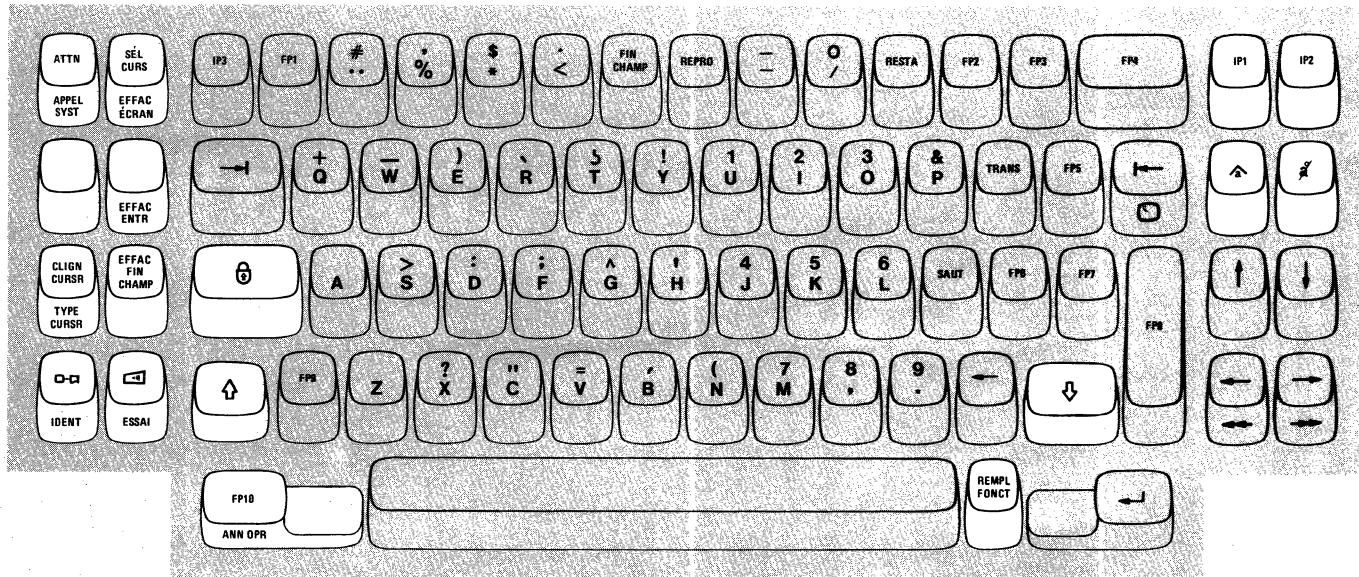
Typewriter Keyboard



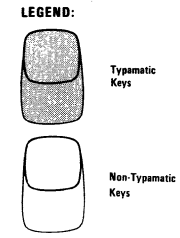
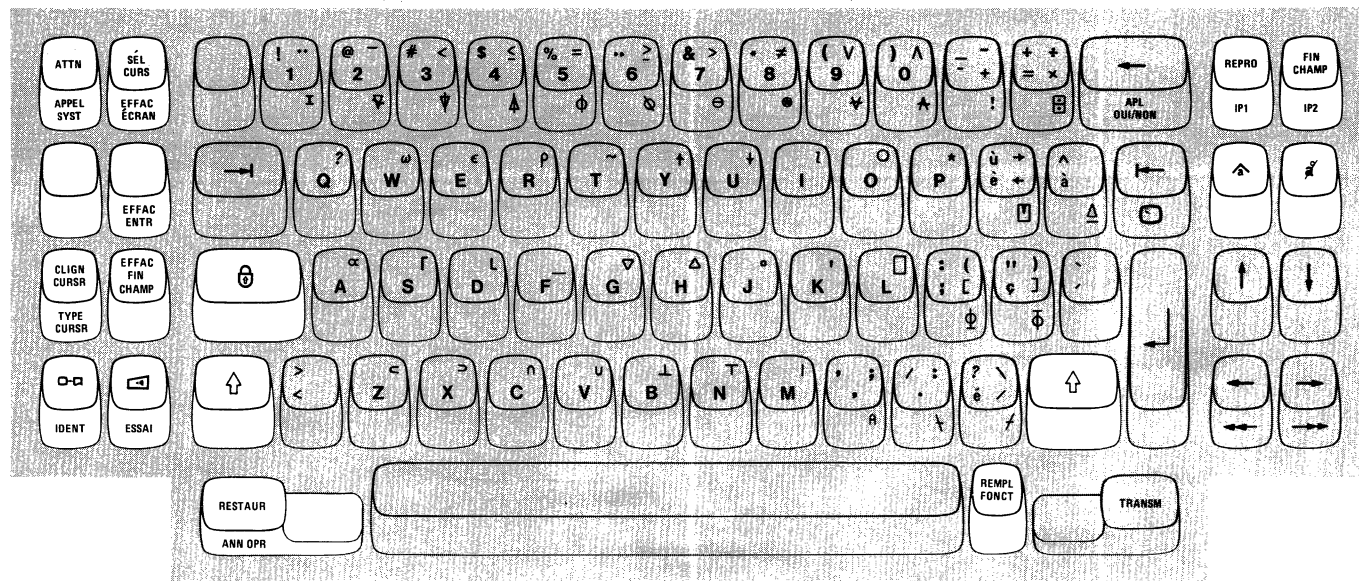
Data Entry Keyboard

Figure 3-11 (Part 1 of 2). Canadian (French) Keyboards



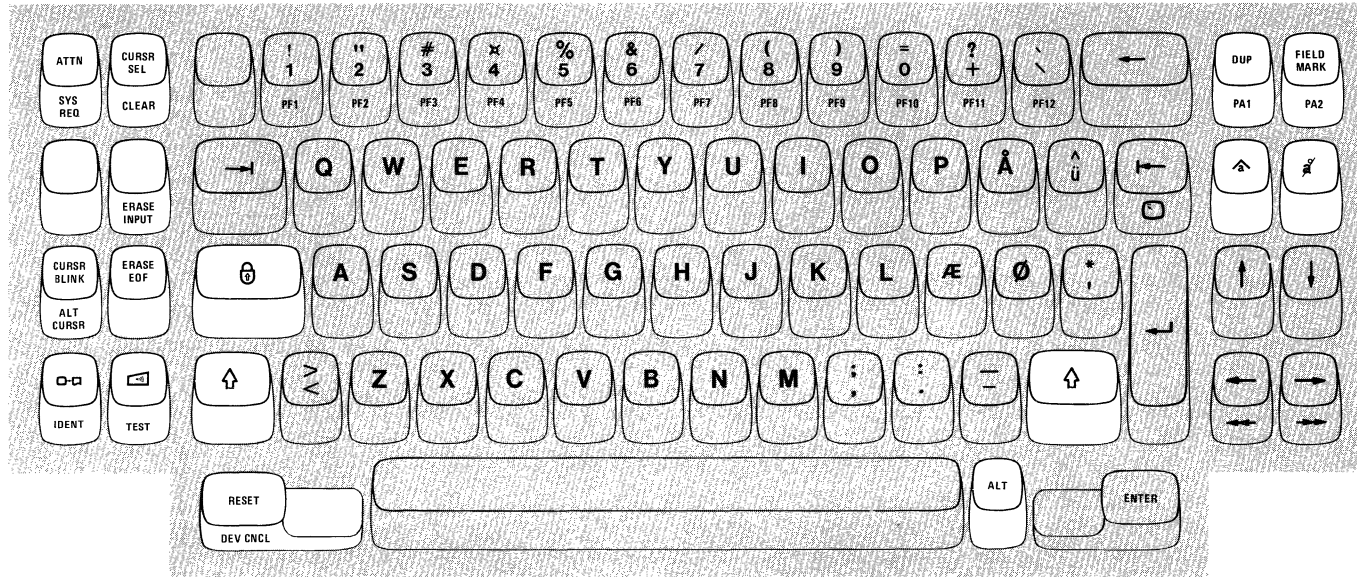


Data Entry Keypunch Keyboard

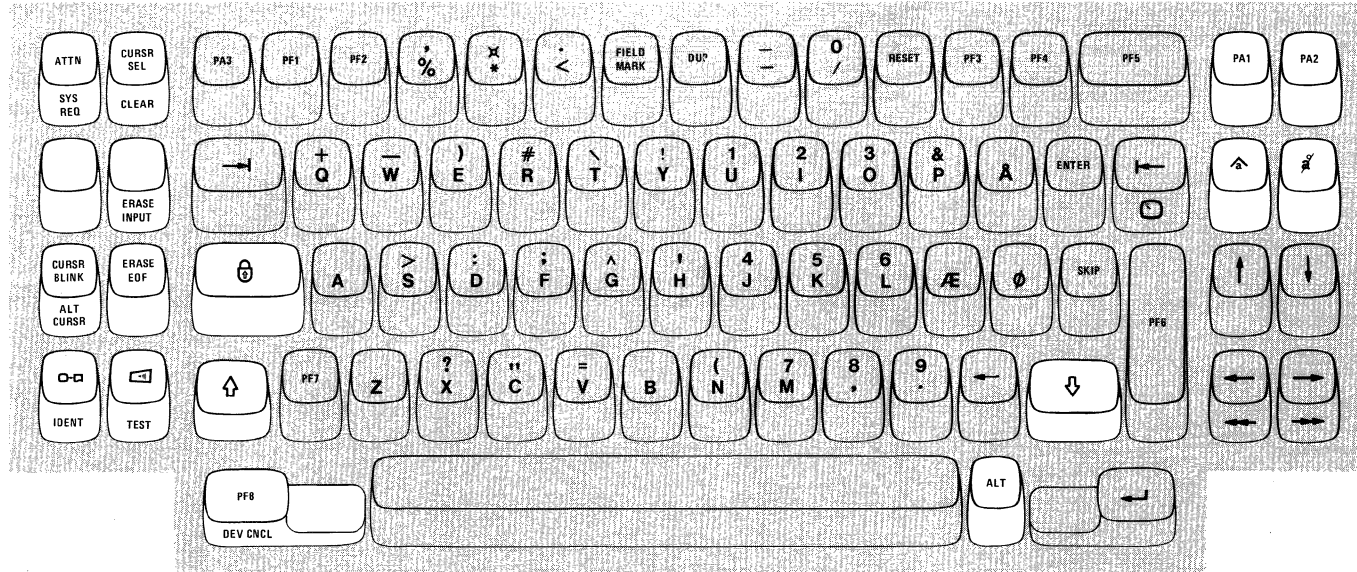


APL Keyboard

Figure 3-11 (Part 2 of 2). Canadian (French) Keyboards



Typewriter Keyboard



Data Entry Keyboard

Figure 3-12 (Part 1 of 2). Danish Keyboards

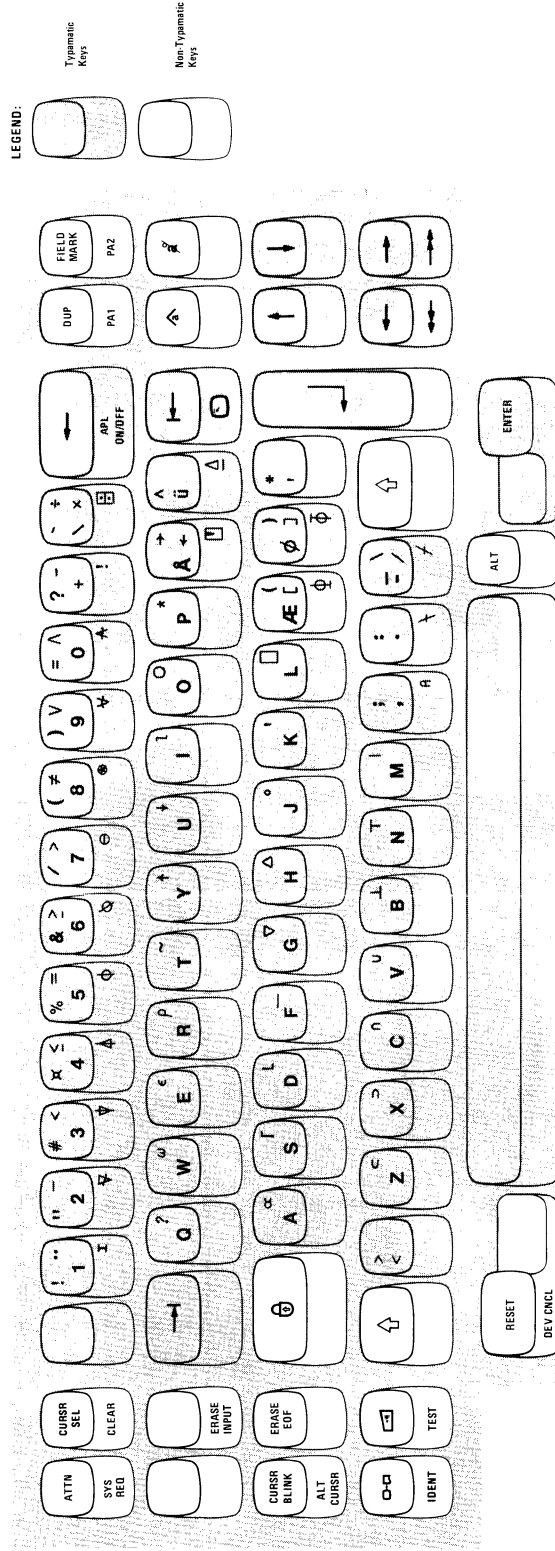
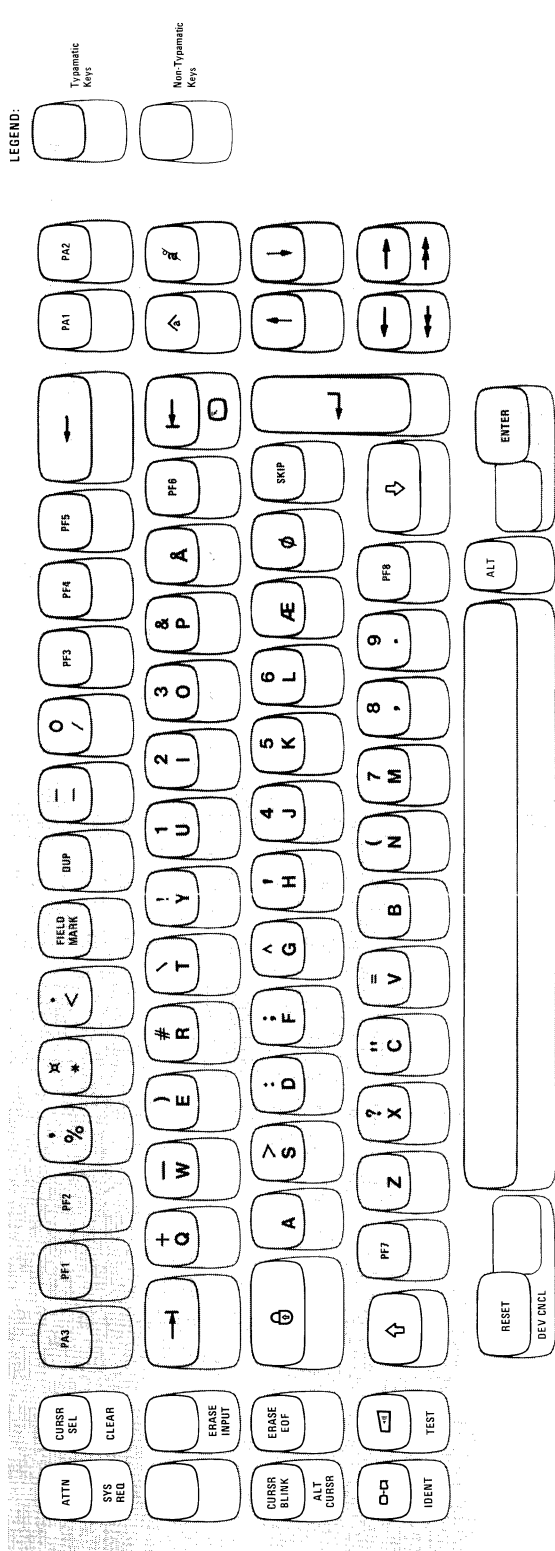
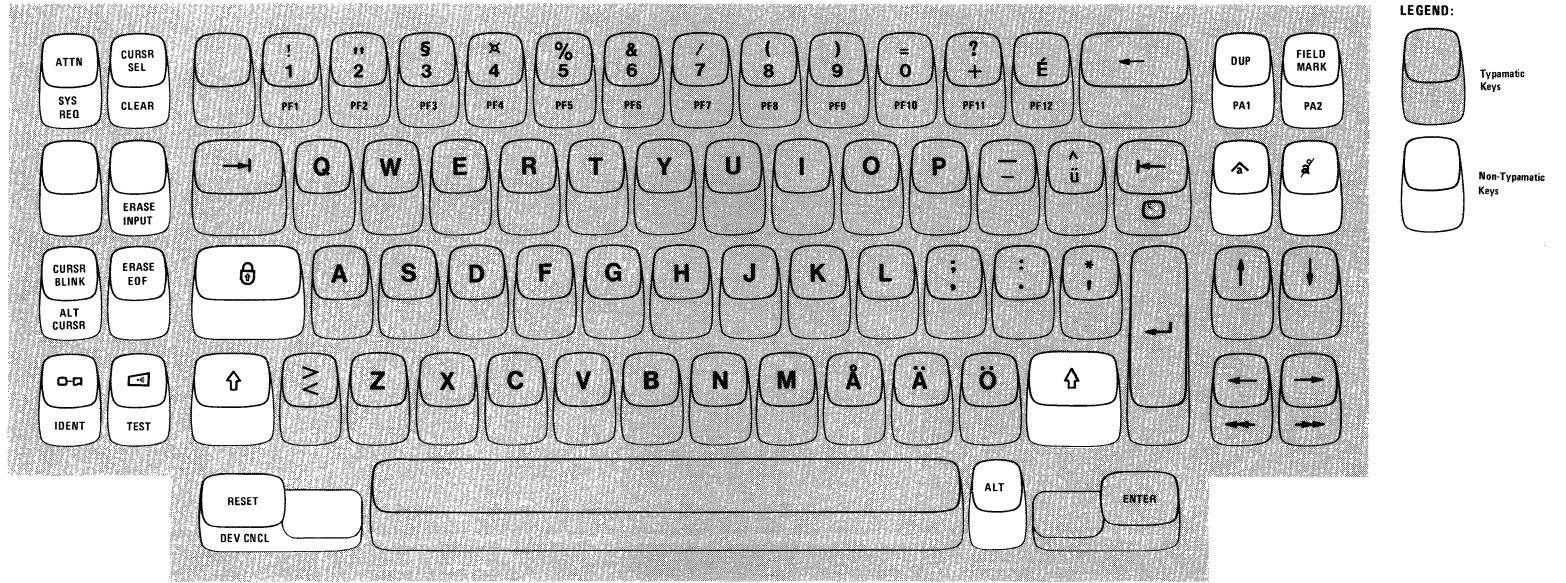
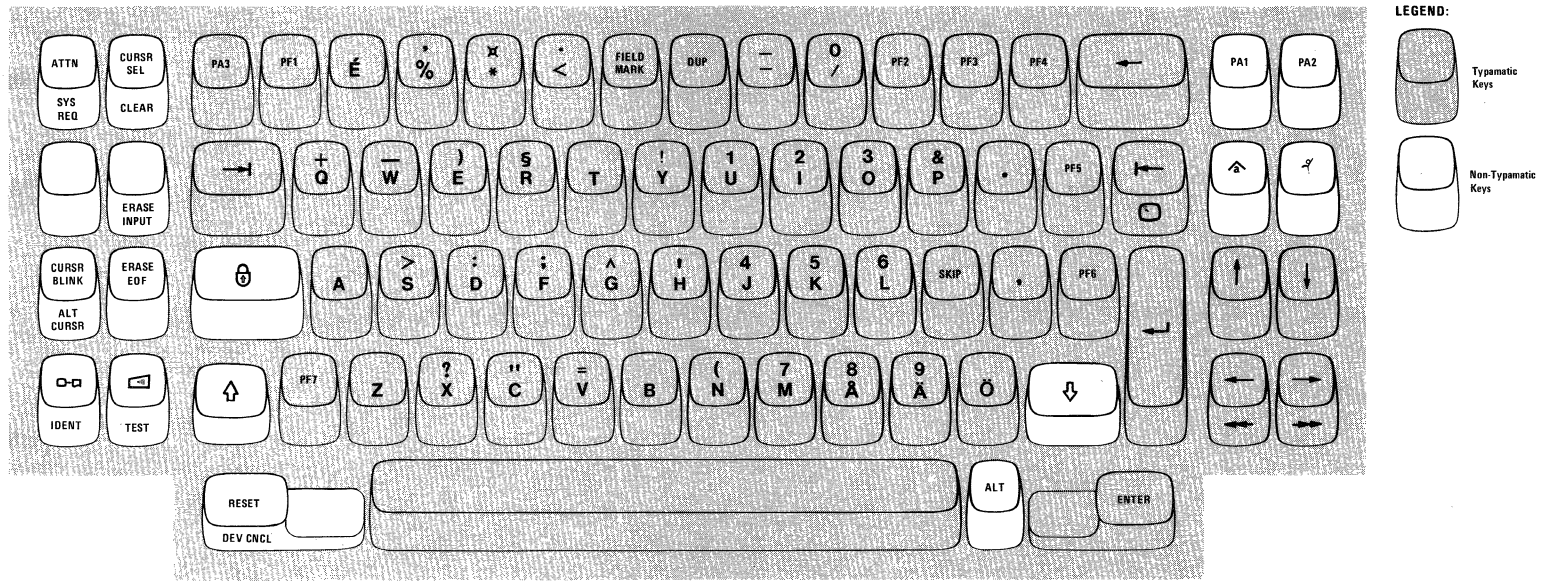


Figure 3-12 (Part 2 of 2). Danish Keyboards



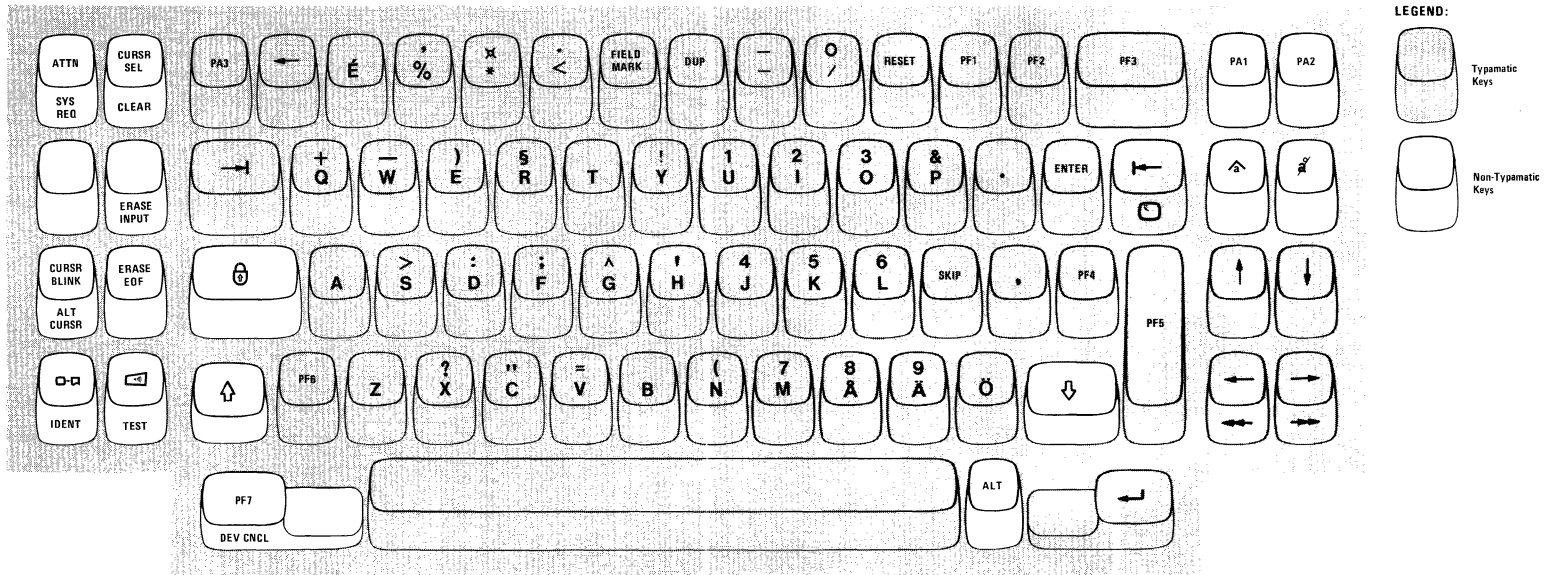
Typewriter Keyboard



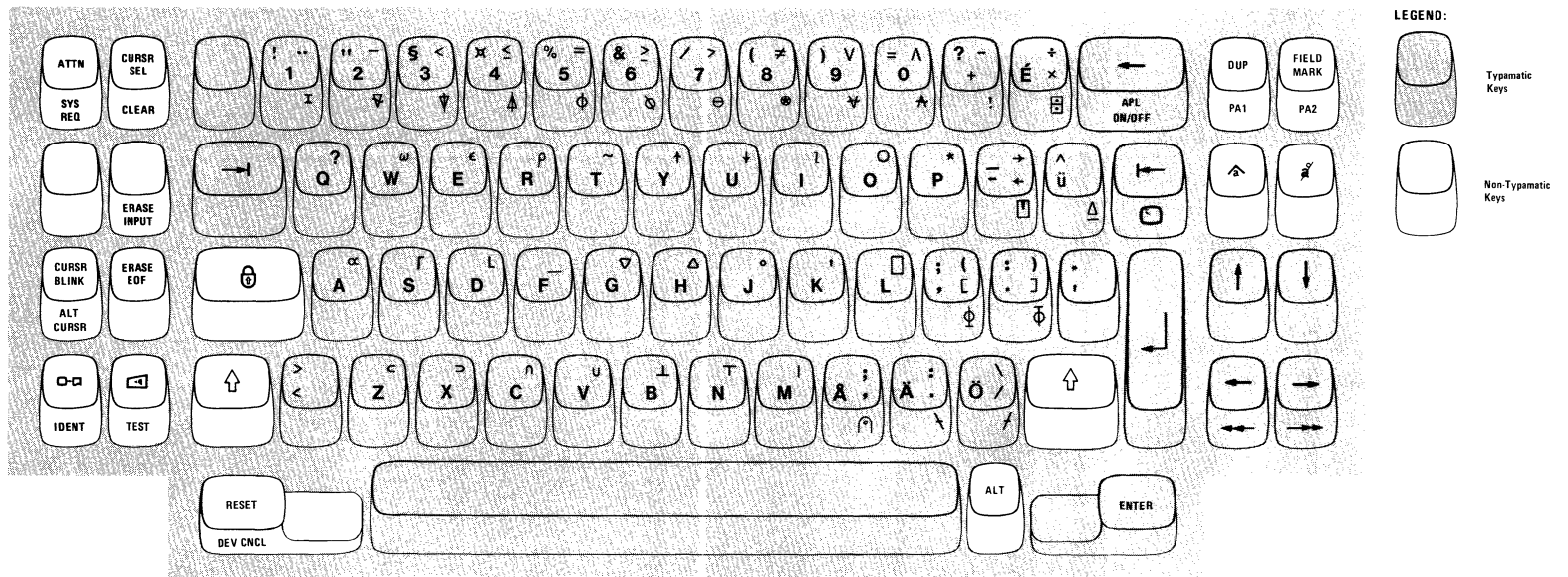
Data Entry Keyboard

Figure 3-13 (Part 1 of 2). Finnish Keyboards



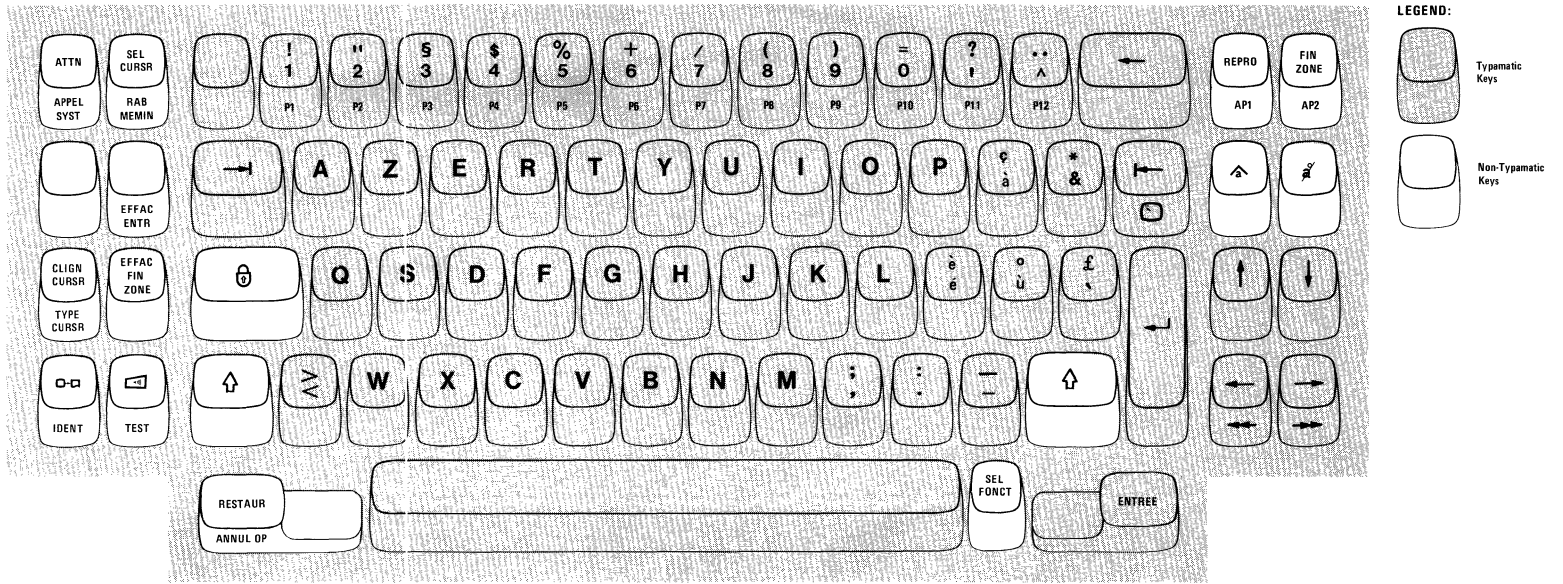


Data Entry Keypunch Keyboard

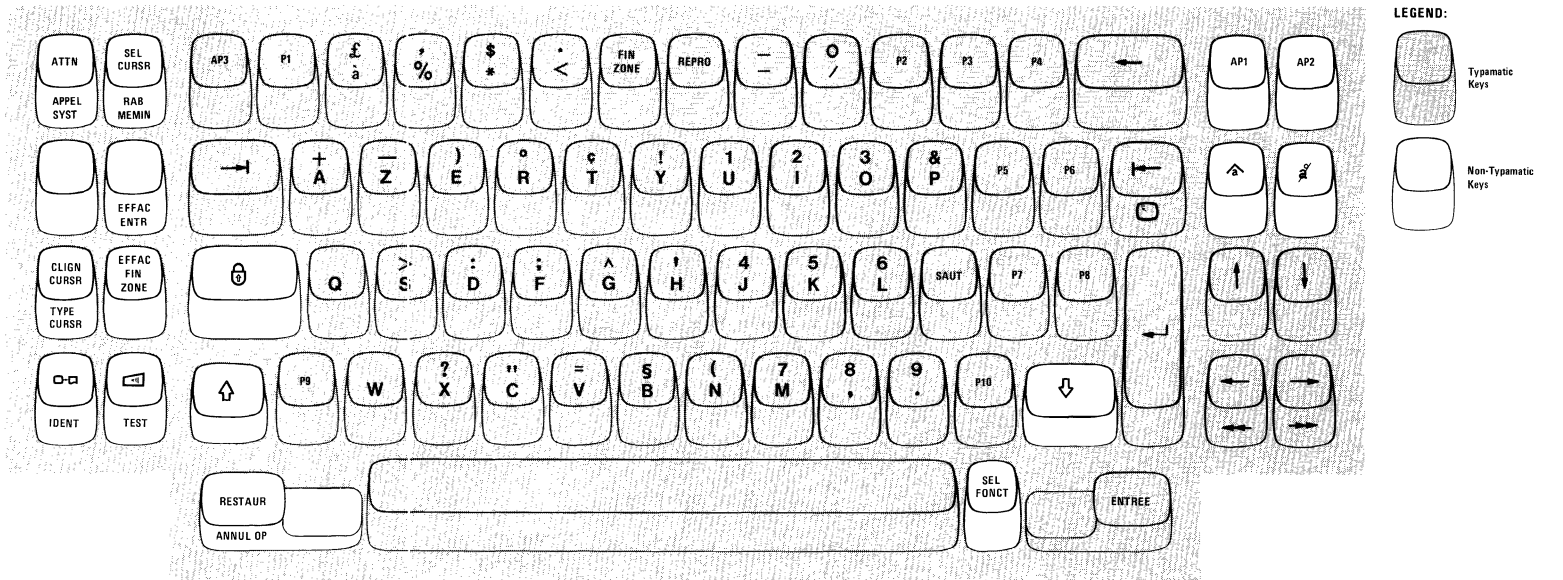


APL Keyboard

Figure 3-13 (Part 2 of 2). Finnish Keyboards

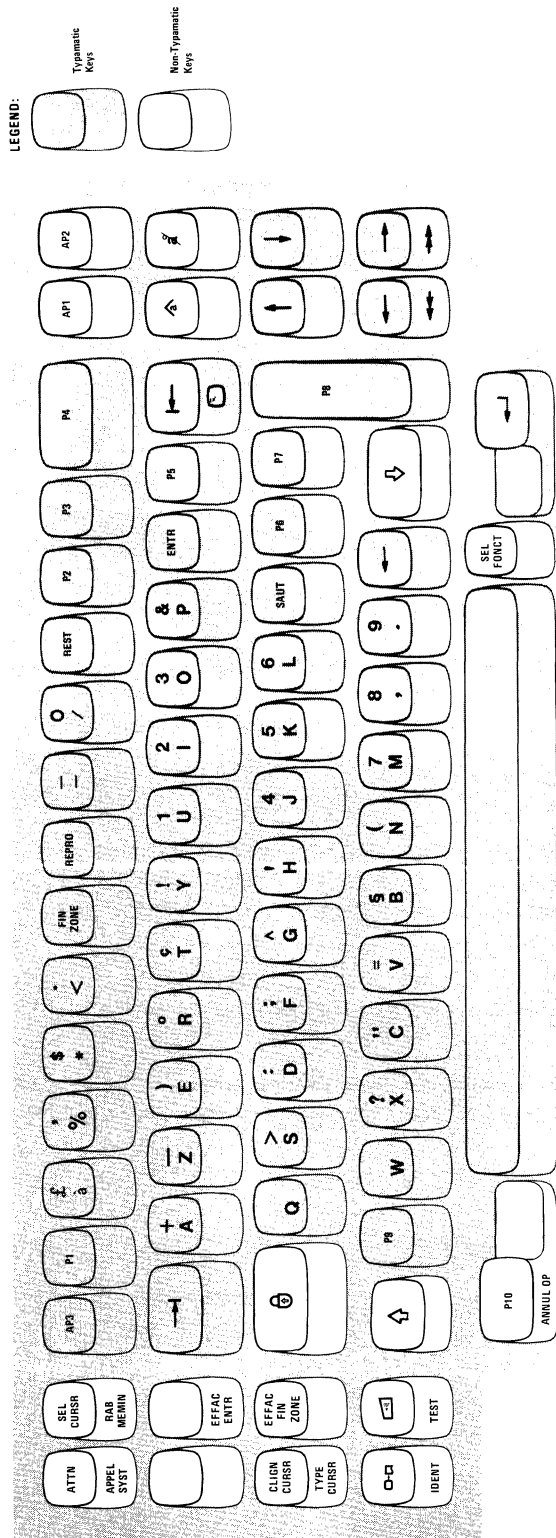


Typewriter Keyboard

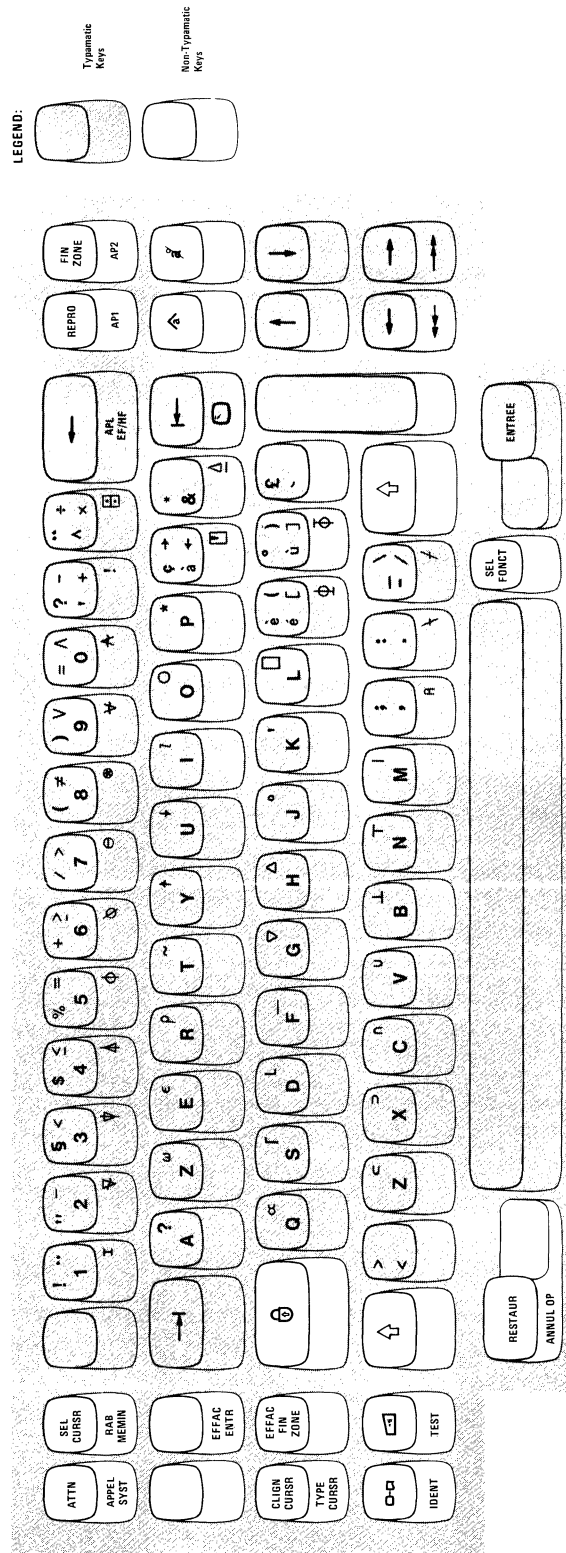


Data Entry Keyboard

Figure 3-14 (Part 1 of 2). French (AZERTY) Keyboards

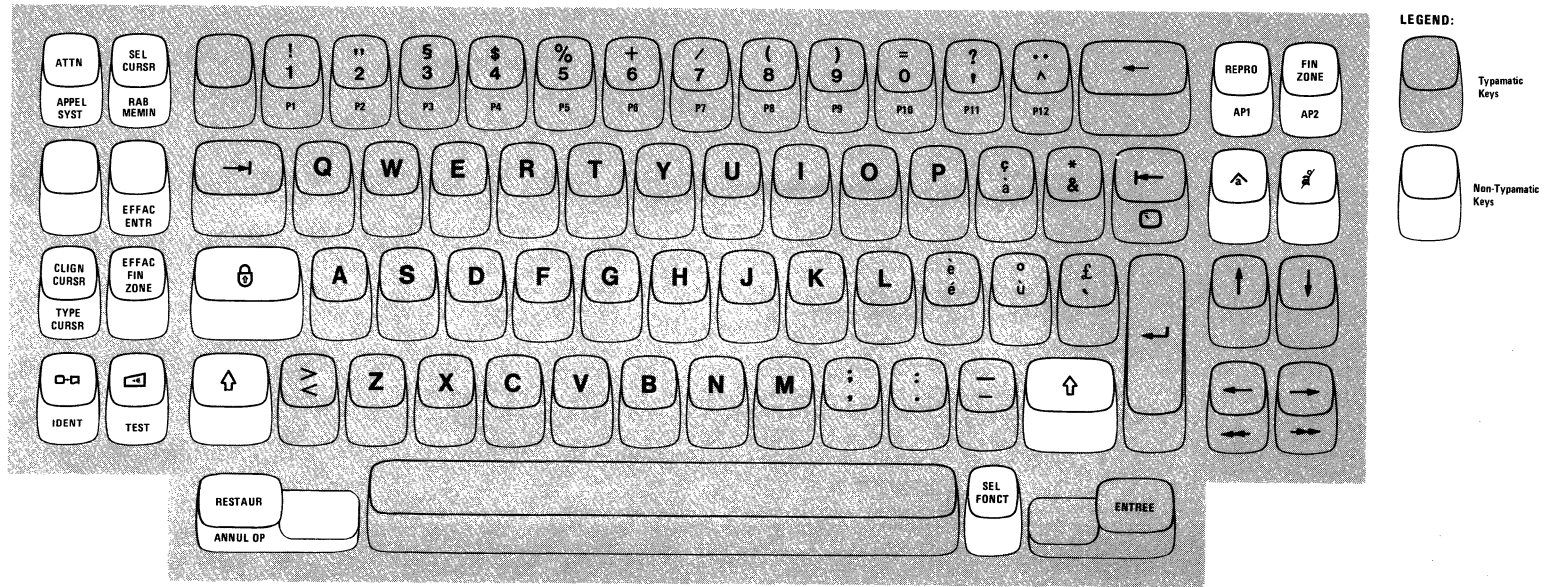


Data Entry Keypunch Keyboard

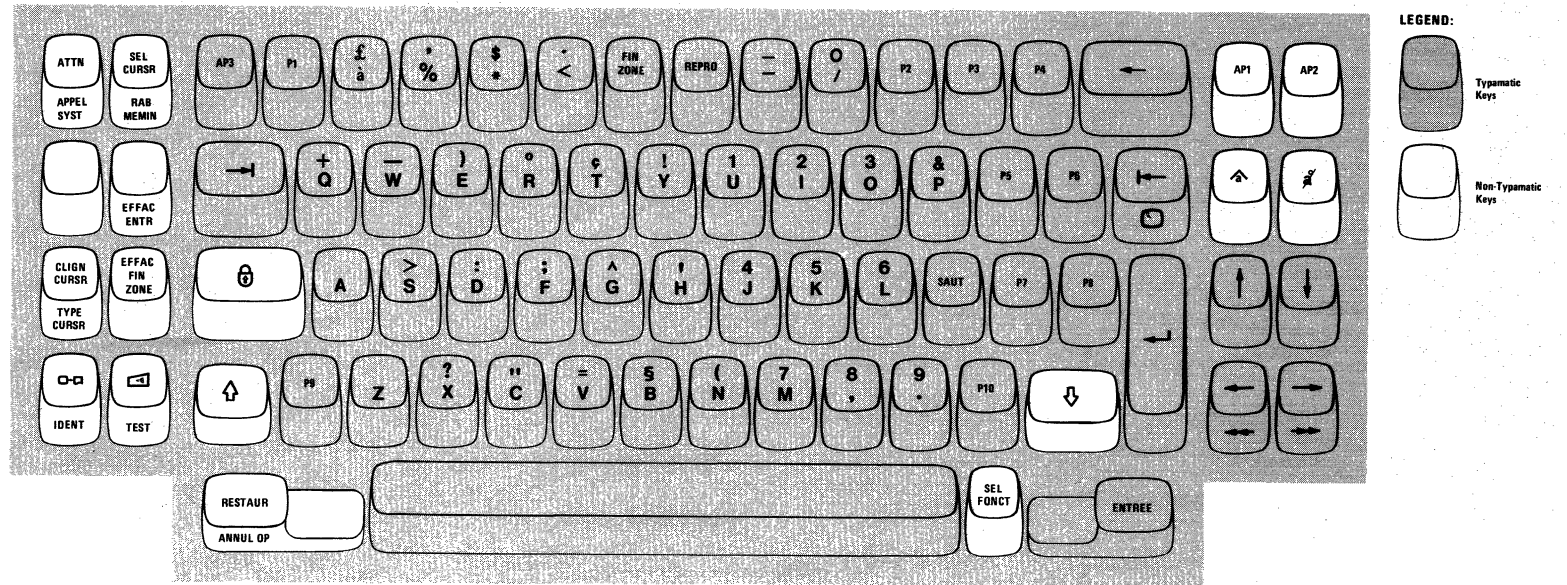


APL Keyboard

Figure 3-14 (Part 2 of 2). French (AZERTY) Keyboards



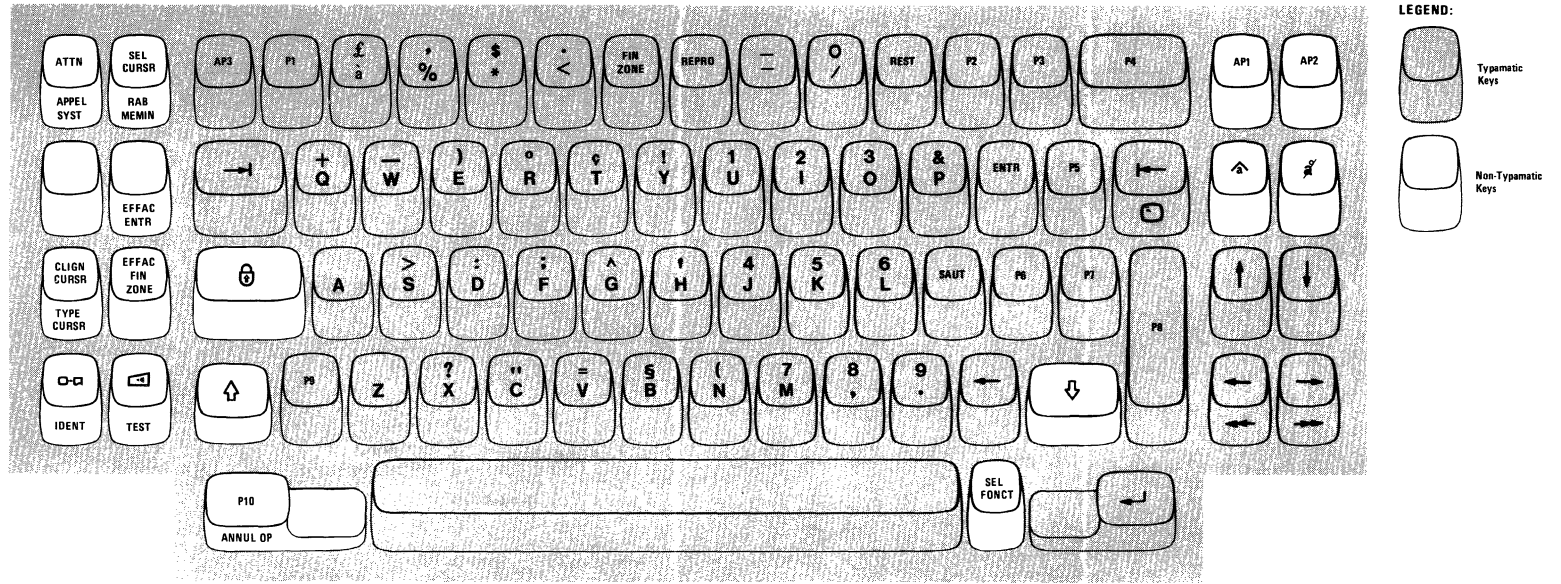
**Typewriter Keyboard**



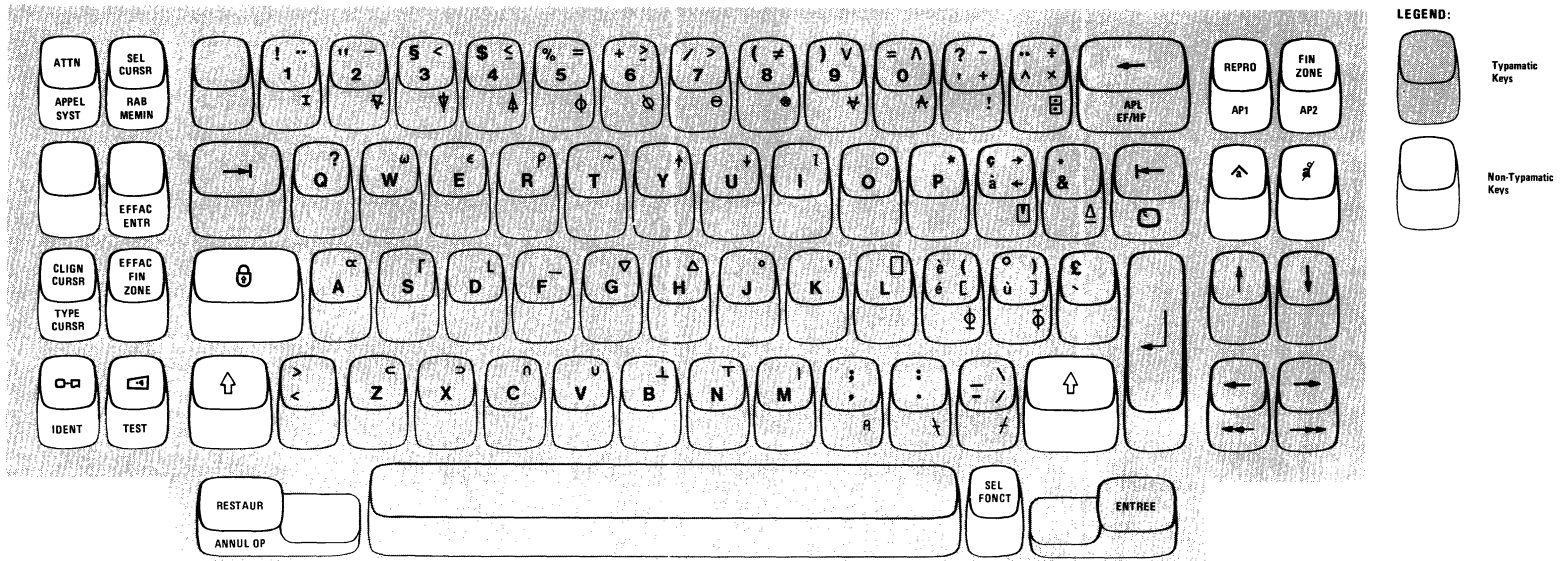
**Data Entry Keyboard**

**Figure 3-15 (Part 1 of 2). French (QWERTY) Keyboards**



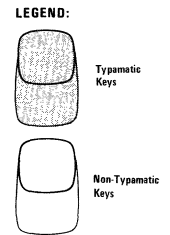
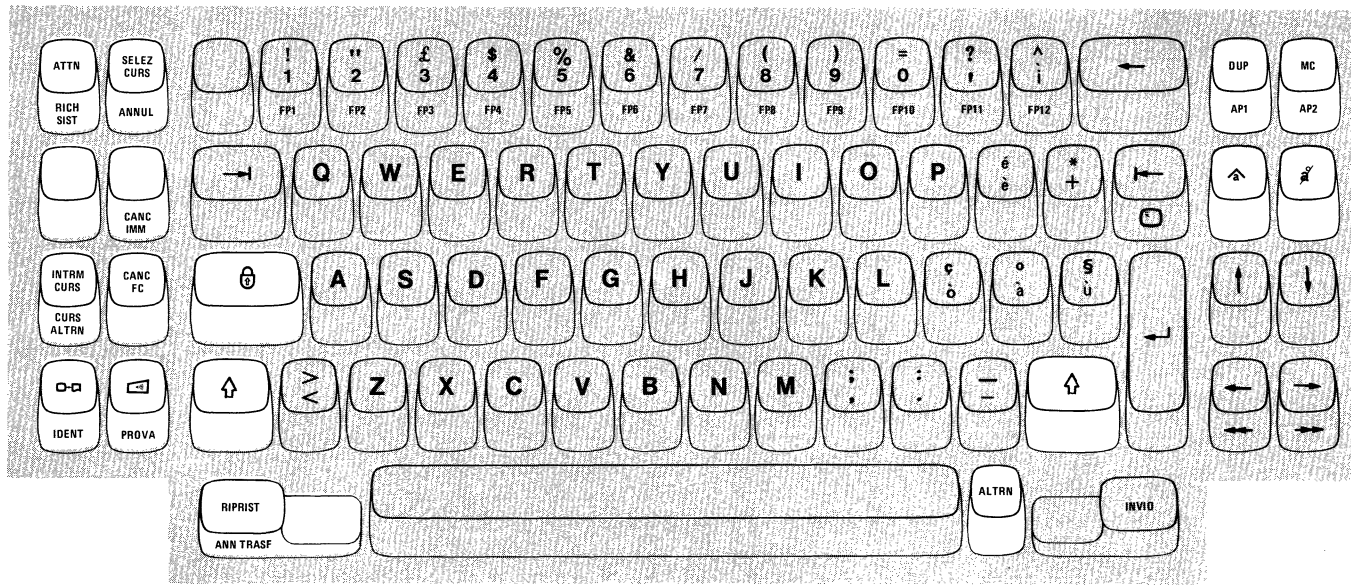


**Data Entry Keypunch Keyboard**

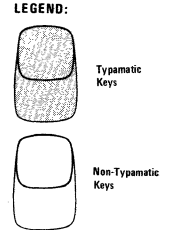
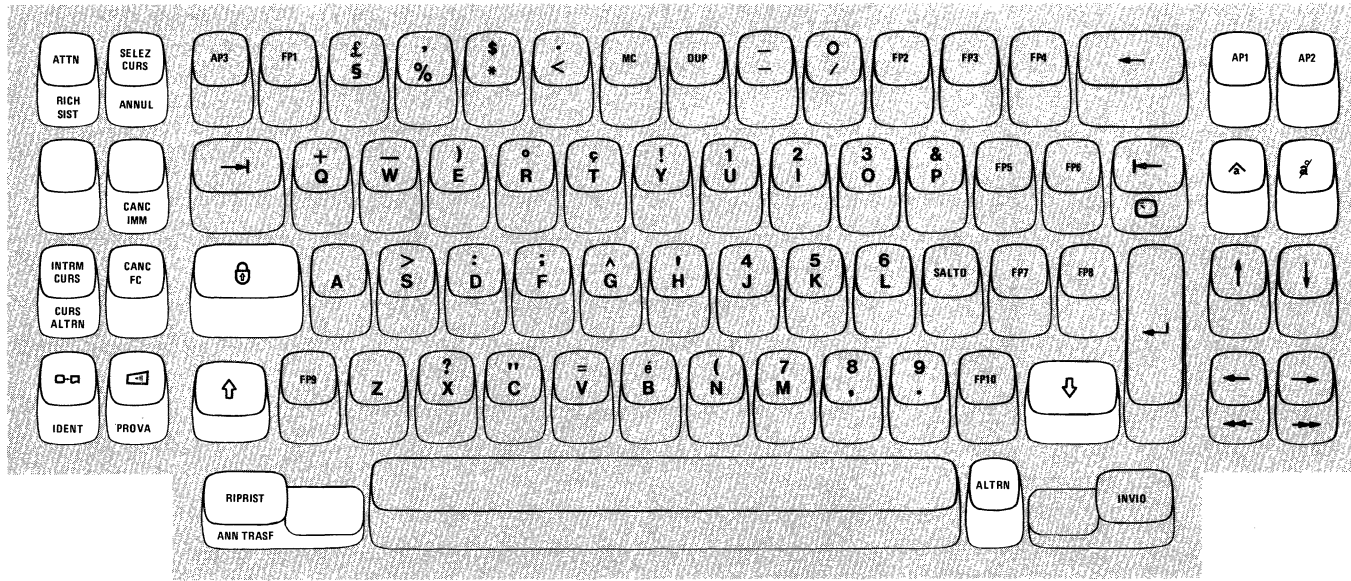


**APL Keyboard**

**Figure 3-15 (Part 2 of 2). French (QWERTY) Keyboards**

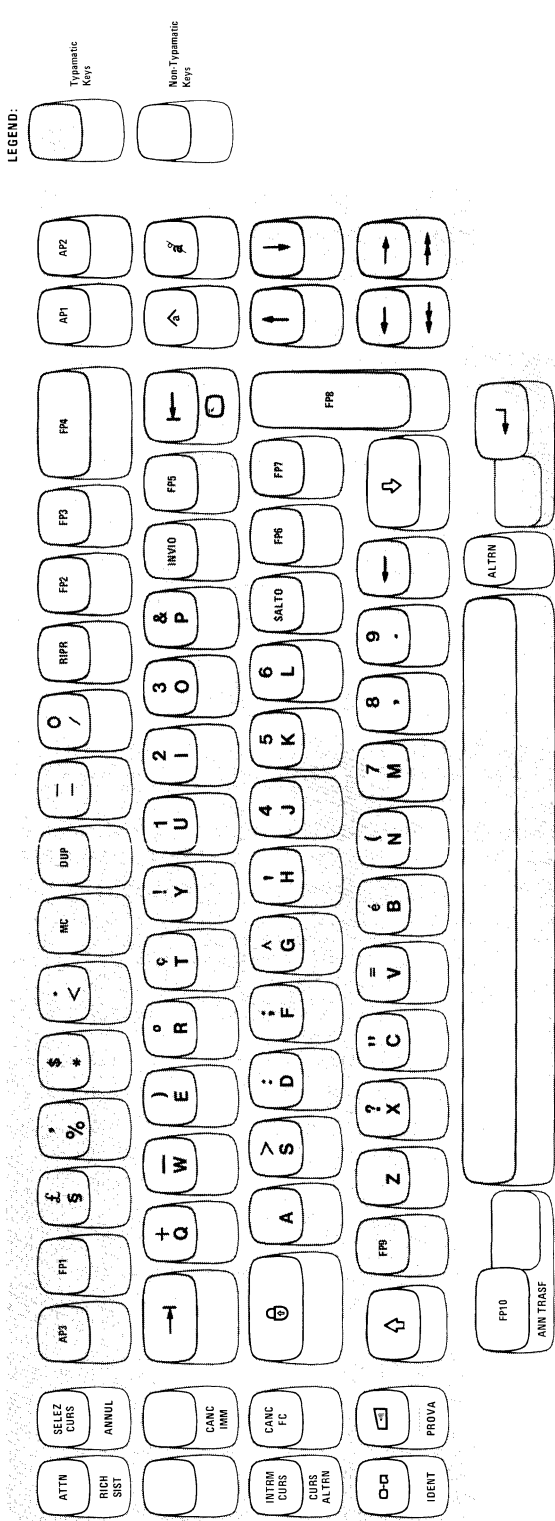


Typewriter Keyboard

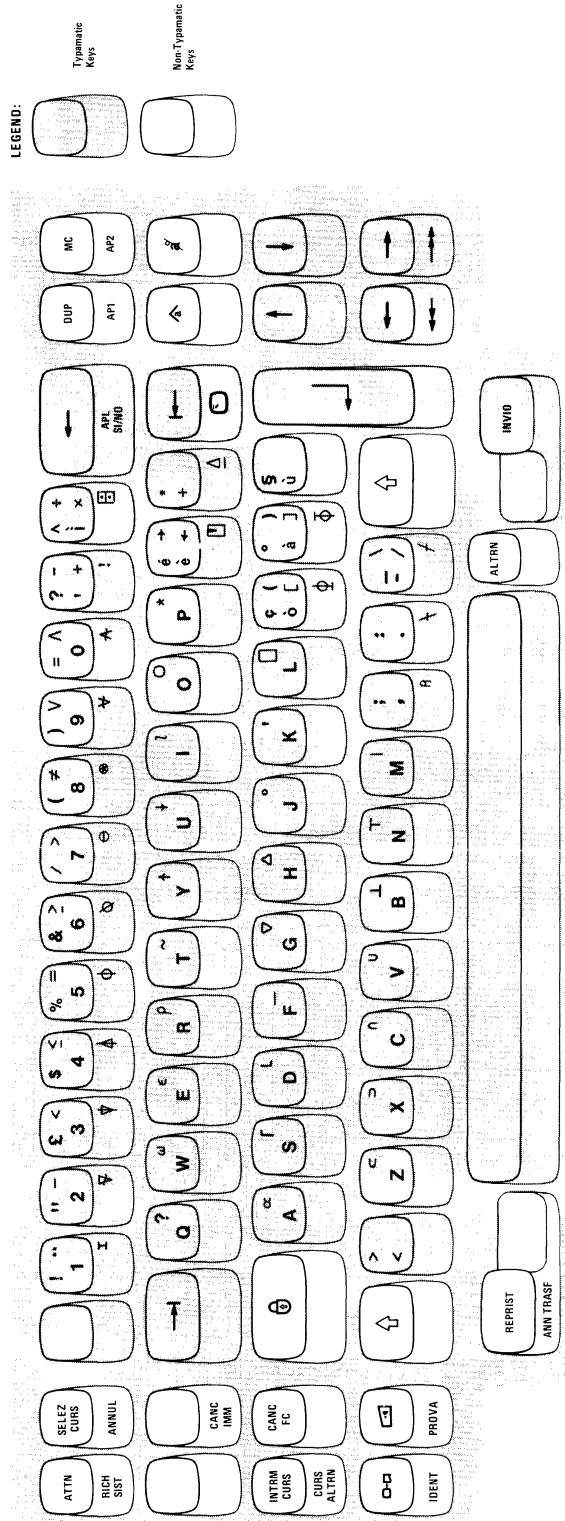


Data Entry Keyboard

Figure 3-16 (Part 1 of 2). Italian Keyboards

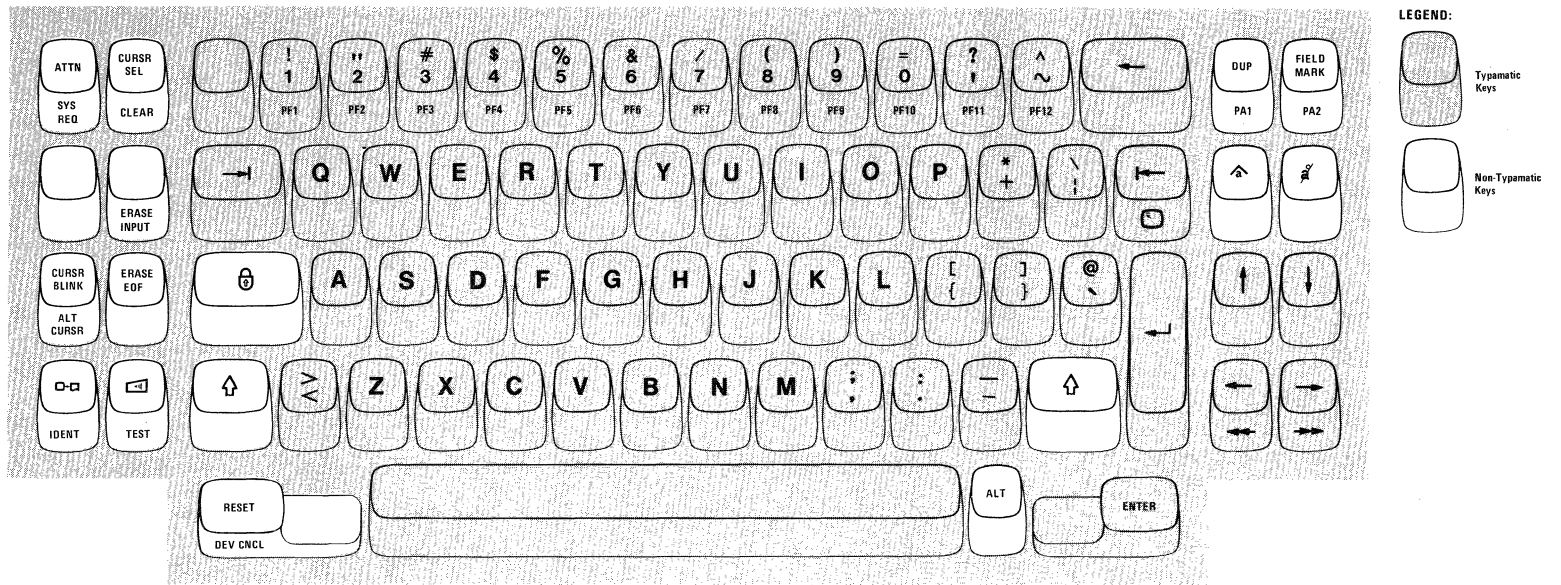


Data Entry Keypunch Keyboard

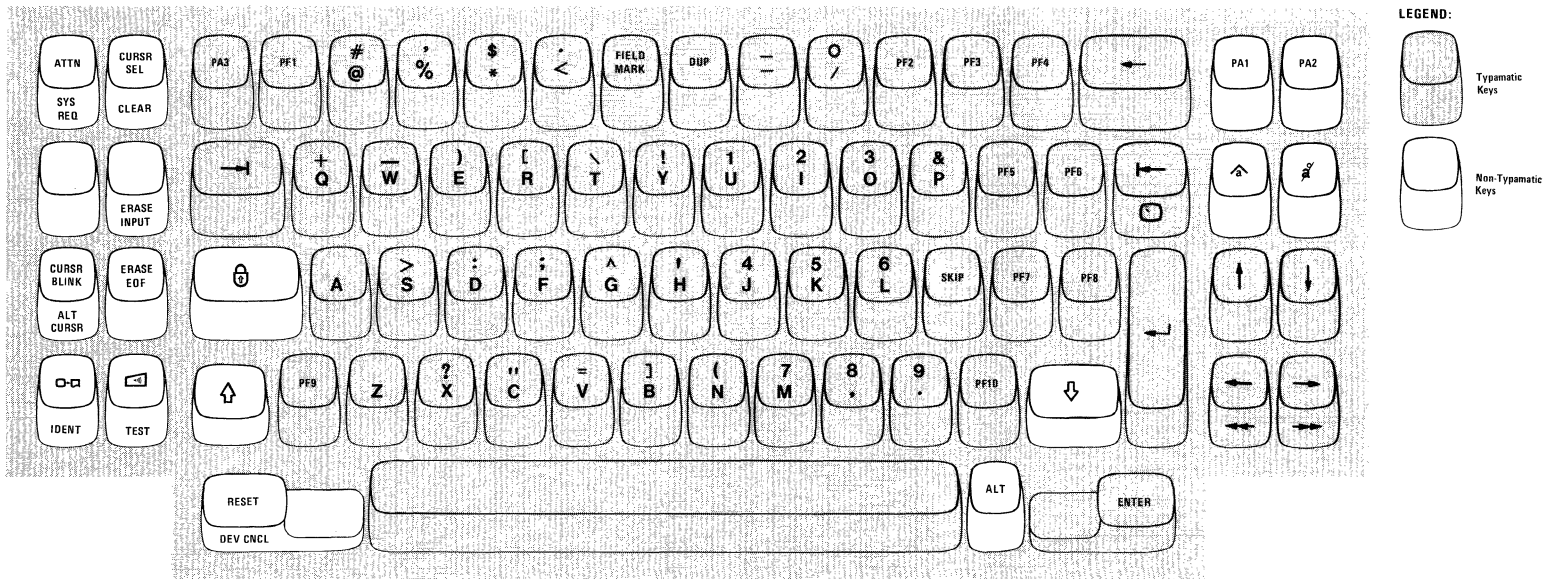


APL Keyboard

Figure 3-16 (Part 2 of 2). Italian Keyboards



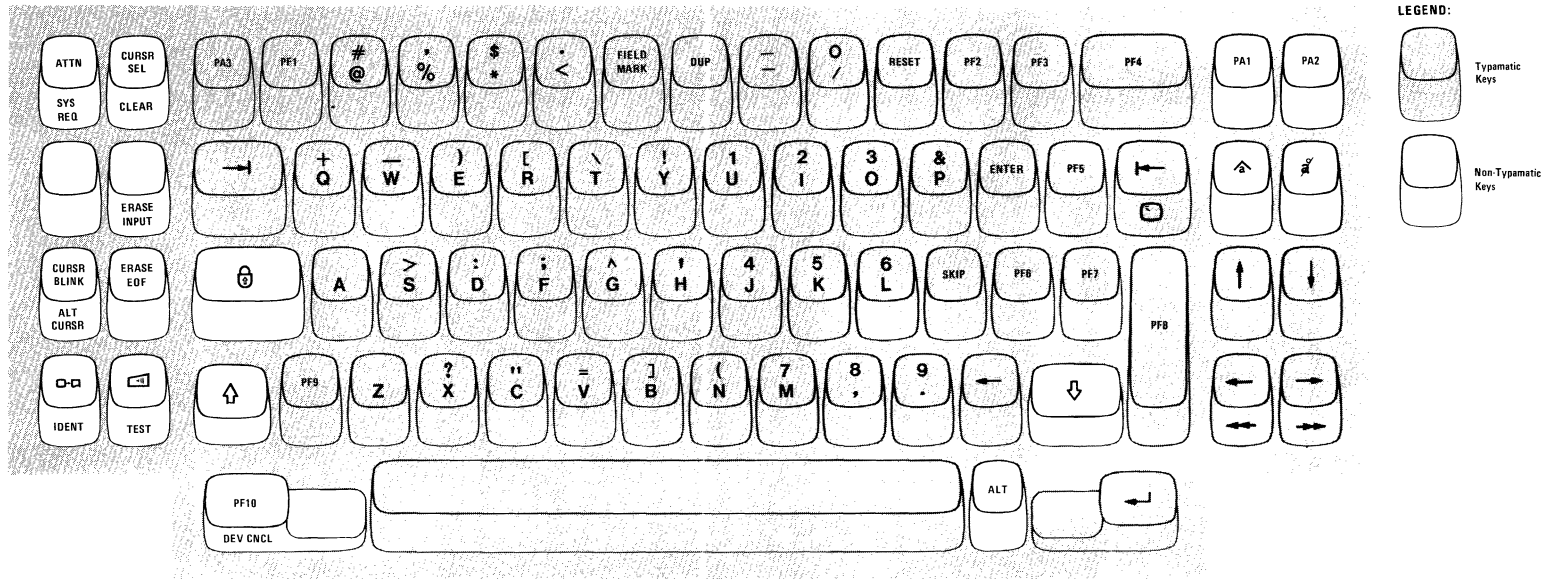
Typewriter Keyboard



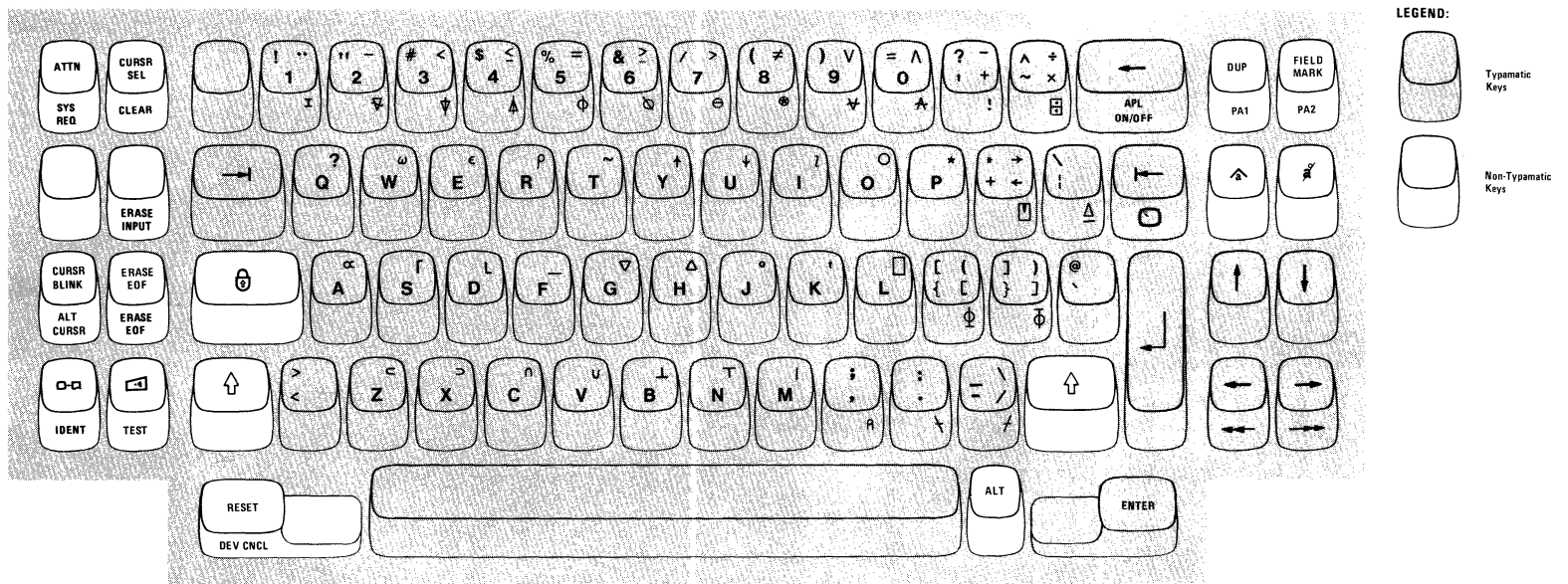
Data Entry Keyboard

Figure 3-17 (Part 1 of 2). International Keyboards



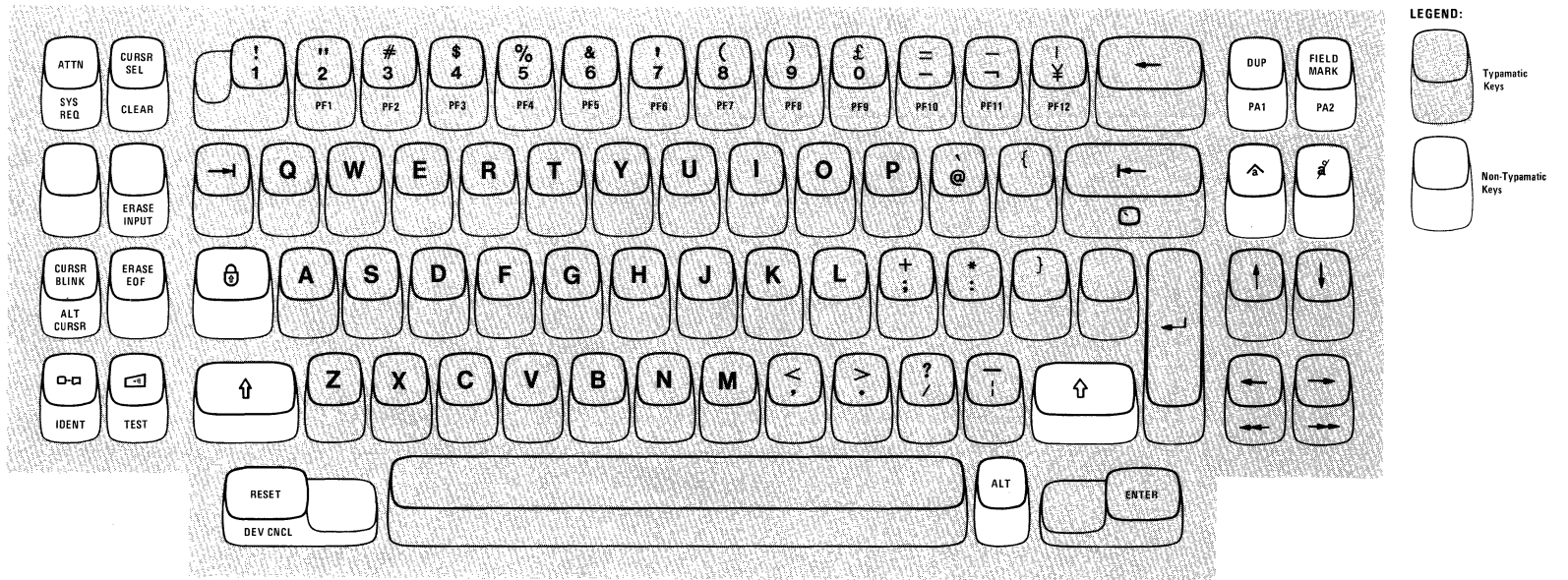


Data Entry Keypunch Keyboard

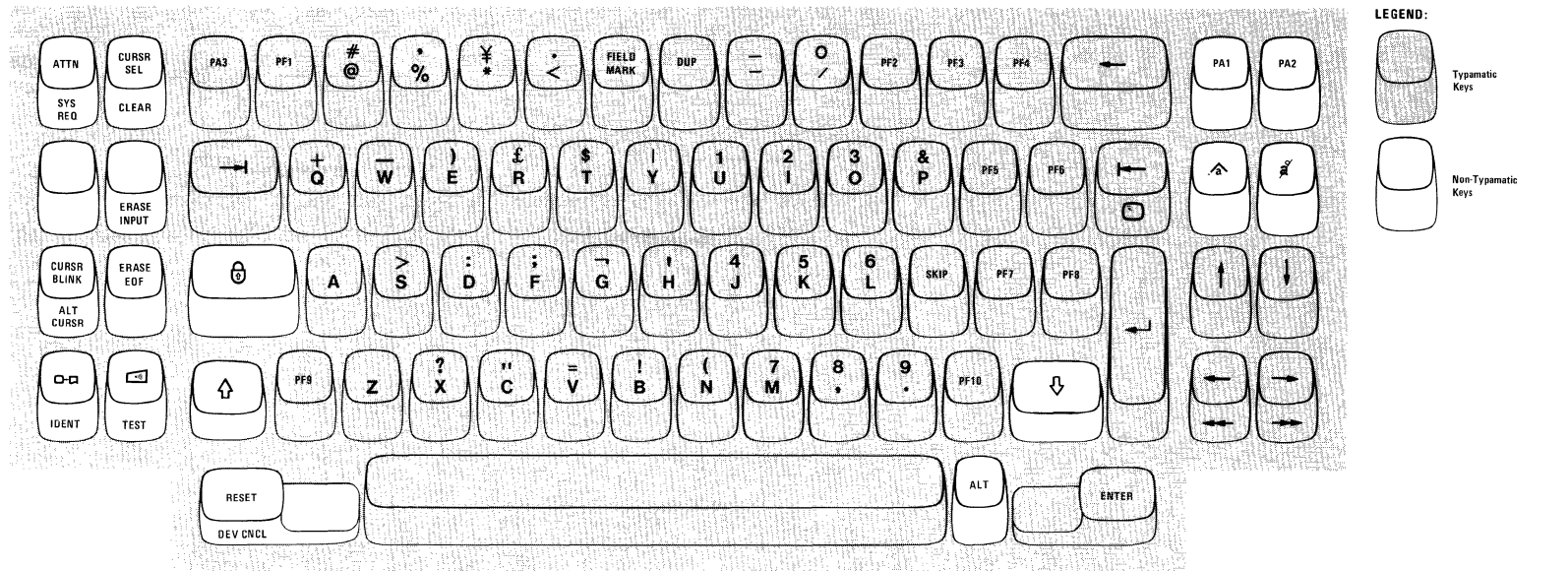


APL Keyboard

Figure 3-17 (Part 2 of 2). International Keyboards

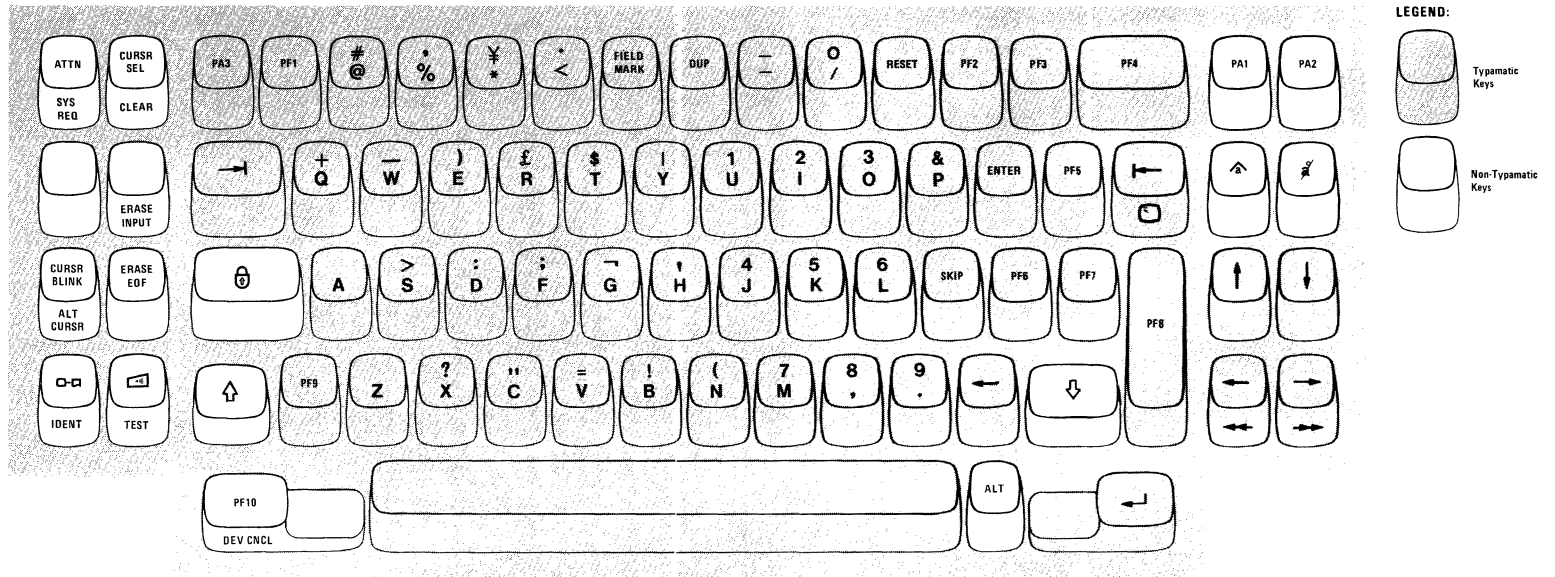


Typewriter Keyboard

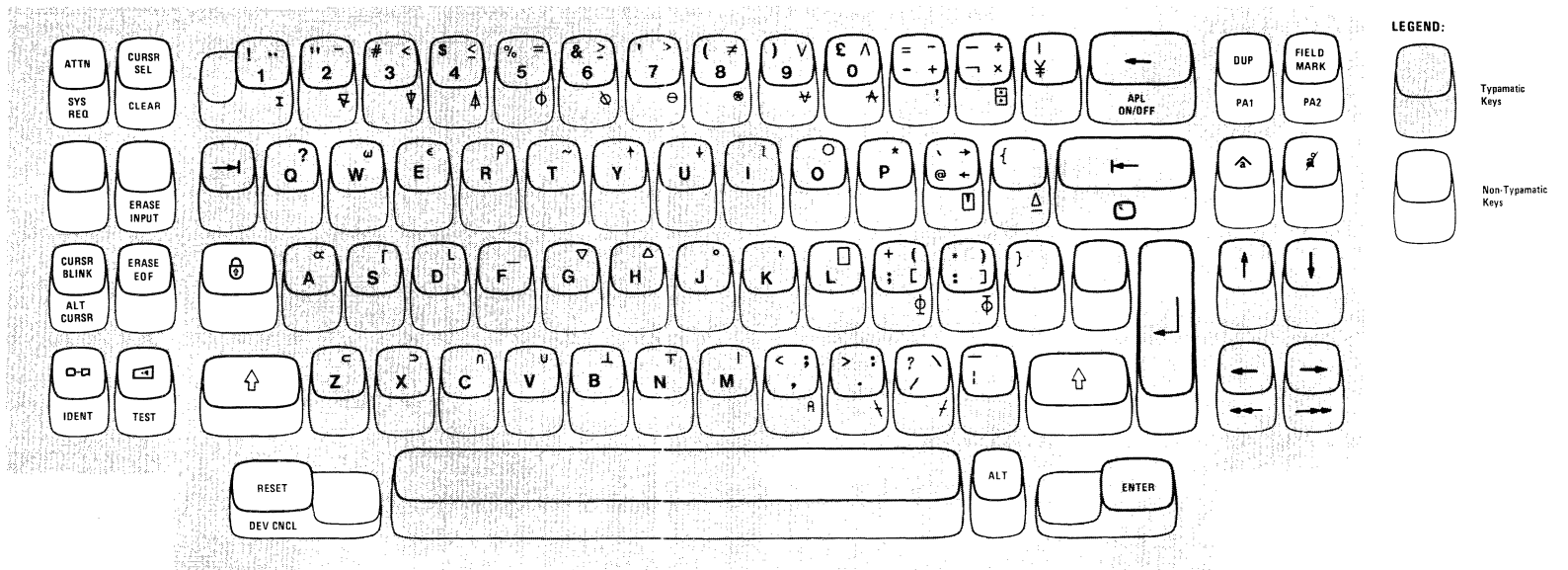


Data Entry Keyboard

Figure 3-18 (Part 1 of 2). Japanese (English) Keyboards

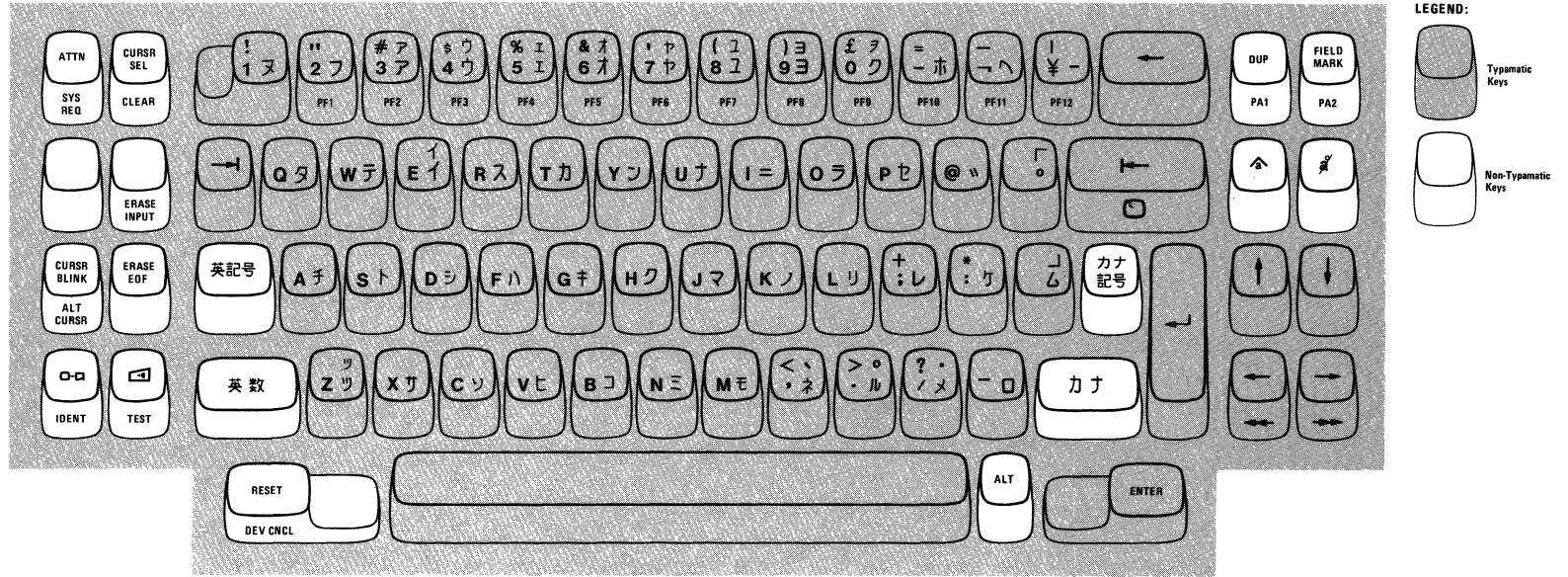


Data Entry Keypunch Keyboard

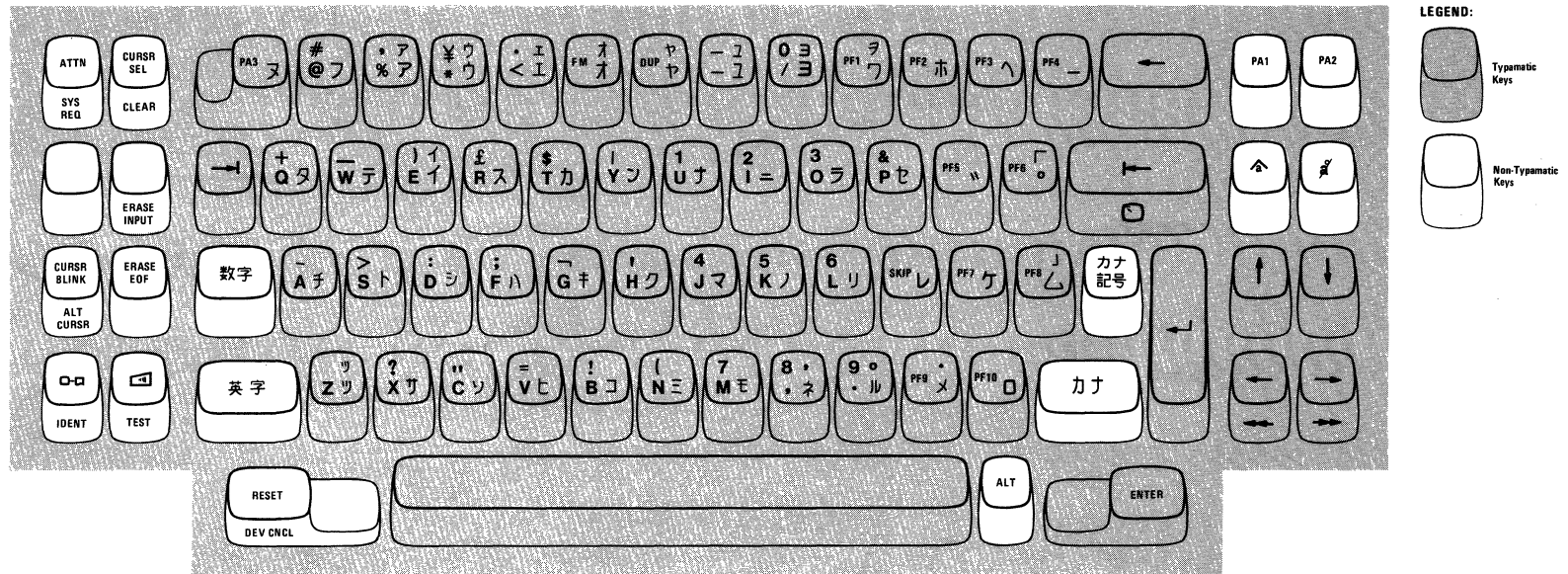


APL Keyboard

Figure 3-18 (Part 2 of 2). Japanese (English) Keyboards



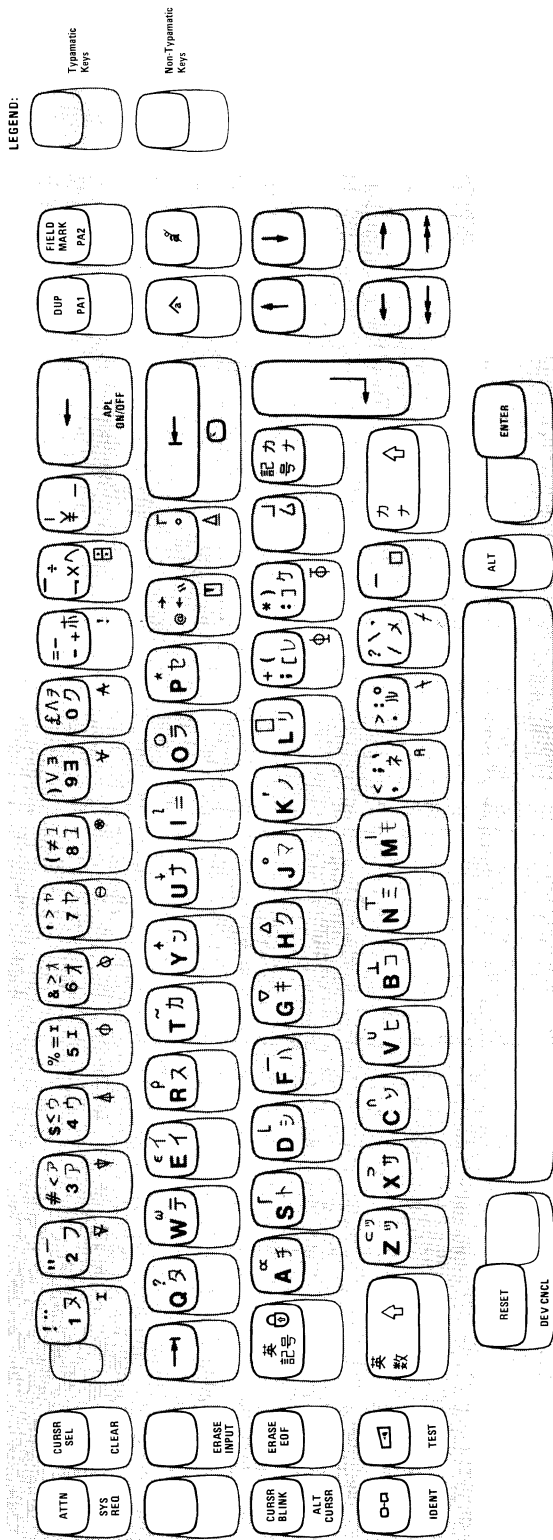
Typewriter Keyboard

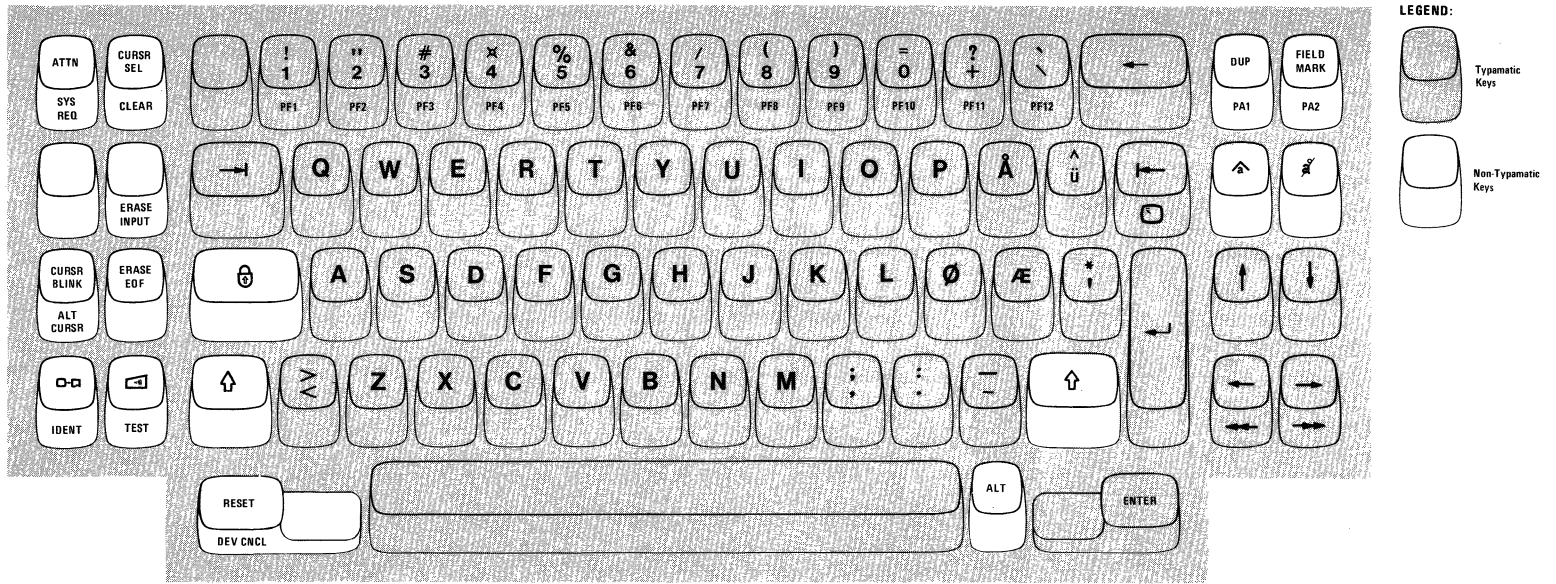


Data Entry Keyboard

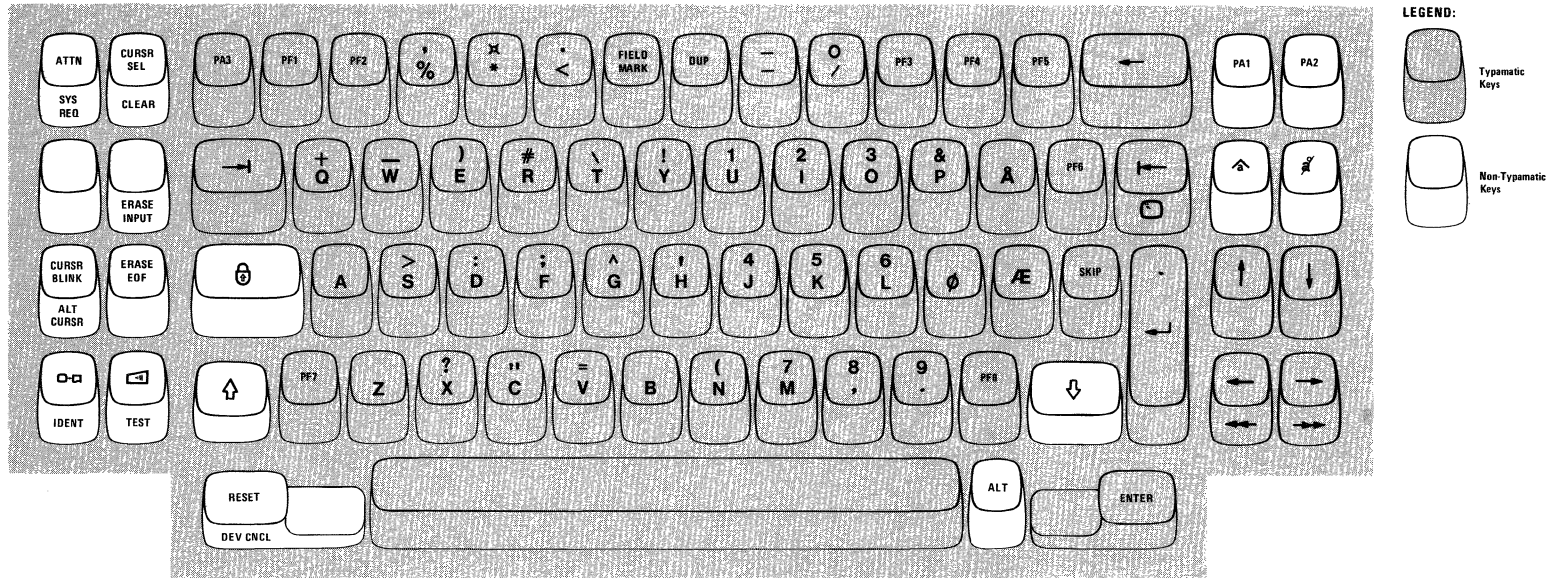
Figure 3-19 (Part 1 of 2). Japanese (Katakana) Keyboards





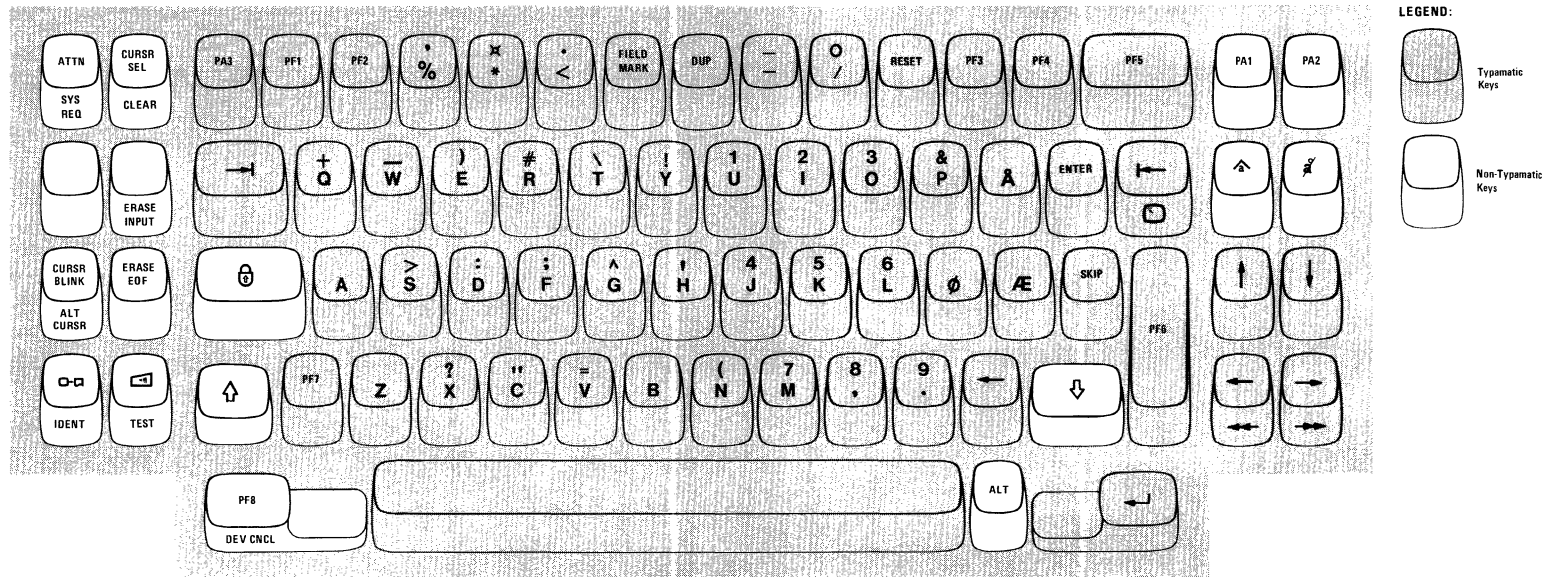


Typewriter Keyboard

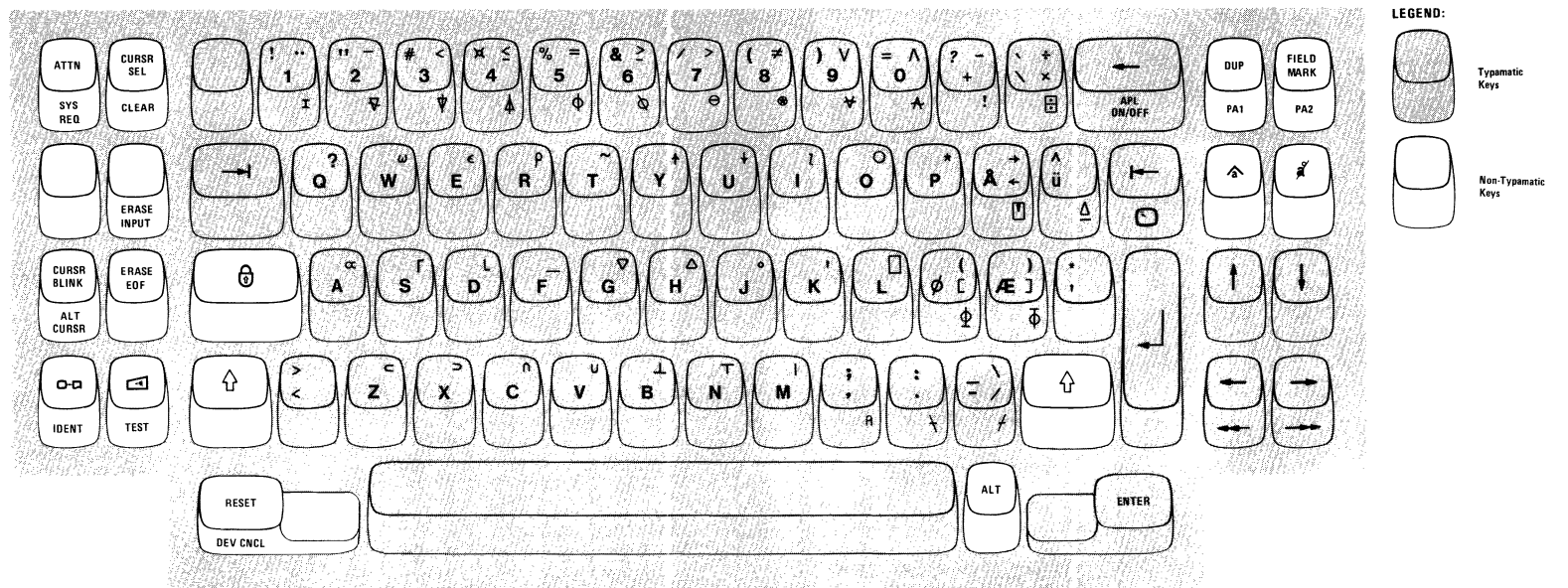


Data Entry Keyboard

Figure 3-20 (Part 1 of 2). Norwegian Keyboards

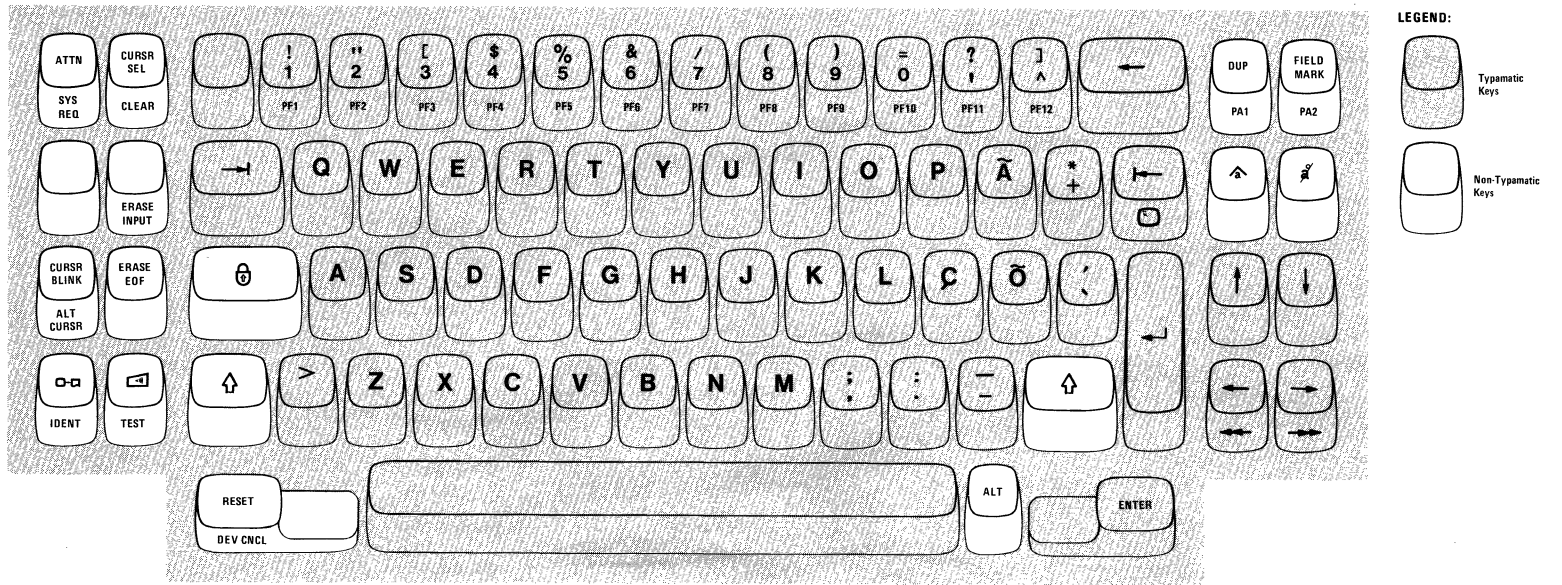


Data Entry Keypunch Keyboard

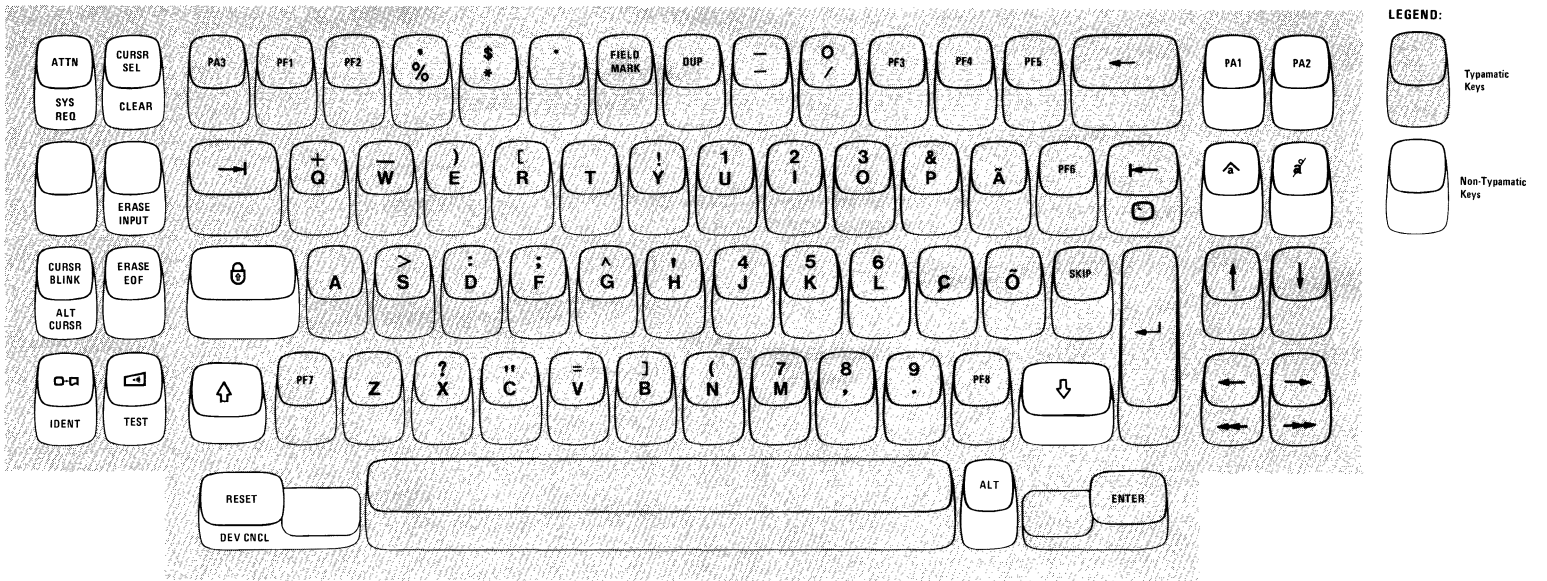


APL Keyboard

Figure 3-20 (Part 2 of 2). Norwegian Keyboards



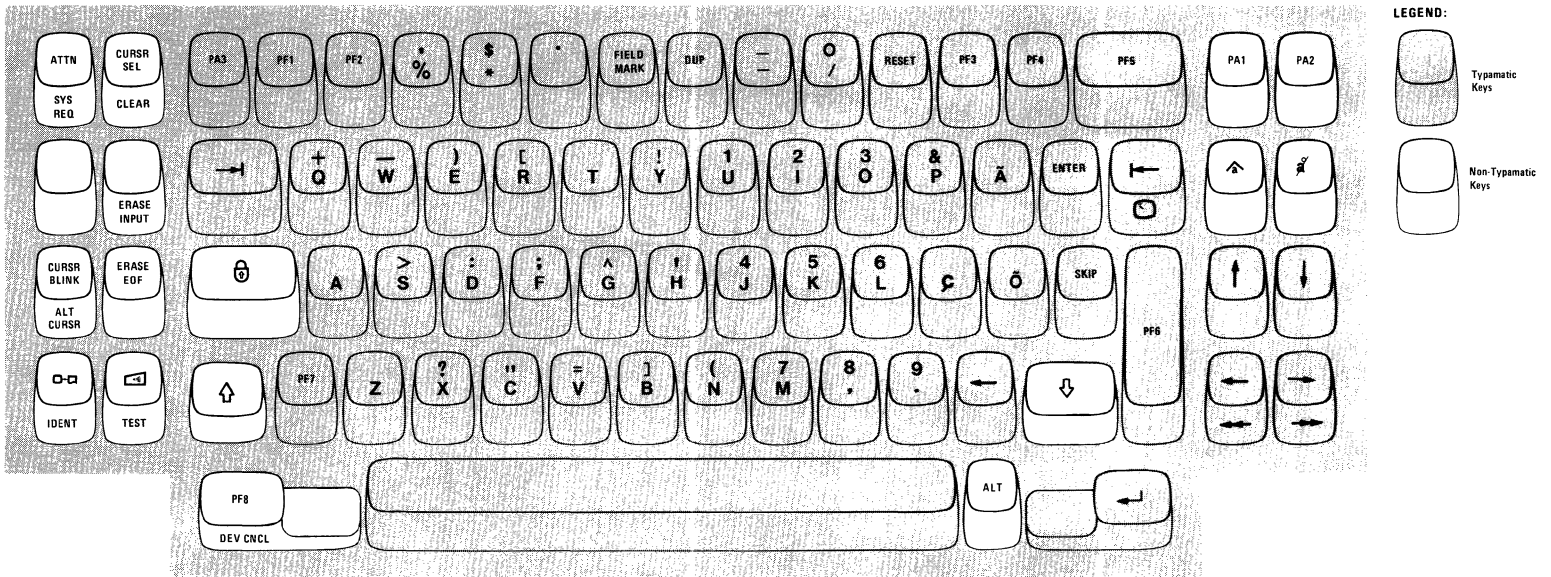
Typewriter Keyboard



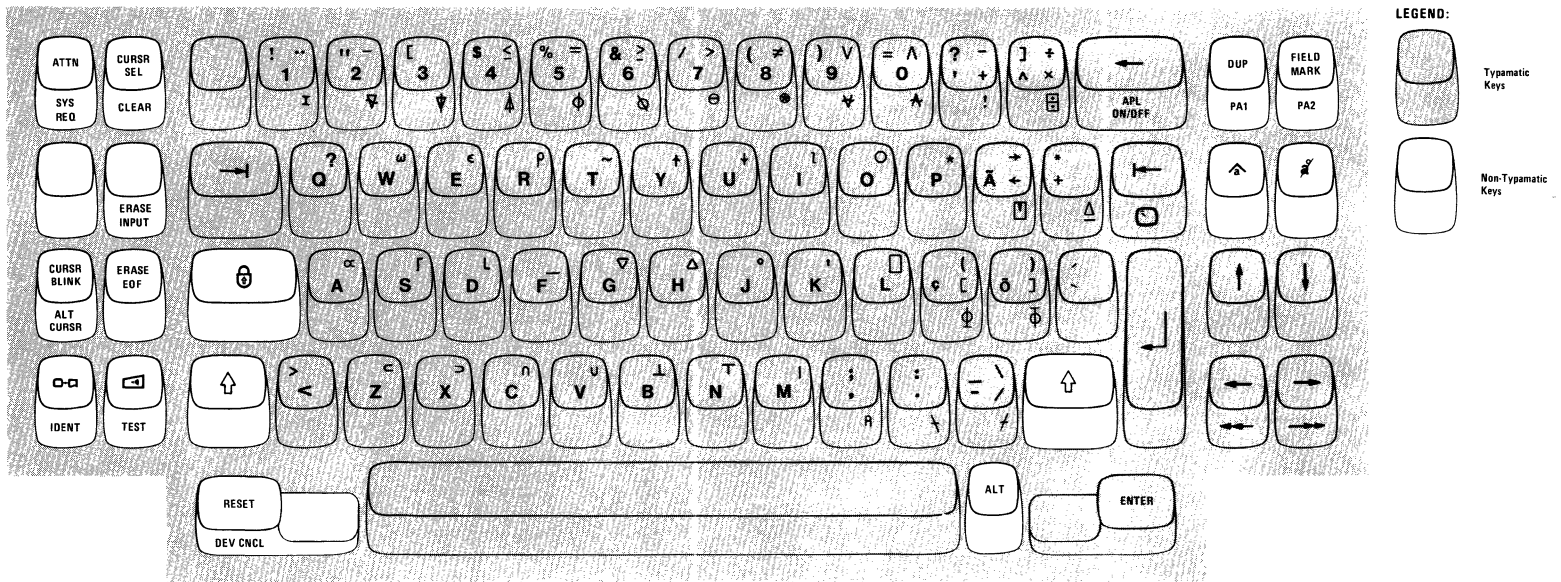
Data Entry Keyboard

Figure 3-21 (Part 1 of 2). Portuguese Keyboards



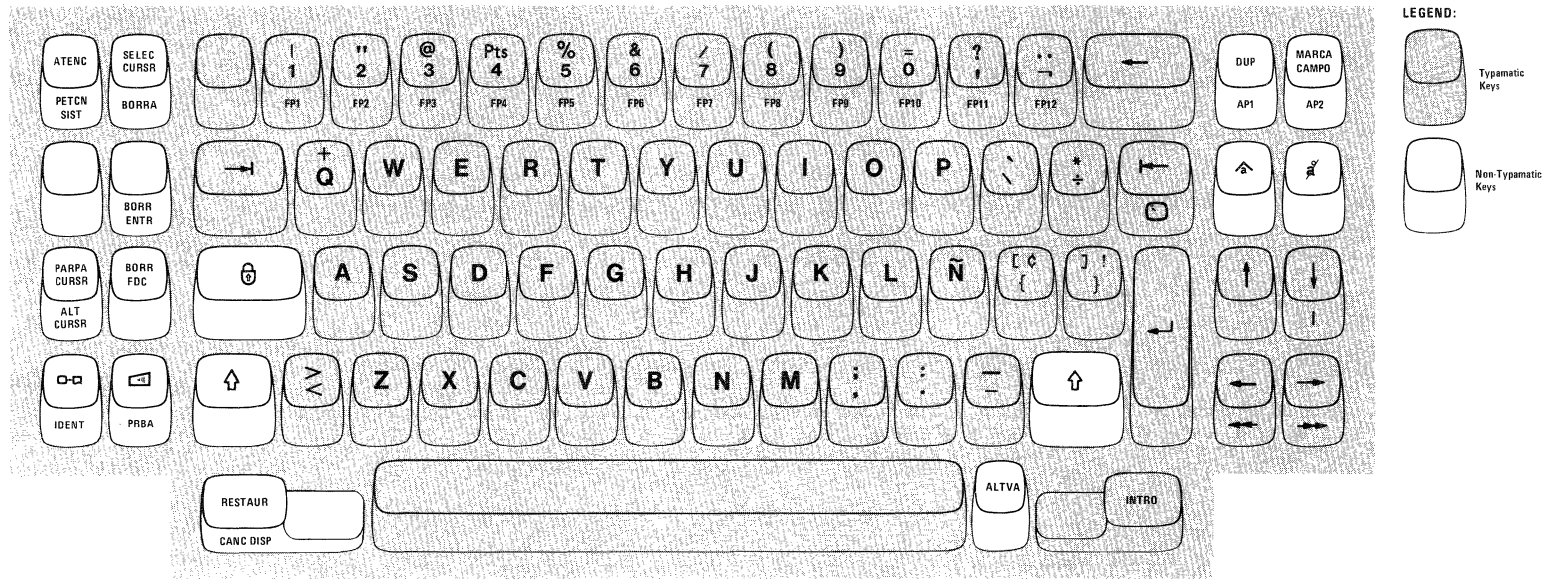


Data Entry Keypunch Keyboard

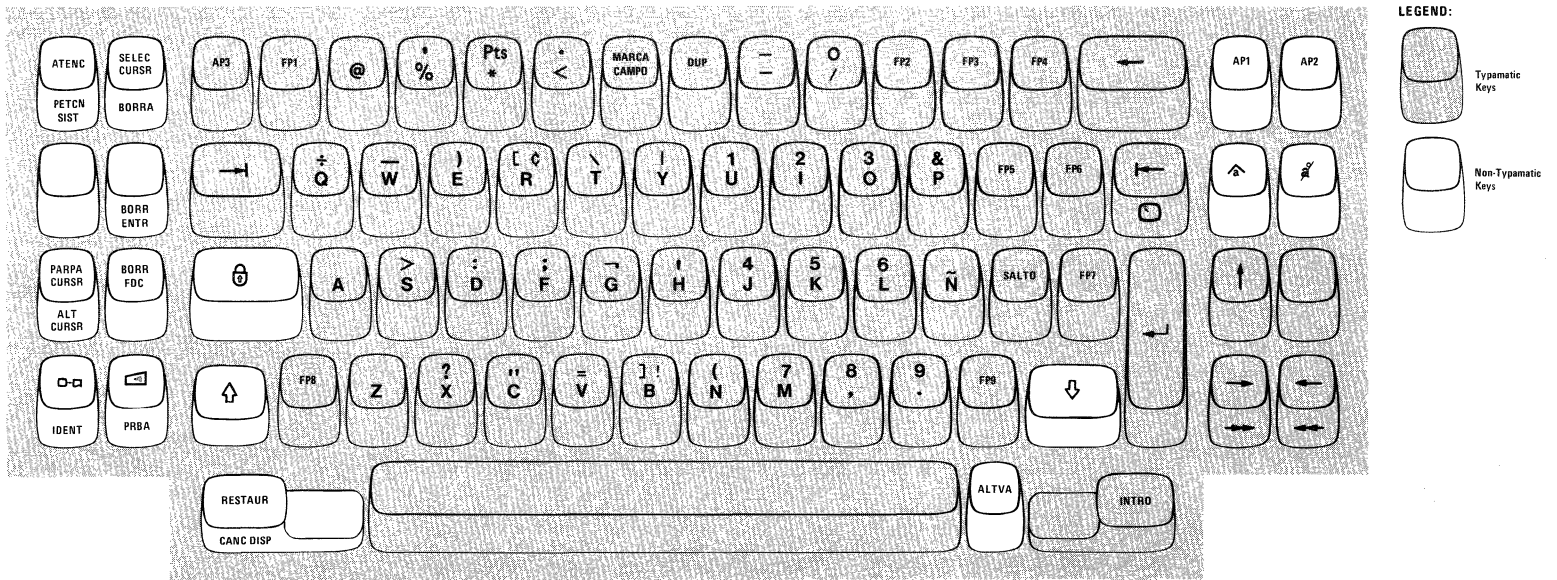


APL Keyboard

Figure 3-21 (Part 2 of 2). Portuguese Keyboards



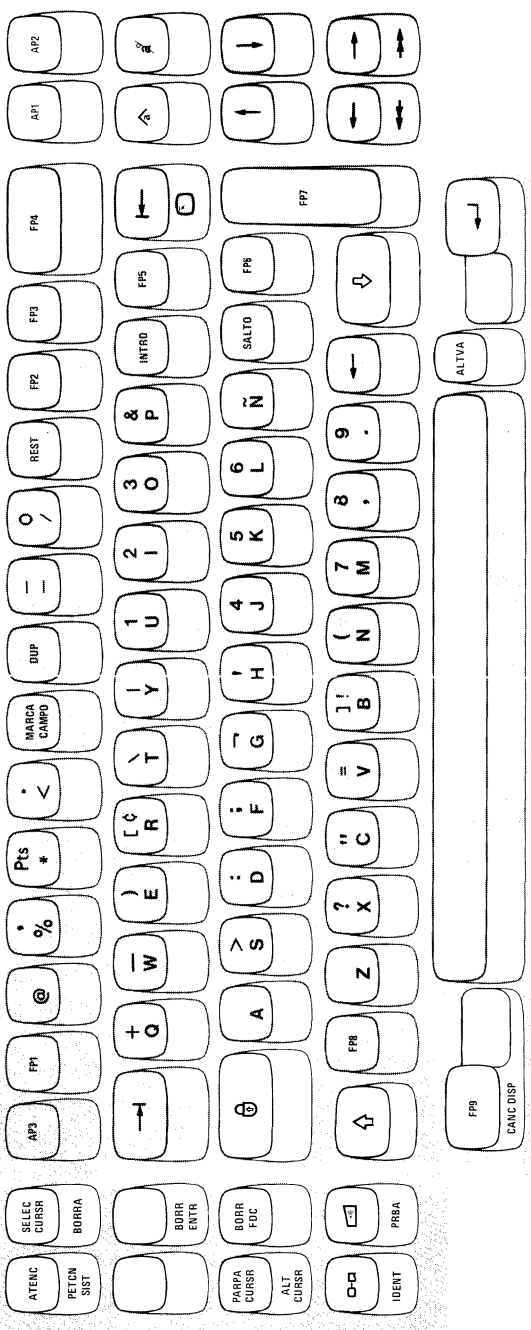
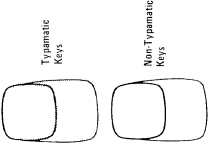
Typewriter Keyboard



Data Entry Keyboard

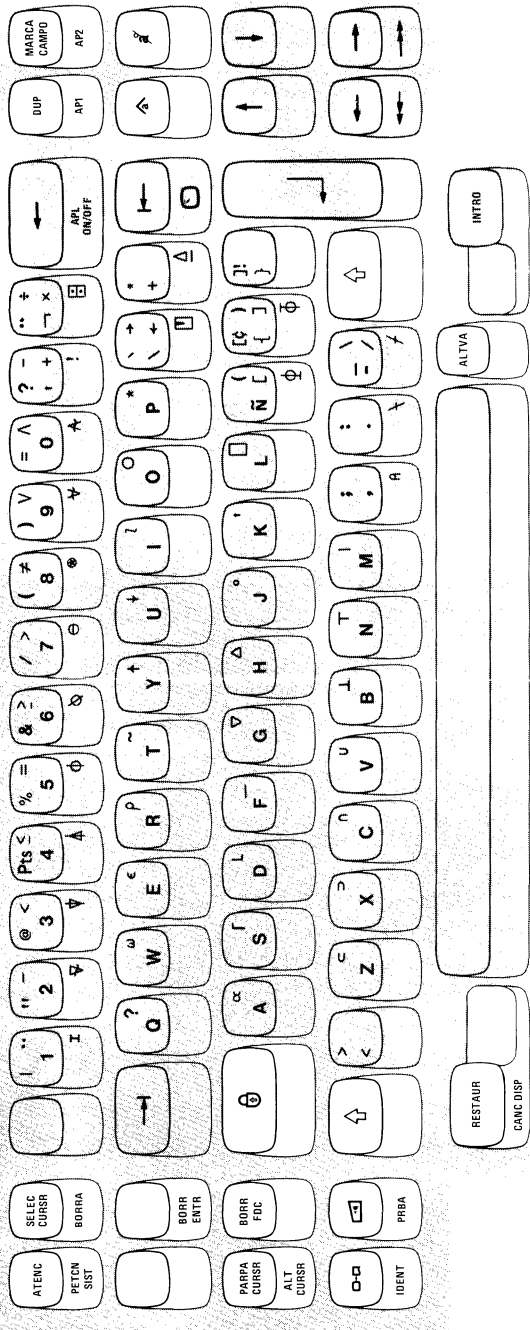
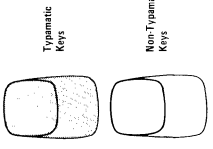
Figure 3-22 (Part 1 of 2). Spanish Keyboards

LEGEND:



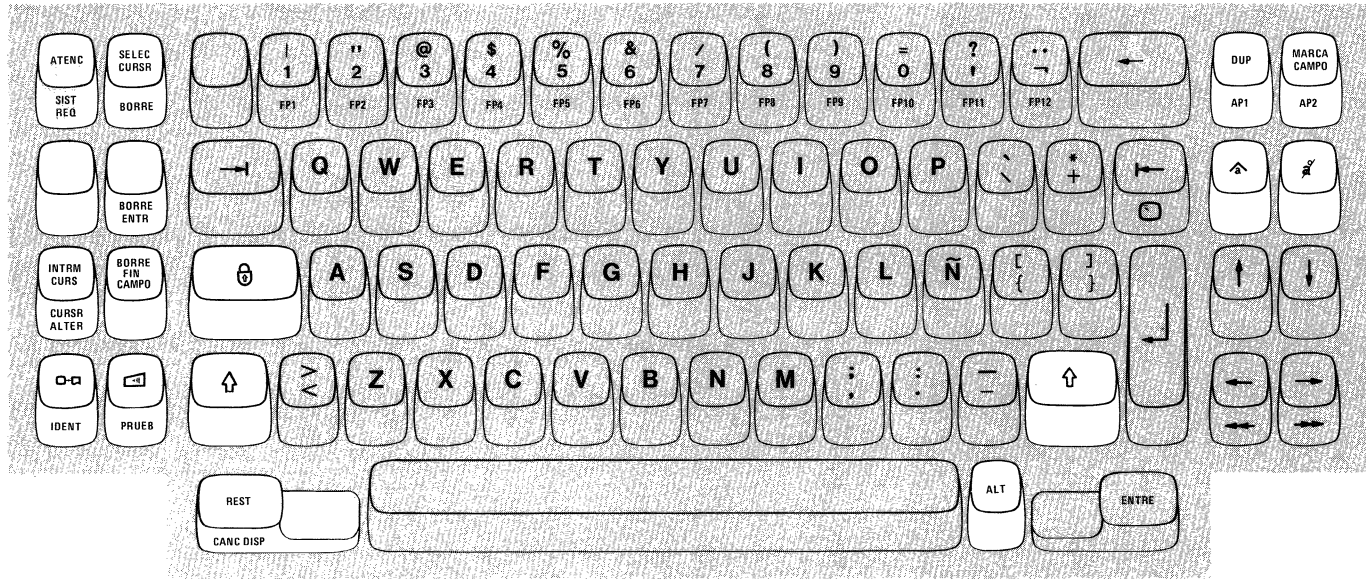
Data Entry Keypunch Keyboard

LEGEND:

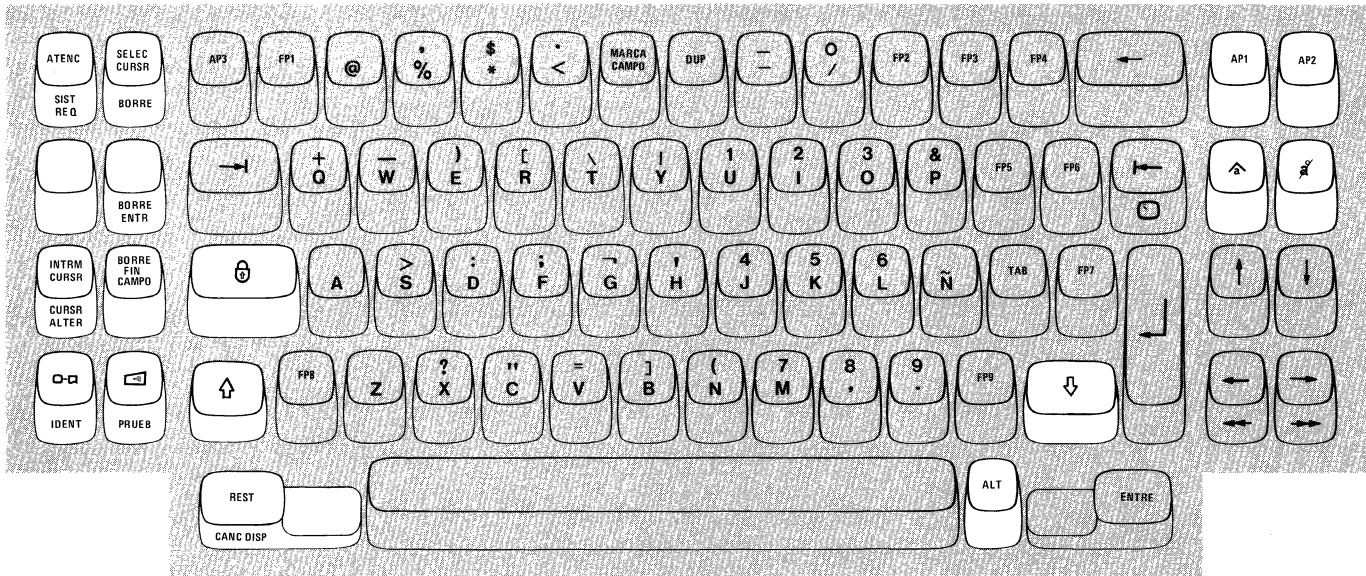


APL Keyboard

Figure 3-22 (Part 2 of 2). Spanish Keyboards



Typewriter Keyboard

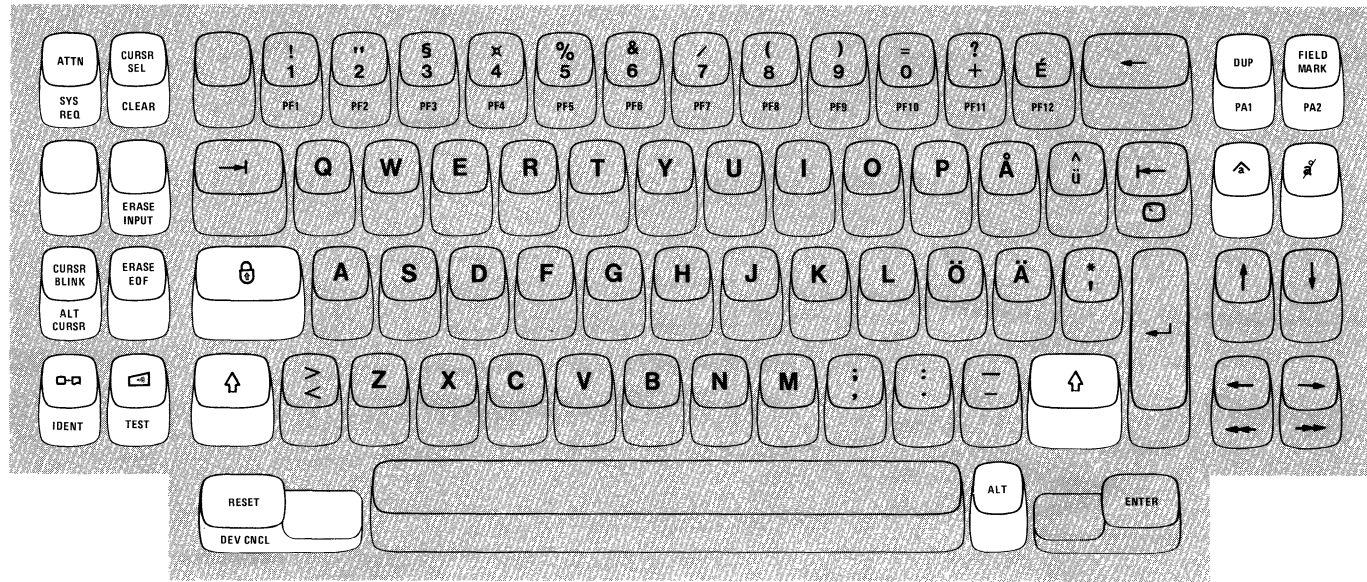


Data Entry Keyboard

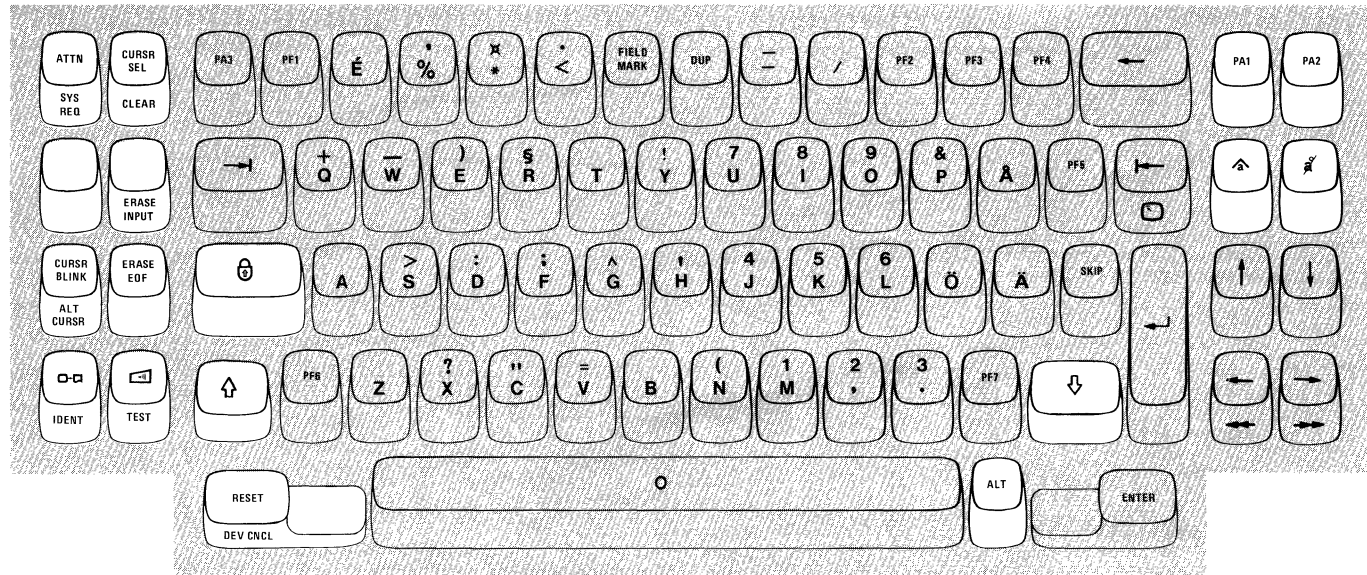
Figure 3-23 (Part 1 of 2). Spanish-Speaking Keyboards





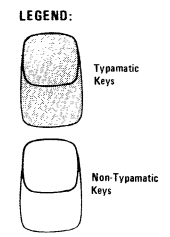
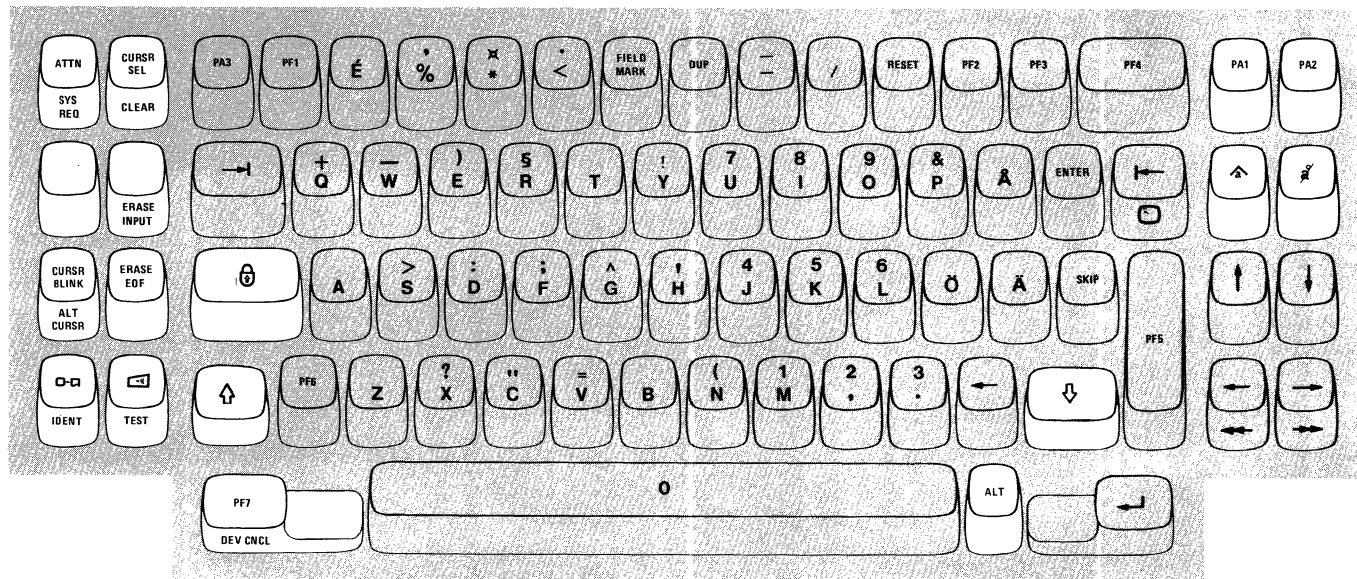


Typewriter Keyboard

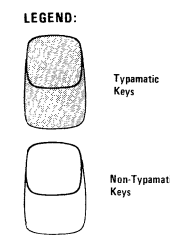
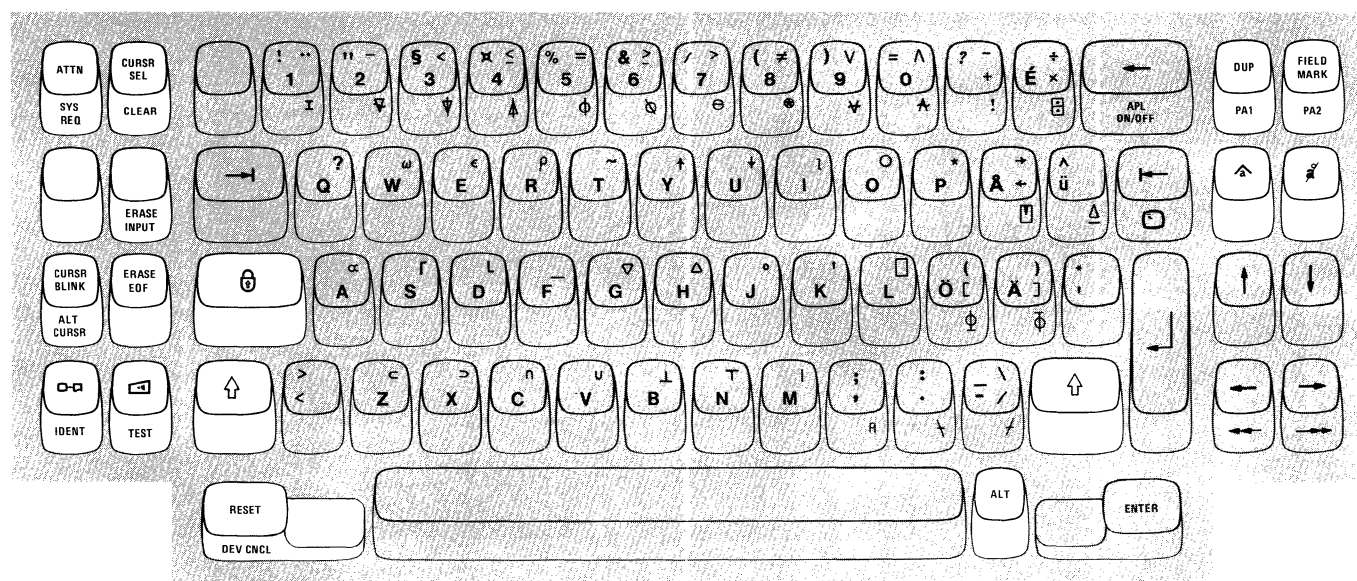


Data Entry Keyboard

Figure 3-24 (Part 1 of 2). Swedish Keyboards



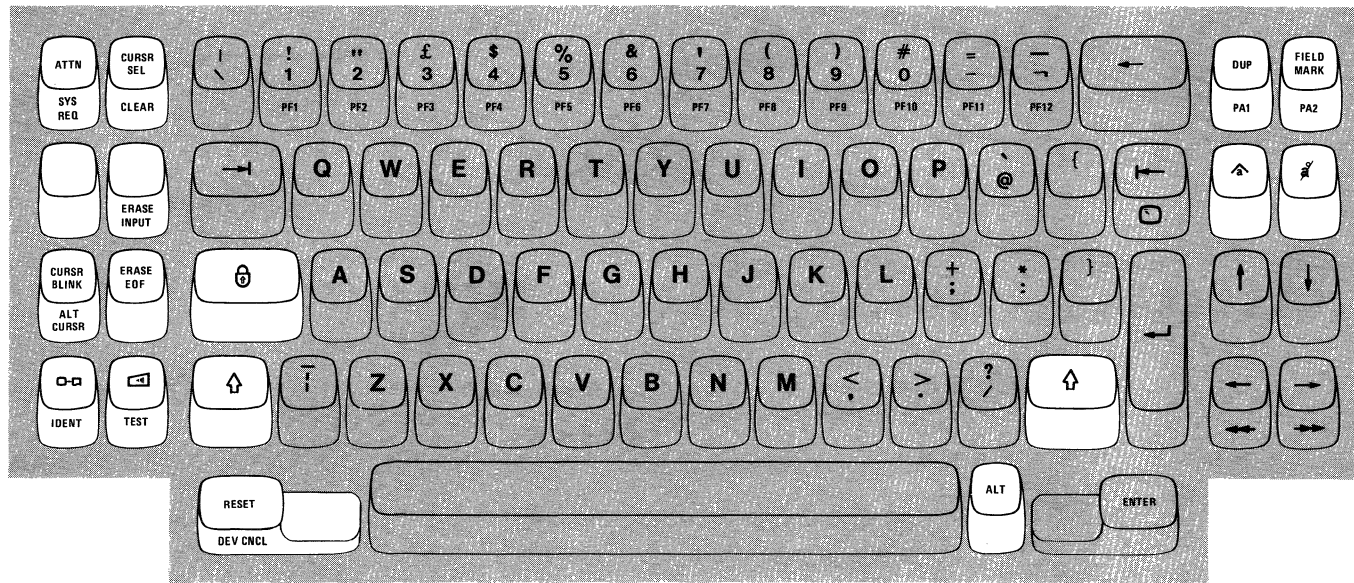
Data Entry Keypunch Keyboard



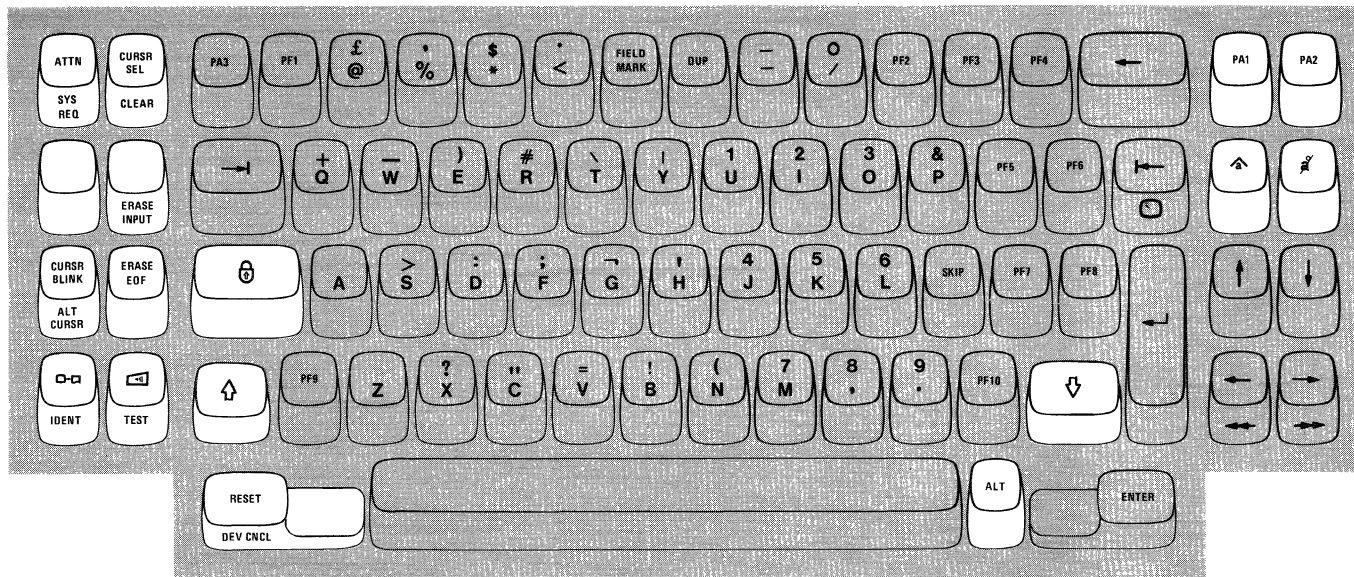
APL Keyboard

Figure 3-24 (Part 2 of 2). Swedish Keyboards



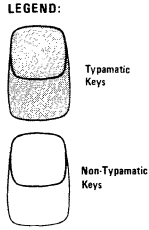
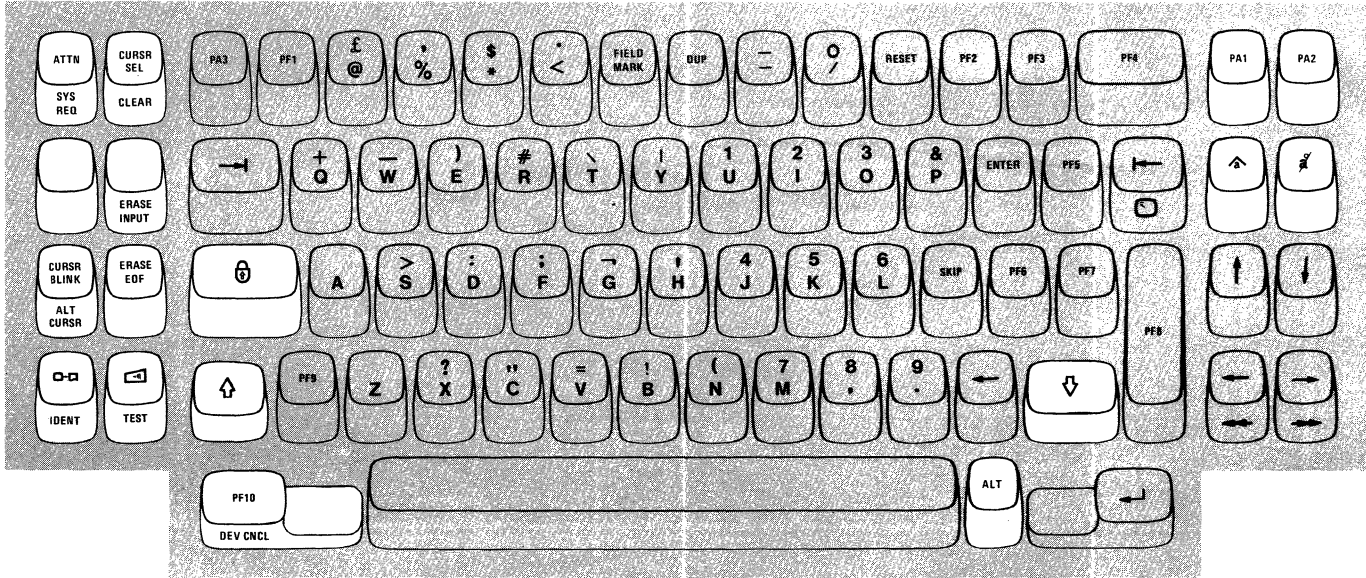


Typewriter Keyboard

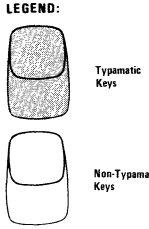
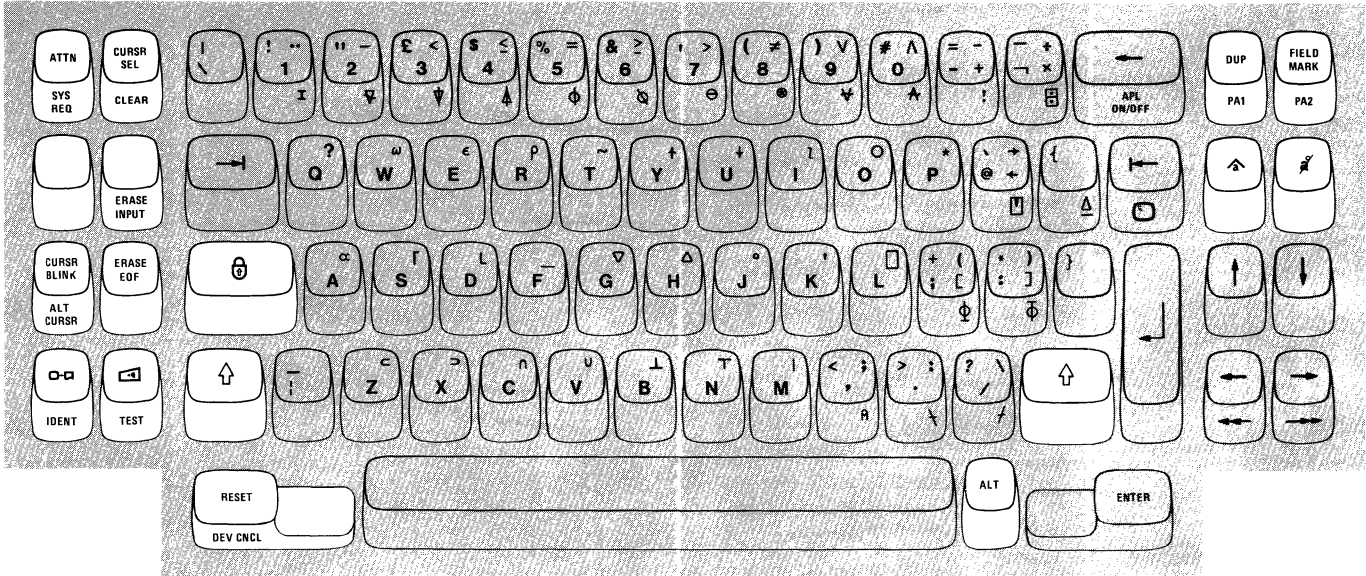


Data Entry Keyboard

Figure 3-25 (Part 1 of 2). English (UK) Keyboards



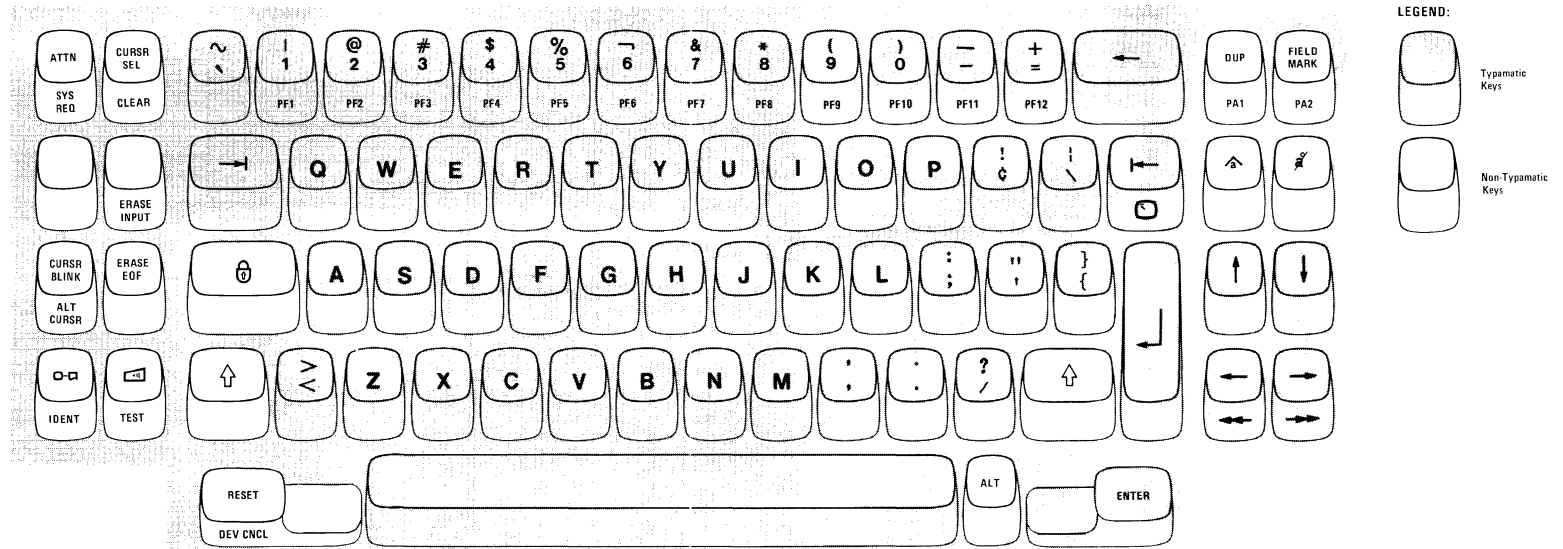
**Data Entry Keypunch Keyboard**



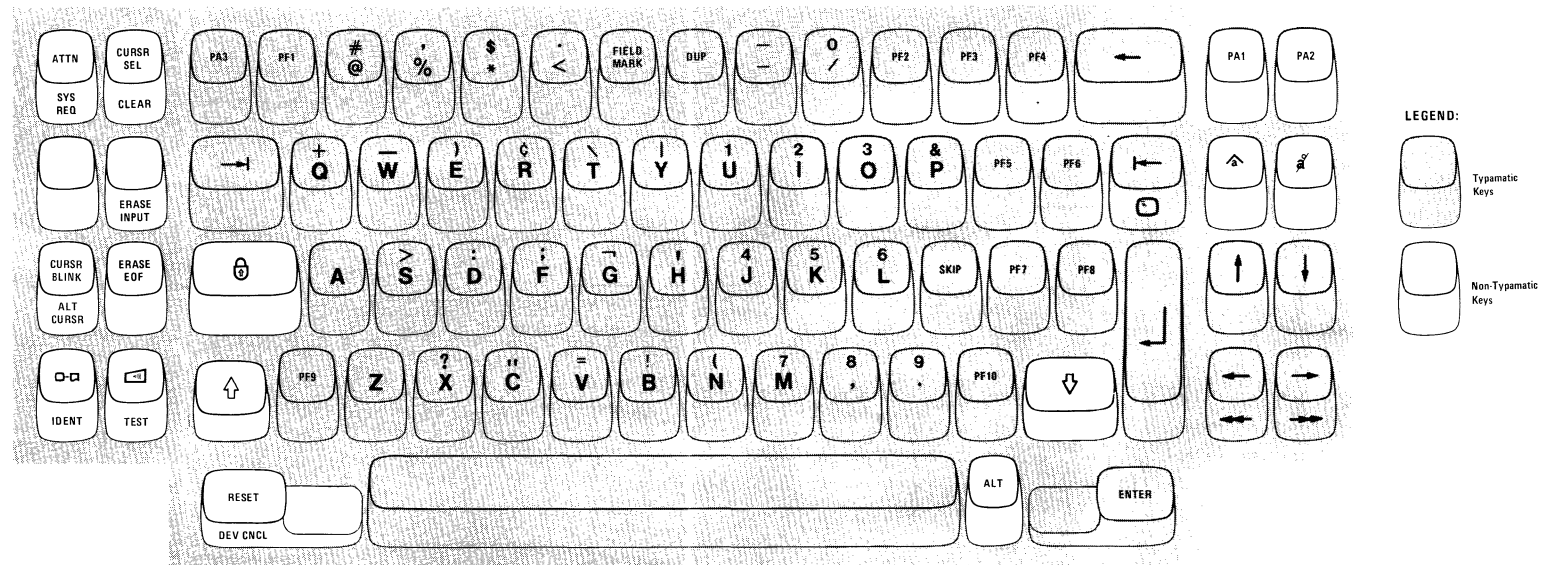
**APL Keyboard**

**Figure 3-25 (Part 2 of 2). English (UK) Keyboards**





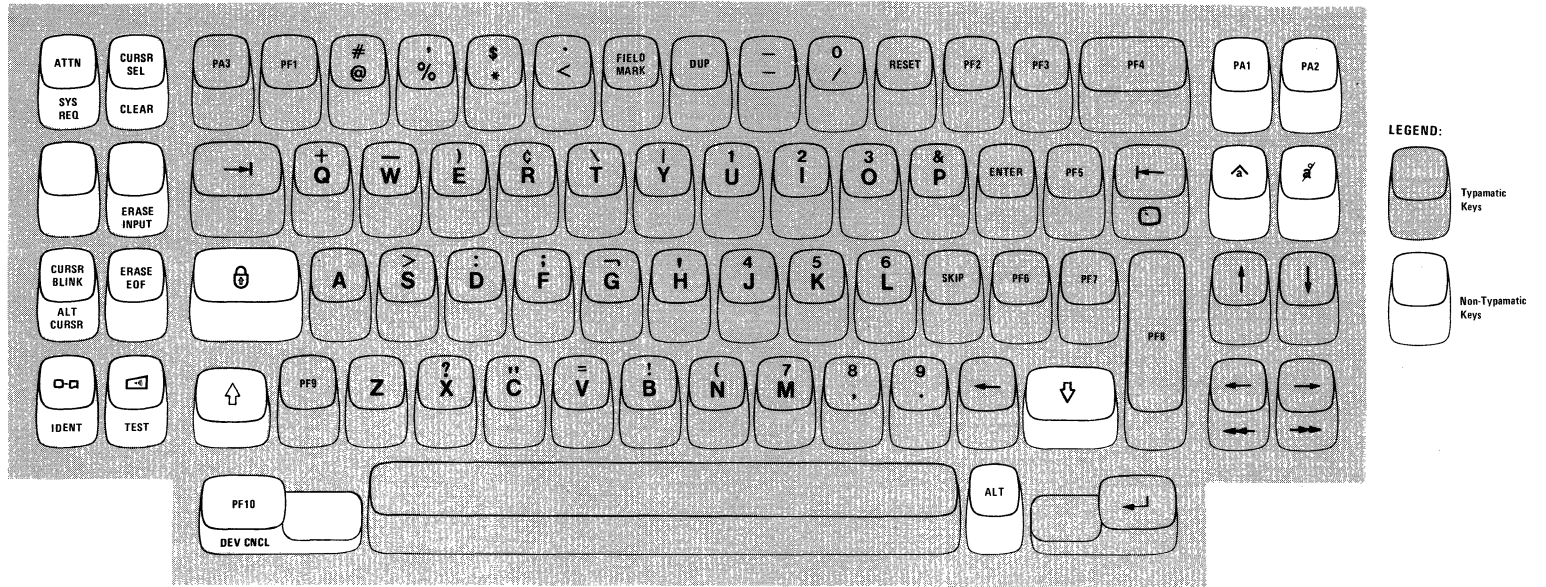
**Typewriter Keyboard**



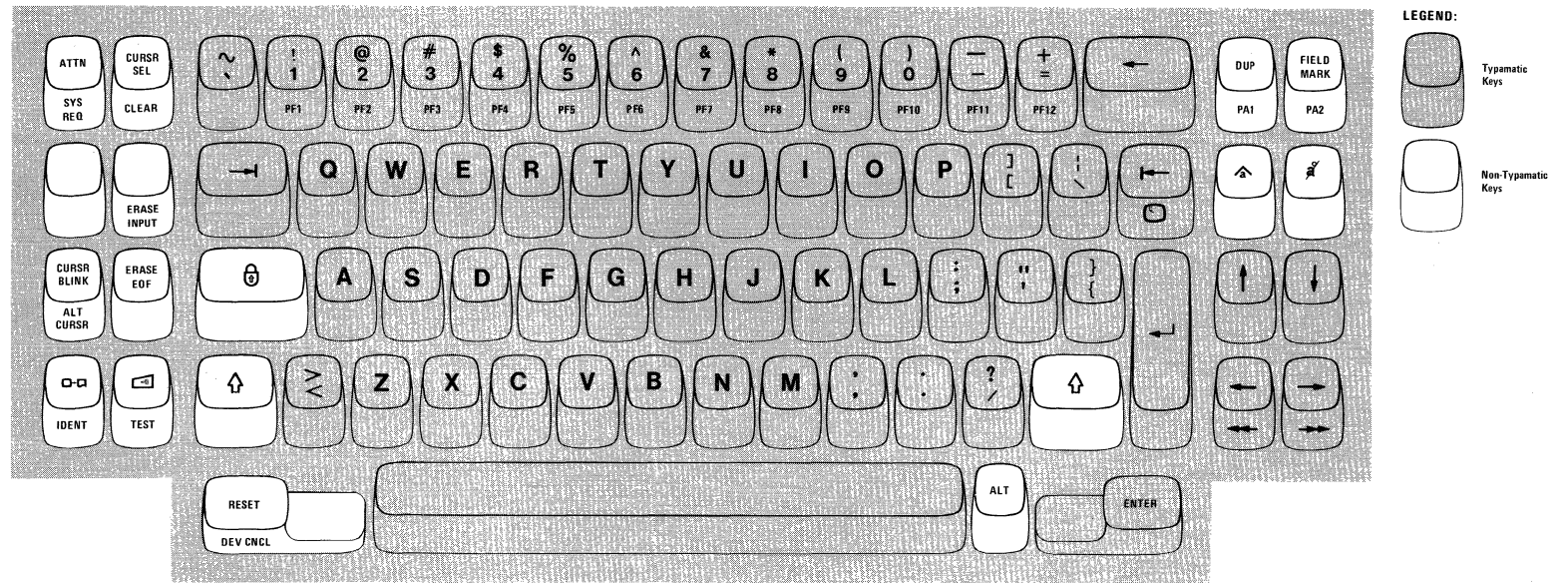
**Data Entry Keyboard**

**Figure 3-26 (Part 1 of 3). English (US) Keyboards**





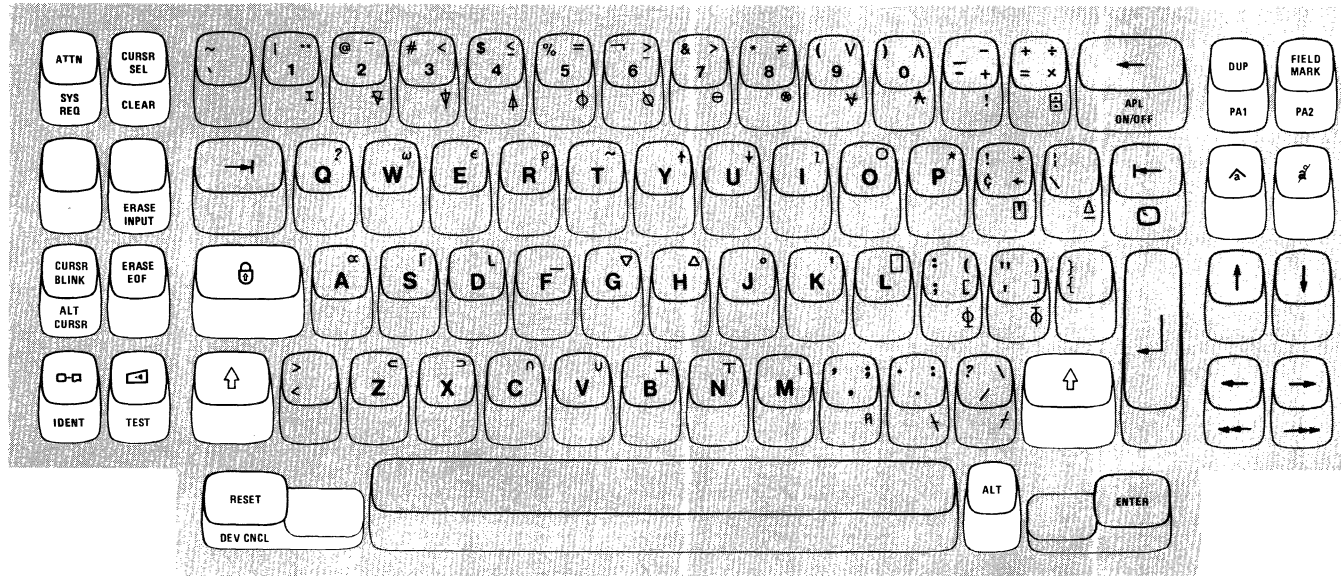
**Data Entry Keypunch Keyboard**



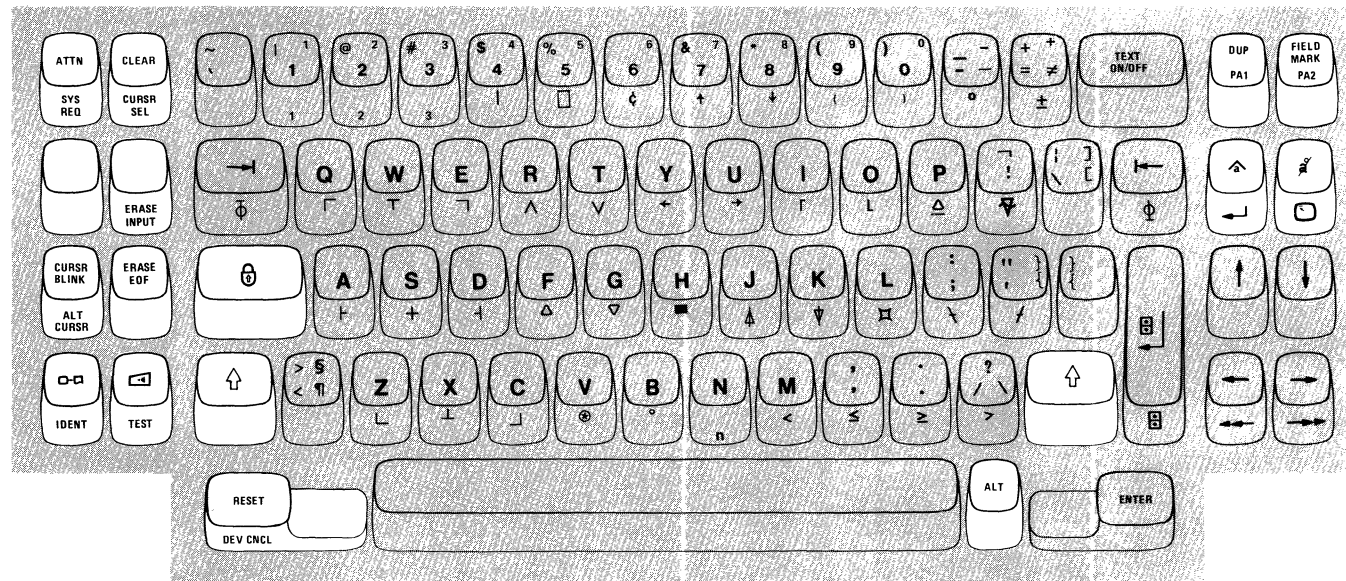
**ASCII Typewriter Keyboard**

**Figure 3-26 (Part 2 of 3). English (US) Keyboards**



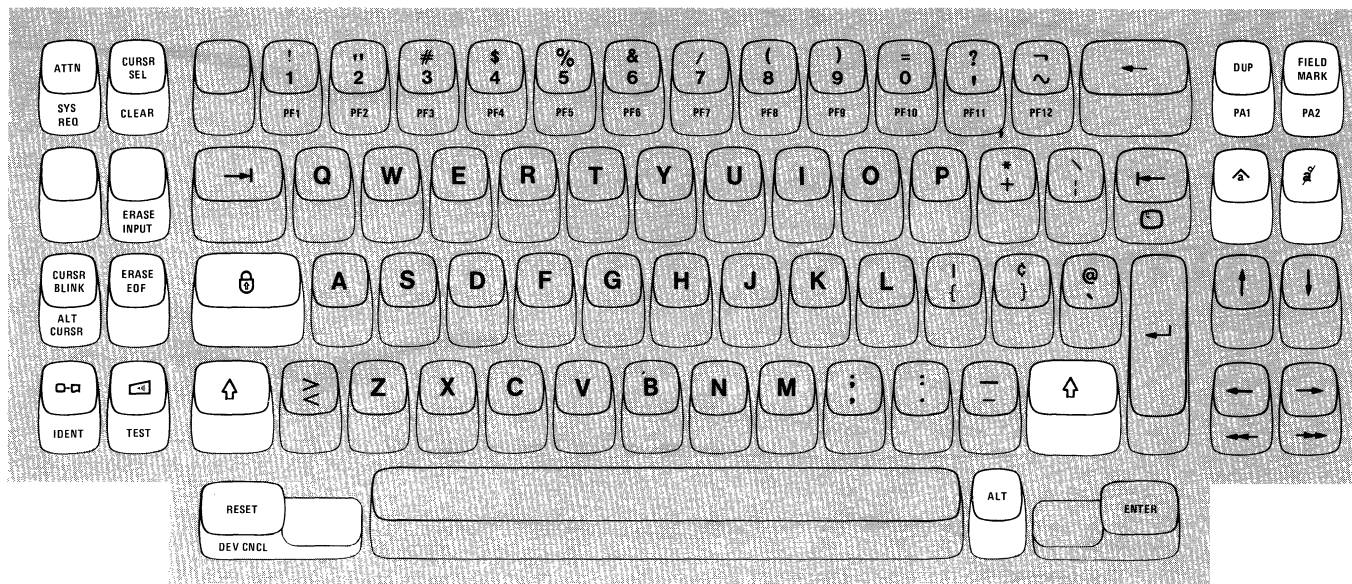


APL Keyboard

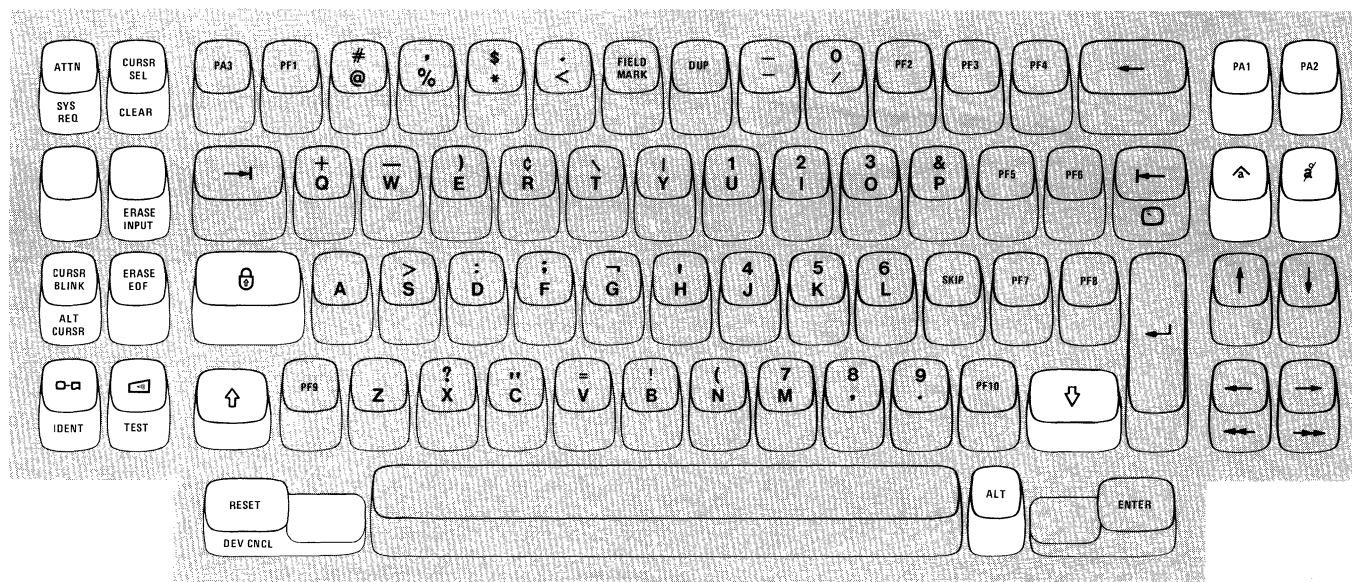


Text Keyboard

Figure 3-26 (Part 3 of 3). English (US) Keyboards

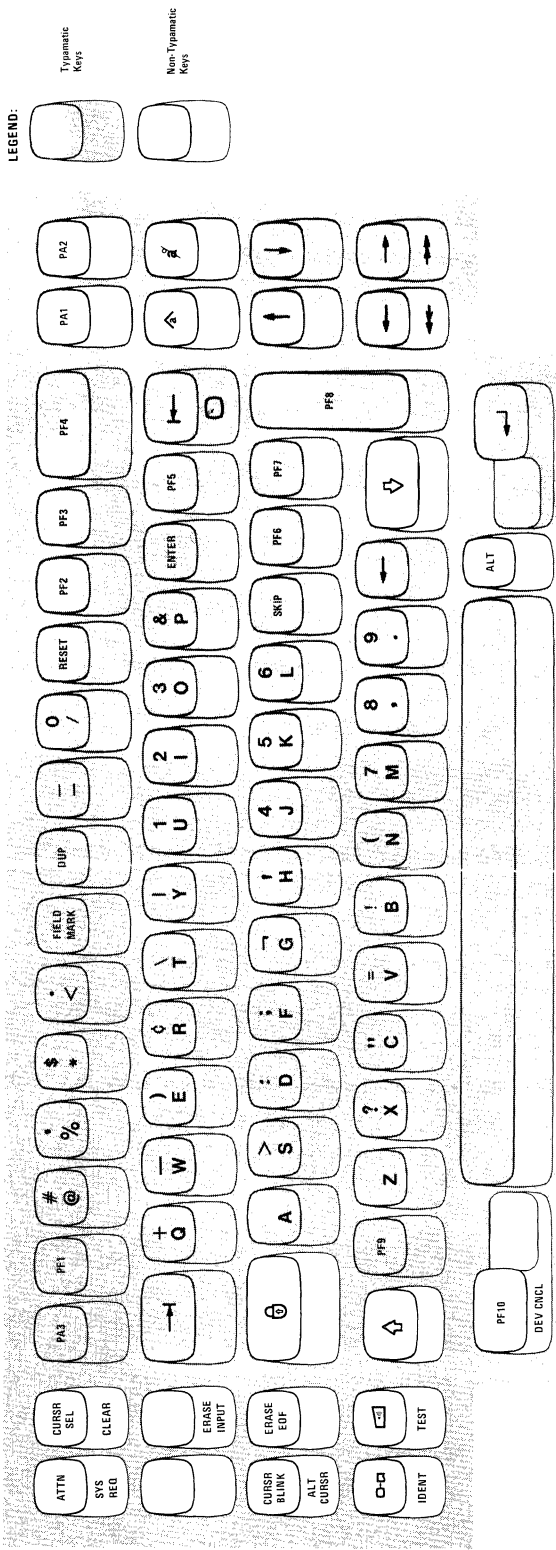


Typewriter Keyboard

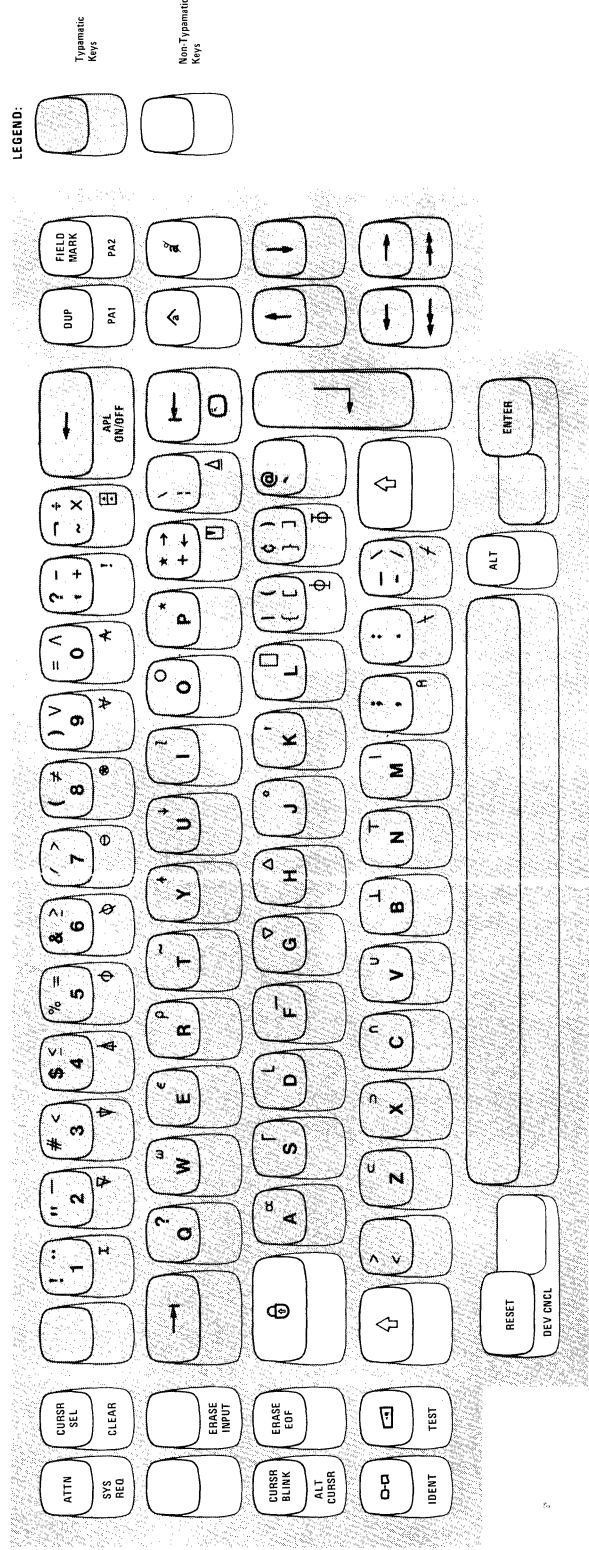


Data Entry Keyboard

Figure 3-27 (Part 1 of 2). EBCDIC (WT) Keyboards

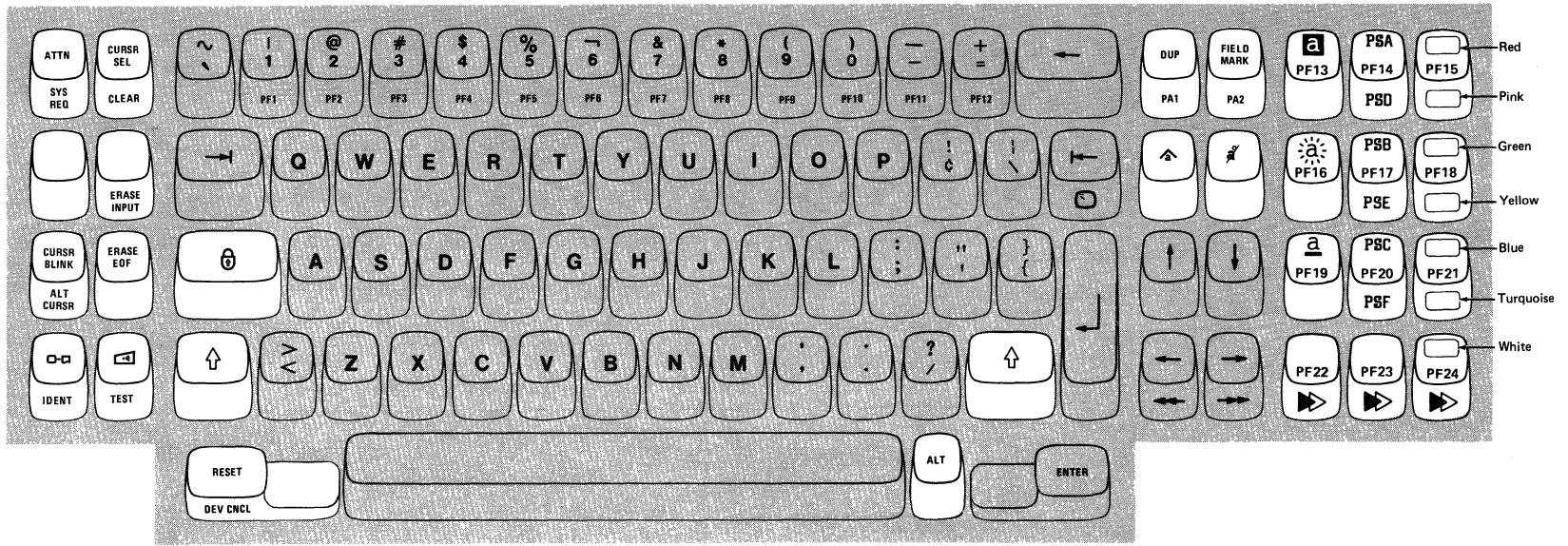


Data Entry Keypunch Keyboard



APL Keyboard

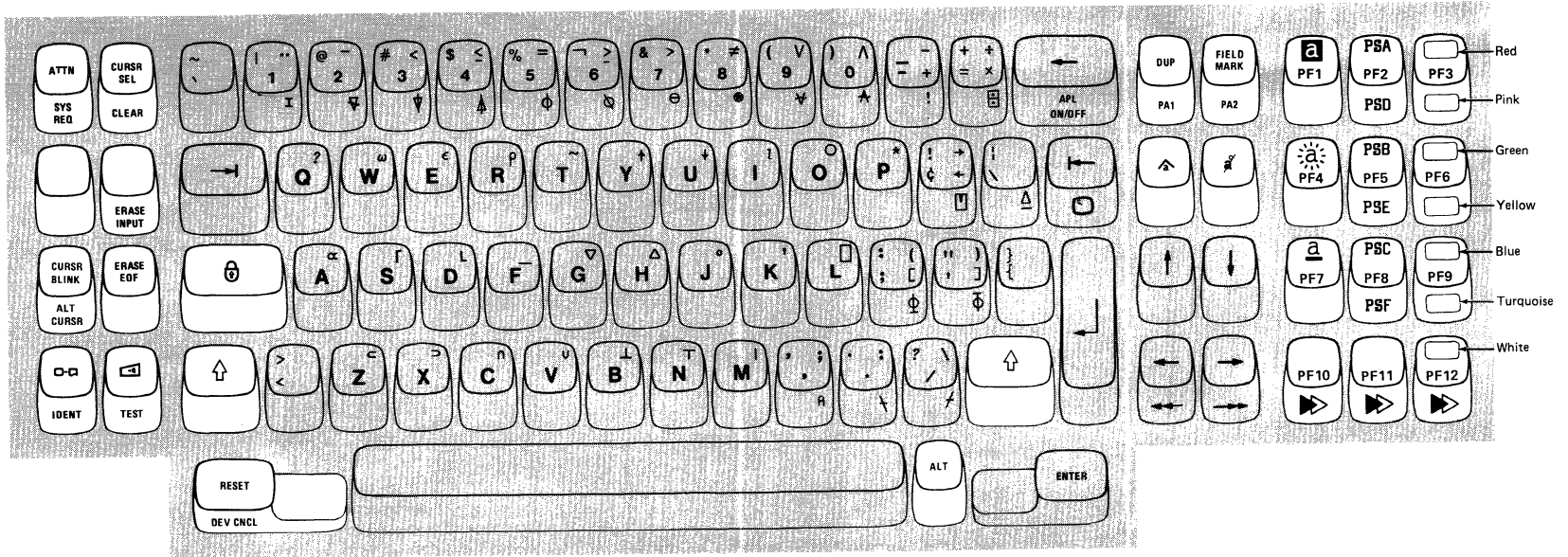
Figure 3-27 (Part 2 of 2). EBCDIC (WT) Keyboards



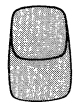
**Attribute Select Typewriter Keyboard**

**Figure 3-28 (Part 1 of 2). English (US) Attribute Select Keyboard**





**LEGEND:**



Typematic  
Keys

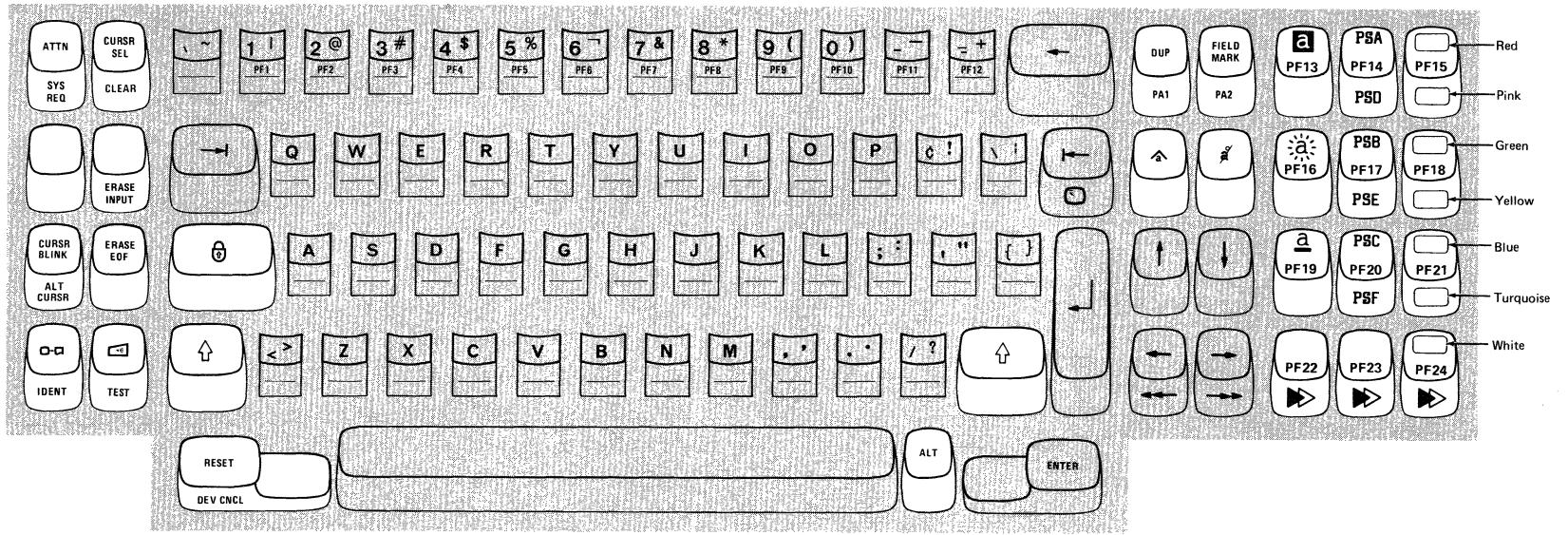


Non-Typematic  
Keys

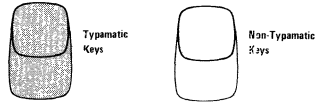
**Note:** On 87-key and 88-key APL keyboards program function keys are assigned PF1 through PF12 rather than PF13 through 24.

**Attribute Select Typewriter/APL Keyboard**

**Figure 3-28 (Part 2 of 2). English (US) Attribute Select Keyboard**



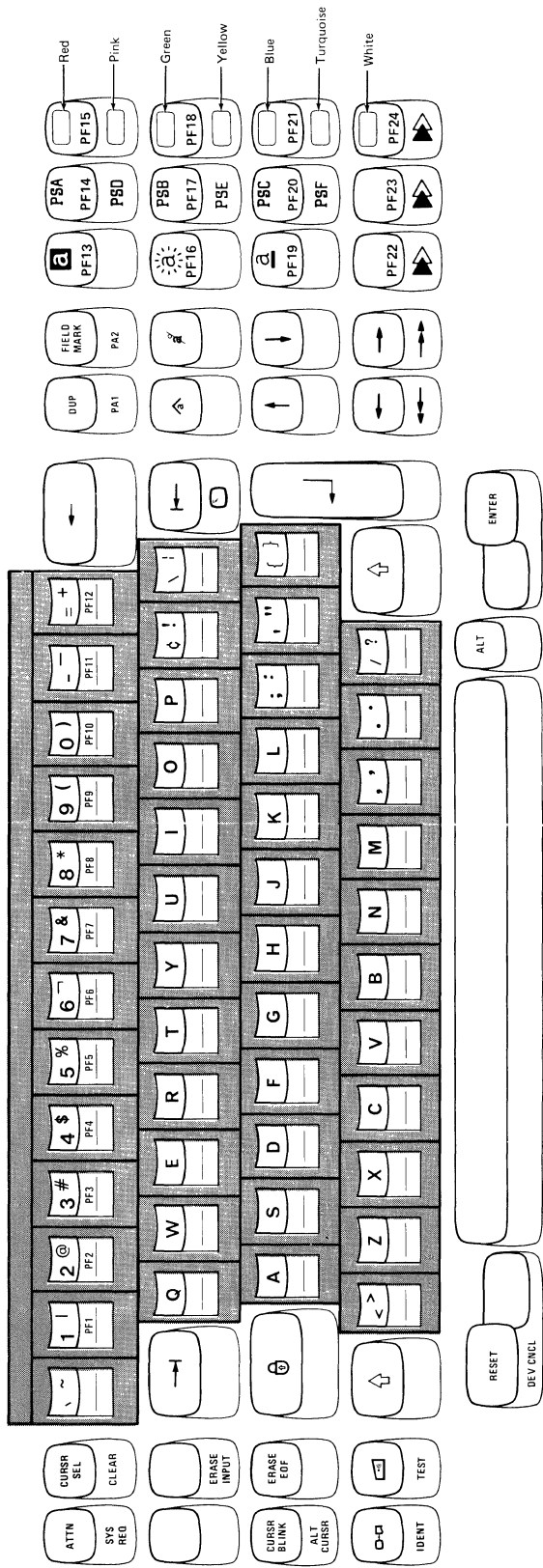
LEGEND:



Typewriter Overlay Keyboard

Figure 3-29 (Part 1 of 2). English (US) Typewriter Overlay Keyboard





Overlay Mask Location for Typewriter Overlay Keyboard

Figure 3-29 (Part 2 of 2). English (US) Typewriter Overlay Keyboard



## **Chapter 4. 3275/3277 Display Stations and 3284/3286/3287/3288 Printers – I/O Interface Codes**

This chapter contains all the I/O interface codes (Figures 4-1 through 4-21) that are required to support the 3270 display stations and associated matrix or line printers both in the United States and in World Trade countries. Included are interface codes that support certain features (dual case, APL, and Text Print) that are optional for customer use.

Bits 4567	Hex 1 ↓	00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0					SP	&	-										0
0001	1						/			a	j			A	J			1
0010	2									b	k	s		B	K	S		2
0011	3									c	l	t		C	L	T		3
0100	4									d	m	u		D	M	U		4
0101	5									e	n	v		E	N	V		5
0110	6									f	o	w		F	O	W		6
0111	7									g	p	x		G	P	X		7
1000	8									h	q	y		H	Q	Y		8
1001	9									i	r	z		I	R	Z		9
1010	A					ö	ü	!	:									
1011	B					.	Ü	,	Ä									
1100	C					<	*	%	Ö									
1101	D					(	)	-	'									
1110	E					+	;	>	=									
1111	F						┘	?	ä									

**Notes:**

- Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the resultant graphics depend upon the device used. The character displayed by the 3277 or 3275 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
- Lowercase alphabetic characters (within the dotted outlined area) are converted to uppercase by the display station or printer and are displayed or printed as uppercase characters, unless a Dual Case feature is installed on the terminal.
- NL (hex 15), EM (hex 19), FF (hex 0C), DUP (hex 1C), and FM (hex 1E) control characters are displayed or printed as 5, 9, <, \*, and ; characters, respectively, except by the printer under format control, in which case NL and EM do not result in the printing of a character.
- Attribute, write control (WCC), copy control (CCC), CU and device address, buffer address, sense, and status characters are assigned so that each character can be represented by a graphic character within the solid outlined portion of this figure.
- The | character (hex 6A) is printed by the 3287 and 3288, but is not displayed.
- Dual case 3287 prints German sharp S/BETA, receiving code 6A.

**Figure 4-1. Austrian/German I/O Interface Code (3275, 3277, 3284, 3286, 3287, 3288)**

		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3
Hex 1 ↓		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0 ←
0000	0					SP	&	-										0
0001	1							/		a	j			A	J			1
0010	2									b	k	s		B	K	S		2
0011	3									c	l	t		C	L	T		3
0100	4									d	m	u		D	M	U		4
0101	5									e	n	v		E	N	V		5
0110	6									f	o	w		F	O	W		6
0111	7									g	p	x		G	P	X		7
1000	8									h	q	y		H	Q	Y		8
1001	9									i	r	z		I	R	Z		9
1010	A					ç	ì	í	î									
1011	B					·	\$	,	#									
1100	C					<	*	%	@									
1101	D					'	)	-	'									
1110	E					†	;	>	=									
1111	F						¬	>	..									

**Notes:**

- Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the resultant graphics depend upon the device used. The character displayed by the 3277 or 3275 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
- Lowercase alphabetic characters (shown within the dotted outlined area) are converted to uppercase by the display station or printer and displayed or printed as uppercase characters, unless a Dual Case feature is installed on the terminal.
- NL (hex 15), EM (hex 19), FF (hex 0C), DUP (hex 1C), and FM (hex 1E) control characters are displayed or printed as 5, 9, <, \*, and ; characters, respectively, except by the printer under format control, in which case NL and EM do not result in the printing of a character.
- Attribute, write control (WCC), copy control (CCC), CU and device address, buffer address, sense, and status characters are assigned so that each character can be represented by a graphic character within the solid outlined portion of this figure.
- This figure also applies to Belgian, French, and Italian monospace I/O interface codes and graphics.
- The | character (hex 6A) is printed by the 3287 and 3288, but is not displayed.
- The dual case 3287 prints all characters within the outlined areas of this figure, with the following substitutions:

Hex Code	Prints As
4A	c r e a t e r
5A	
7B	
7C	
7F	

Figure 4-2. Belgian I/O Interface Code (3275, 3277, 3284, 3286, 3287, 3288)

Hex 1 Bits 4567		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0					SP	&	-										0
0001	1							/		a	j			A	J			1
0010	2									b	k	s		B	K	S		2
0011	3									c	l	t		C	L	T		3
0100	4									d	m	u		D	M	U		4
0101	5									e	n	v		E	N	V		5
0110	6									f	o	w		F	O	W		6
0111	7									g	p	x		G	P	X		7
1000	8									h	q	y		H	Q	Y		8
1001	9									i	r	z		I	R	Z		9
1010	A					~a	ç		:									
1011	B					.	ç	,	õ									
1100	C					<	*	%	ã									
1101	D					(	)	-	'									
1110	E					+	;	>	=									
1111	F						¬	?	ø									

Notes:

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the resultant graphics depend upon the device used. The character displayed by the 3277 or 3275 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. Lowercase alphabetic characters (shown within the dotted outlined area) are converted to uppercase by the display station or printer and displayed or printed as uppercase characters, unless a Dual Case feature is installed on the terminal.
3. NL (hex 15), EM (hex 19), FF (hex 0C), DUP (hex 1C), and FM (hex 1E) control characters are displayed or printed as 5, 9, <, \*, and ; characters, respectively, except by the printer under format control, in which case NL and EM do not result in the printing of a character.
4. Attribute, write control (WCC), copy control (CCC), CU and device address, buffer address, sense, and status characters are assigned so that each character can be represented by a graphic character within the solid outlined portion of this figure.
5. This figure also applies to Belgian, French, and Italian monospace I/O interface codes and graphics.
6. The | character (hex 6A) is printed by the 3287 and 3288, but is not displayed.

Figure 4-3. Brazilian/Portuguese I/O Interface Code (3275, 3277, 3284, 3286, 3287, 3288)



Hex 1 Bits 4567		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0					SP	&	-										0
0001	1							/		a	j			A	J			1
0010	2									b	k	s		B	K	S		2
0011	3									c	l	t		C	L	T		3
0100	4									d	m	u		D	M	U		4
0101	5									e	n	v		E	N	V		5
0110	6									f	o	w		F	O	W		6
0111	7									g	p	x		G	P	X		7
1000	8									h	q	y		H	Q	Y		8
1001	9									i	r	z		I	R	Z		9
1010	A					¢	!		:									
1011	B					.	\$	.	#									
1100	C					<	.	%	@									
1101	D					(	)	-	'									
1110	E					+	:	>	=									
1111	F						┘	?	”									

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the resultant graphics depend upon the device used. The character displayed by the 3277 or 3275 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. Lowercase alphabetic characters (shown within the dotted outlined area) are converted to uppercase by the display station or printer and displayed or printed as uppercase characters, unless a Dual Case feature is installed on the terminal.
3. NL (hex 15), EM (hex 19), FF (hex 0C), DUP (hex 1C), and FM (hex 1E) control characters are displayed or printed as 5, 9, <, \*, and ; characters, respectively, except by the printer under format control, in which case NL and EM do not result in the printing of a character.
4. Attribute, write control (WCC), copy control (CCC), CU and device address, buffer address, sense, and status characters are assigned so that each character can be represented by a graphic character within the solid outlined portion of this figure.
5. This figure also applies to Belgian, French, and Italian monospace I/O interface codes and graphics.
6. The | character (hex 6A) is printed by the 3287 and 3288, but is not displayed.

Figure 4-4. Canadian (French) I/O Interface Code (3275, 3277, 3284, 3286, 3287, 3288)

Hex 1 Bits 4567		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	←2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	←Hex 0
0000	0					SP	&	-										0
0001	1							/		a	j			A	J			1
0010	2									b	k	s		B	K	S		2
0011	3									c	l	t		C	L	T		3
0100	4									d	m	u		D	M	U		4
0101	5									e	n	v		E	N	V		5
0110	6									f	o	w		F	O	W		6
0111	7									g	p	x		G	P	X		7
1000	8									h	q	y		H	Q	Y		8
1001	9									i	r	z		I	R	Z		9
1010	A					ø	å	!	:									
1011	B					.	Å	,	Æ									
1100	C					<	*	%	ø									
1101	D					(	)	_	'									
1110	E					+	;	>	=									
1111	F						⌋	?	æ									

- Notes:**
- Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the resultant graphics depend upon the device used. The character displayed by the 3277 or 3275 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
  - Lowercase alphabetic characters (within the dotted outlined area) are converted to uppercase by the display station or printer and are displayed or printed as uppercase characters, unless a Dual Case feature is installed on the terminal.
  - NL (hex 15), EM (hex 19), FF (hex 0C), DUP (hex 1C), and FM (hex 1E) control characters are displayed or printed as 5, 9, <, \*, and ; characters, respectively, except by the printer under format control, in which case NL and EM do not result in the printing of a character.
  - Attribute, write control (WCC), copy control (CCC), CU and device address, buffer address, sense, and status characters are assigned so that each character can be represented by a graphic character within the solid outlined portion of this figure.
  - The | character (hex 6A) is printed by the 3287 and 3288, but is not displayed.

Figure 4-5. Danish/Norwegian I/O Interface Code (3275, 3277, 3284, 3286, 3287, 3288)

		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	←2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	←Hex 0
0000	0					SP	&	-										0
0001	1							/		a	j			A	J			1
0010	2									b	k	s		B	K	S		2
0011	3									c	l	t		C	L	T		3
0100	4									d	m	u		D	M	U		4
0101	5									e	n	v		E	N	V		5
0110	6									f	o	w		F	O	W		6
0111	7									g	p	x		G	P	X		7
1000	8									h	q	y		H	Q	Y		8
1001	9									i	r	z		I	R	Z		9
1010	A					ö	å	!	:									
1011	B					.	Ä	,	Ä									
1100	C					<	*	%	Ö									
1101	D					(	)	-	'									
1110	E					+	;	>	=									
1111	F						⌋	?	ä									

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the resultant graphics depend upon the device used. The character displayed by the 3277 or 3275 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. Lowercase alphabetic characters (within the dotted outlined area) are converted to uppercase by the display station or printer and are displayed or printed as uppercase characters, unless a Dual Case feature is installed on the terminal.
3. NL (hex 15), EM (hex 10), FF (hex 0C), DUP (hex 1C), and FM (hex 1E) control characters are displayed or printed as 5, 9, <, \*, and ; characters, respectively, except by the printer under format control, in which case NL and EM do not result in the printing of a character.
4. Attribute, write control (WCC), copy control (CCC), CU and device address, buffer address, sense, and status characters are assigned so that each character can be represented by a graphic character within the solid outlined portion of this figure.
5. The | character (hex 6A) is printed by the 3287 and 3288, but is not displayed.

**Figure 4-6. Finnish/Swedish I/O Interface Code (3275, 3277, 3284, 3286, 3287, 3288)**

Bits 4567	Hex 1	00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0					SP	&	-										0
0001	1							/		a	j			A	J		1	
0010	2									b	k	s		B	K	S	2	
0011	3									c	l	t		C	L	T	3	
0100	4									d	m	u		D	M	U	4	
0101	5									e	n	v		E	N	V	5	
0110	6									f	o	w		F	O	W	6	
0111	7									g	p	x		G	P	X	7	
1000	8									h	q	y		H	Q	Y	8	
1001	9									i	r	z		I	R	Z	9	
1010	A					ç	!	;	:									
1011	B					.	\$	,	#									
1100	C					<	*	%	@									
1101	D					(	)	_	'									
1110	E					+	;	>	=									
1111	F						¬	?	"									

**Notes:**

- Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the resultant graphics depend upon the device used. The character displayed by the 3277 or 3275 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
- Lowercase alphabetic characters (within the dotted outlined area) are converted to uppercase by the display station or printer and are displayed or printed as uppercase characters, unless a Dual Case feature is installed on the terminal.
- NL (hex 15), EM (hex 19), FF (hex 0C), DUP (hex 1C), and FM (hex 1E) control characters are displayed or printed as 5, 9, <, \*, and ; characters, respectively, except by the printer under format control, in which case NL and EM do not result in the printing of a character.
- Attribute, write control (WCC), copy control (CCC), CU and device address, buffer address, sense, and status characters are assigned so that each character can be represented by a graphic character within the solid outlined portion of this figure.
- This figure also applies to Belgian, French, and Italian monospace I/O interface codes and graphics.
- The ç character (hex 6A) is printed by the 3287 and 3288, but is not displayed.
- The dual case 3287 prints all characters within the outlined areas of this figure with the following substitutions:

Hex Code	Prints As
4A	ç
5A	è
7B	é
7C	à
7F	ù

Figure 4-7. French I/O Interface Code (3275, 3277, 3284, 3286, 3287, 3288)

Hex 1	Bits 4567	00				01				10				11				Bits
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	0,1
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	2,3
Hex 0																		Hex 0
0000	0					SP	&	-										0
0001	1						/			a	j			A	J			1
0010	2									b	k	s		B	K	S		2
0011	3									c	l	t		C	L	T		3
0100	4									d	m	u		D	M	U		4
0101	5									e	n	v		E	N	V		5
0110	6									f	o	w		F	O	W		6
0111	7									g	p	x		G	P	X		7
1000	8									h	q	y		H	Q	Y		8
1001	9									i	r	z		I	R	Z		9
1010	A					ç	!	¡	:									
1011	B					.	\$	,	#									
1100	C					<	•	%	@									
1101	D					(	)	_	'									
1110	E					+	;	>	=									
1111	F						⌋	?	"									

Notes:

- Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the resultant graphics depend upon the device used. The character displayed by the 3277 or 3275 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
- Lowercase alphabetic characters (within the dotted outlined area) are converted to uppercase by the display station or printer and are displayed or printed as uppercase characters, unless a Dual Case feature is installed on the terminal.
- NL (hex 15), EM (hex 19), FF (hex 0C), DUP (hex 1C), and FM (hex 1E) control characters are displayed or printed as 5, 9, <, \*, and ; characters, respectively, except by the printer under format control, in which case NL and EM do not result in the printing of a character.
- Attribute, write control (WCC), copy control (CCC), CU and device address, buffer address, sense, and status characters are assigned so that each character can be represented by a graphic character within the solid outlined portion of this figure.
- This figure also applies to Belgian, French, and Italian monospace I/O interface codes and graphics.
- The | character (hex 6A) is printed by the 3287 and 3288, but is not displayed.
- The dual case 3287 prints all characters within the outlined areas of this figure with the following substitutions:

Hex Code	Prints As
4A	ç
5A	!
7B	,
7C	%
7F	"

Figure 4-8. Italian I/O Interface Code (3275, 3277, 3284, 3286, 3287, 3288)

Second  
Hex  
Char.

First  
Hex  
Char.  
Bits

		00				01				10				11				
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	← 0,1
Bits 4567	Hex 1	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	← 2,3
		Hex 0																
0000	0					SP	&	-			ソ					\$	0	
0001	1					。	エ	/		ア	タ			A	J		1	
0010	2					「	オ			イ	チ	ハ		B	K	S	2	
0011	3					」	カ			ウ	ツ	ホ		C	L	T	3	
0100	4					、	ユ			イ	テ	マ		D	M	U	4	
0101	5					・	ヨ			オ	ト	ミ		E	N	V	5	
0110	6					ヲ	ツ			カ	ナ	ム		F	O	W	6	
0111	7					ア				キ	ニ	メ		G	P	X	7	
1000	8					イ	-			ク	ヌ	モ		H	Q	Y	8	
1001	9					ウ				ケ	ネ	ハ		I	R	Z	9	
1010	A								:	コ	ノ	ユ	レ					
1011	B					.	¥	,	#				□					
1100	C					<	*	%	@	サ		ヨ	ワ					
1101	D					(	)	_	'	シ	ハ	ラ	ン					
1110	E					+	;	>	=	ス	ヒ	リ	ハ					
1111	F						フ	?		セ	フ	ル	。					

Notes:

- Character code (hex 40 through hex FF) assignments other than those shown within the heavily outlined portions of this figure are undefined. If an undefined character code is programmed, the character that will be displayed is not specified. The character displayed by the 3277 or 3275 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
- Hex codes 4A, 5A, 6A, and 7F are used for CU addressing, device addressing, buffer addressing, and control purposes (for example, WCC and CCC), but have no associated graphic characters.
- NL (hex 15) displays or prints as Blank 5  
EM (hex 19) displays or prints as Blank 9  
DUP (hex 1C) displays or prints as \* (asterisk)  
FM (hex 1E) displays or prints as ; (semicolon)  
Exceptions: A printer not operating under format control does not print a character when NL or EM is decoded, but performs the specified function.
- NL and EM are stored in the buffer in two buffer locations. The Katakana hardware expands the NL and EM characters received from the program to the required 2-byte sequence. It also contracts the 2-byte buffer sequence to the EBCDIC NL or EM code to transfer back to the program.

Figure 4-9. Japanese (Katakana) I/O Interface Code (3275, 3277, 3284, 3286, 3287, 3288)



Hex 1 Bits 4567		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0					SP	&	-										0
0001	1							/		a	j			A	J		1	
0010	2									b	k	s		B	K	S	2	
0011	3									c	l	t		C	L	T	3	
0100	4									d	m	u		D	M	U	4	
0101	5									e	n	v		E	N	V	5	
0110	6									f	o	w		F	O	W	6	
0111	7									g	p	x		G	P	X	7	
1000	8									h	q	y		H	Q	Y	8	
1001	9									i	r	z		I	R	Z	9	
1010	A					~	a	ç		:								
1011	B					.	ç	,	õ									
1100	C					<	*	%	ã									
1101	D					(	)	-	'									
1110	E					+	;	>	=									
1111	F						⌋	?	õ									

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the resultant graphics depend upon the device used. The character displayed by the 3277 or 3275 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. Lowercase alphabetic characters (within the dotted outlined area) are converted to uppercase by the display station or printer and are displayed or printed as uppercase characters, unless a Dual Case feature is installed on the terminal.
3. NL (hex 15), EM (hex 0C), DUP (hex 1C), and FM (hex 1E) control characters are displayed or printed as 5, 9, <, \*, and ; characters, respectively, except by the printer under format control, in which case NL and EM do not result in the printing of a character.
4. Attribute, write control (WCC), copy control (CCC), CU and device address, buffer address, sense, and status characters are assigned so that each character can be represented by a graphic character within the solid outlined portion of this figure.
5. The | character (hex 6A) is printed by the 3287 and 3288, but is not displayed.

Figure 4-10. Portuguese I/O Code (3275, 3277, 3284, 3286, 3287, 3288)

Hex 1 Bits 4567		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	← 2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	← Hex 0
0000	0					SP	&	-										0
0001	1							/		a	j			A	J		1	
0010	2									b	k	s		B	K	S	2	
0011	3									c	l	t		C	L	T	3	
0100	4									d	m	u		D	M	U	4	
0101	5									e	n	v		E	N	V	5	
0110	6									f	o	w		F	O	W	6	
0111	7									g	p	x		G	P	X	7	
1000	8									h	q	y		H	Q	Y	8	
1001	9									i	r	z		I	R	Z	9	
1010	A					¢	!	!	:									
1011	B					.	Pt	.	Ñ									
1100	C					<	*	%	@									
1101	D					(	)	_	'									
1110	E					+	;	>	=									
1111	F						∟	?	ñ									

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character is programmed, the resultant graphics depend upon the device used. The character displayed by the 3277 or 3275 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. Lowercase alphabetic characters (within the dotted outlined area) are converted to uppercase by the display station or printer and are displayed as uppercase characters, unless a Dual Case feature is installed on the terminal.
3. NL (hex 15), EM (hex 19), FF (hex 0C), DUP (hex 1C), and FM (hex 1E) control characters are displayed or printed as 5, 9, <, \*, and ; characters, respectively, except by the printer under format control, in which case NL and EM do not result in the printing of a character.
4. Attribute, write control (WCC), copy control (CCC), CU and device address, buffer address, sense, and status characters are assigned so that each character can be represented by a graphic character within the solid outlined portion of this figure.
5. The ¡ character (hex 6A) is printed by the 3287 and 3288, but is not displayed.

**Figure 4-11. Spanish I/O Interface Code (3275, 3277, 3284, 3286, 3287, 3288)**

Hex 1 Bits 4567		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0					SP	&	-										0
0001	1							/		a	j			A	J			1
0010	2									b	k	s		B	K	S		2
0011	3									c	l	t		C	L	T		3
0100	4									d	m	u		D	M	U		4
0101	5									e	n	v		E	N	V		5
0110	6									f	o	w		F	O	W		6
0111	7									g	p	x		G	P	X		7
1000	8									h	q	y		H	Q	Y		8
1001	9									i	r	z		I	R	Z		9
1010	A					¢	!	!	:									
1011	B					.	Pt	.	~									
1100	C					<	*	%	@									
1101	D					(	)	-	'									
1110	E					+	;	>	=									
1111	F						⌋	?	~									

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the resultant graphics depend upon the device used. The character displayed by the 3277 or 3275 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. Lowercase alphabetic characters (shown within the dotted outlined area) are converted to uppercase by the display station or printer and displayed or printed as uppercase characters, unless a Dual Case feature is installed on the terminal.
3. NL (hex 15), EM (hex 19), FF (hex 0C), DUP (hex 1C), and FM (hex 1E) control characters are displayed or printed as 5, 9, <, \*, and ; characters, respectively, except by the printer under format control, in which case NL and EM do not result in the printing of a character.
4. Attribute, write control (WCC), copy control (CCC), CU and device address, buffer address, sense, and status characters are assigned so that each character can be represented by a graphic character within the solid outlined portion of this figure.
5. This figure also applies to Belgian, French, and Italian monospace I/O interface codes and graphics.
6. The | character (hex 6A) is printed by the 3287 and 3288, but is not displayed.

**Figure 4-12. Spanish-Speaking I/O Interface Code (3275, 3277, 3284, 3286, 3287, 3288)**

Hex 1 ↓ Bits 4567		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0					SP	&	-										0
0001	1							/		a	j			A	J		1	
0010	2									b	k	s		B	K	S	2	
0011	3									c	l	t		C	L	T	3	
0100	4									d	m	u		D	M	U	4	
0101	5									e	n	v		E	N	V	5	
0110	6									f	o	w		F	O	W	6	
0111	7									g	p	x		G	P	X	7	
1000	8									h	q	y		H	Q	Y	8	
1001	9									i	r	z		I	R	Z	9	
1010	A					\$	!	!	:									
1011	B					.	£	.	#									
1100	C					<	*	%	@									
1101	D					(	)	_	'									
1110	E					+	;	>	=									
1111	F						⌋	?	"									

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the resultant graphics depend upon the device used. The character displayed by the 3277 or 3275 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. Lowercase alphabetic characters (within the dotted outlined area) are converted to uppercase by the display station or printer and are displayed or printed as uppercase characters, unless a Dual Case feature is installed on the terminal.
3. NL (hex 15), EM (hex 19), FF (hex 0C), DUP (hex 1C), and FM (hex 1E) control characters are displayed or printed as 5, 9, <, \*, and ; characters, respectively, except by the printer under format control, in which case NL and EM do not result in the printing of a character.
4. Attribute, write control (WCC), copy control (CCC), CU and device address, buffer address, sense, and status characters are assigned so that each character can be represented by a graphic character within the solid outlined portion of this figure.
5. The ⌋ character (hex 6A) is printed by the 3287 and 3288, but is not displayed.

**Figure 4-13. English (UK) I/O Interface Code (3275, 3277, 3284, 3286, 3287, 3288)**

Hex 1 Bits 4567		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	← 2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	← Hex 0
0000	0					SP	&	-										0
0001	1							/		a	j			A	J			1
0010	2									b	k	s		B	K	S		2
0011	3									c	l	t		C	L	T		3
0100	4									d	m	u		D	M	U		4
0101	5									e	n	v		E	N	V		5
0110	6									f	o	w		F	O	W		6
0111	7									g	p	x		G	P	X		7
1000	8									h	q	y		H	Q	Y		8
1001	9									i	r	z		I	R	Z		9
1010	A					¢	!	!	:									
1011	B					.	\$		#									
1100	C					<	*	%	@									
1101	D					(	)	_	'									
1110	E					+	;	>	=									
1111	F						⌋	?	"									

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the resultant graphics depend upon the device used. The character displayed by the 3277 or 3275 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. Lowercase alphabetic characters (shown within the dotted outlined area) are converted to uppercase by the display station or printer and displayed or printed as uppercase characters, unless a Dual Case feature is installed on the terminal.
3. NL (hex 15), EM (hex 19), FF (hex 0C), DUP (hex 1C), and FM (hex 1E) control characters are displayed or printed as 5, 9, <, \*, and ; characters, respectively, except by the printer under format control, in which case NL and EM do not result in the printing of a character.
4. Attribute, write control (WCC), copy control (CCC), CU and device address, buffer address, sense, and status characters are assigned so that each character can be represented by a graphic character within the solid outlined portion of this figure.
5. This figure also applies to Belgian, French, and Italian monospace I/O interface codes and graphics.
6. The | character (hex 6A) is printed by the 3287 and 3288, but is not displayed.

Figure 4-14. English (US) I/O Interface Code (3275, 3277, 3284, 3286, 3287, 3288)

					0	0	0	0	1	1	1	1
					0	0	1	1	0	0	1	1
					0	1	0	1	0	1	0	1
b <sub>4</sub>	b <sub>3</sub>	b <sub>2</sub>	b <sub>1</sub>	Hex 0	0	1	2	3	4	5	6	7
				Hex 1								
0	0	0	0	0			SP	0	@	P		p
0	0	0	1	1			!	1	A	Q	a	q
0	0	1	0	2			"	2	B	R	b	r
0	0	1	1	3			#	3	C	S	c	s
0	1	0	0	4			\$	4	D	T	d	t
0	1	0	1	5			%	5	E	U	e	u
0	1	1	0	6			&	6	F	V	f	v
0	1	1	1	7			'	7	G	W	g	w
1	0	0	0	8			(	8	H	X	h	x
1	0	0	1	9			)	9	I	Y	i	y
1	0	1	0	A			*	:	J	Z	j	z
1	0	1	1	B			+	;	K	[	k	
1	1	0	0	C			,	<	L	\	l	
1	1	0	1	D			-	=	M	]	m	
1	1	1	0	E			.	>	N	^	n	
1	1	1	1	F			/	?	O	_	o	

Notes:

- Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the resultant graphics depend upon the device used. The character displayed by the 3277 or 3275 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
- Lowercase alphabetic characters (shown within the dotted outlined area) are converted to uppercase by the display station or printer and displayed or printed as uppercase characters, unless a Dual Case feature is installed on the terminal.
- NL (hex 15), EM (hex 19), FF (hex 0C), DUP (hex 1C), and FM (hex 1E) control characters are displayed or printed as 5, 9, <, \*, and ; characters, respectively, except by the printer under format control, in which case NL and EM do not result in the printing of a character.
- Attribute, write control (WCC), copy control (CCC), CU and device address, buffer address, sense, and status characters are assigned so that each character can be represented by a graphic character within the solid outlined portion of this figure.
- The ASCII A option displays and prints I and ^ for interface codes 21 and 5E (hex), respectively. The ASCII B option displays and prints ! and ^ for codes 21 and 5E (hex), respectively.
- This figure applies to 3277 units attached to 3274 control units.

Figure 4-15. English (US) ASCII I/O Interface Code (3275, 3277, 3284, 3286, 3287, 3288)



		00				01				10				11				Bits
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	0,1
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	2,3
Bits	Hex 1																	Hex 0
4567	↓																	
0000	0																	0
0001	1																	1
0010	2																	2
0011	3																	3
0100	4																	4
0101	5																	5
0110	6																	6
0111	7																	7
1000	8																	8
1001	9																	9
1010	A							*	Special (Note 1)									
1011	B							SOR										
1100	C							EOI										
1101	D							*	Field Separator									
1110	E							*	Unassigned									
1111	F							EOR										

**Notes:**

1. Special A. This character is reserved for operator identification and must be located in the first data position.
2. SOR (Start of Record). This character is a *graphic* # (not displayed), indicating the beginning of a record on the card.
3. EOI (End of Inquiry). This character is a *graphic* @ (not displayed) that can be used as a termination character on the card.
4. EOR (End of Record). This character is a *graphic* " (not displayed) that can also be used as a termination character.

**Figure 4-16. 3275/3277 Compatible 10-Character Set**

Bits 4567		00				01				10				11				Bits
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	0,1
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0					SP	&	-			□	-	α					0
0001	1							/		a	j		ε	A	J			1
0010	2									b	k	s	ι	B	K	S		2
0011	3									c	l	t	ρ	C	L	T		3
0100	4									d	m	u	ω	D	M	U		4
0101	5									e	n	v		E	N	V		5
0110	6									f	o	w	X	F	O	W		6
0111	7									g	p	x	\	G	P	X		7
1000	8									h	q	y	÷	H	Q	Y		8
1001	9									i	r	z		I	R	Z		9
1010	A					¢	!		:	↑	▷	∩	∇					
1011	B					.	\$	,	#		◁	∪	Δ					
1100	C					<	*	%	@	≤		⊥	⊤					
1101	D					(	)	_	'	⌈	○	[	]					
1110	E					+	;	>	=	ℓ		≥	≠					
1111	F						┘	?	"	→	←	◦						

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the resultant graphics depend upon the device used. The character displayed by the 3277 or 3275 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. NL (hex 15), EM (hex 19), FF (hex 0C), DUP (hex 1C), and FM (hex 1E) control characters are displayed or printed as 5, 9, \*, and ; characters, respectively, except by the printer under format control, in which case NL and EM do not result in the printing of a character.

Figure 4-17. Data Analysis APL Feature, One-Byte I/O Interface Code (3277-2, 3284-2, 3286-2, 3287-1 or -2)

Bits 4567	Hex 1 ↓	00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0									{	}	°						
0001	1									<u>A</u>	<u>J</u>	°	1					
0010	2									<u>B</u>	<u>K</u>	<u>S</u>	2	↓	I	⊖		
0011	3									<u>C</u>	<u>L</u>	<u>T</u>	3	..	!	⊞	△	
0100	4									<u>D</u>	<u>M</u>	<u>U</u>	4					
0101	5		5							<u>E</u>	<u>N</u>	<u>V</u>						
0110	6									<u>F</u>	<u>O</u>	<u>W</u>	6	∇	ψ	ϕ		
0111	7									<u>G</u>	<u>P</u>	<u>X</u>	7	⊕	⋈	ϕ		
1000	8									<u>H</u>	<u>Q</u>	<u>Y</u>	8					
1001	9		9							<u>I</u>	<u>R</u>	<u>Z</u>						
1010	A					~	⊞	^		1	2	3	n					
1011	B					~	∩	v	~		⊞	L	J					
1100	C								-		Γ	┘						
1101	D								(	)	┌	┘						
1110	E		±			ϕ	/		+		→	⊥						
1111	F					ϕ	λ		+	■	●	—						

**Notes:**

1. These codes, preceded by a hex ID control character, transmit the graphics shown.
2. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the resultant graphics depend upon the device used. The character displayed by the 3277 or 3275 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.

**Legend:**

-  Superscript
-  Subscript

**Figure 4-18. Data Analysis APL Feature, Two-Byte I/O Interface Code (3277-2, 3284-2, 3286-2, 3287-1 or -2)**

Hex 1 ↓ Bits 4567		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0					SP	&	-			□	-						0
0001	1							/		a	j			A	J			1
0010	2									b	k	s		B	K	S		2
0011	3									c	l	t		C	L	T		3
0100	4									d	m	u		D	M	U		4
0101	5									e	u	v		E	N	V		5
0110	6									f	o	w		F	O	W		6
0111	7									g	p	x	\	G	P	X		7
1000	8									h	q	y		H	Q	Y		8
1001	9									i	r	z		I	R	Z		9
1010	A					¢	!		:	↑			▽					
1011	B					.	\$	,	#				△					
1100	C					<	*	%	@	≤								
1101	D					(	)	_	'	┌		[	]					
1110	E					+	;	>	=	L		≥	≠					
1111	F						┘	?	"	→	←							

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the resultant graphics depend upon the device used. The character displayed by the 3277 or 3275 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. NL (hex 15), EM (hex 19), FF(hex 0C), DUP (hex 1C), and FM (hex 1E) control characters are displayed or printed as 5, 9, \*, and ; characters, respectively, except by the printer under format control, in which case NL and EM do not result in the printing of a character.
3. All codes shown can be entered directly from the keyboard.

Figure 4-19. Text Feature, One-Byte I/O Interface Code (3277-2, 3284-2, 3286-2, 3287-1 or -2)

Bits 4567		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0									{	}	⊙						
0001	1									°	1							
0010	2										2		↓					
0011	3										3			⊞	⊟			
0100	4										4							
0101	5		5															
0110	6										6	∇	∇	∅				
0111	7										7	⊗	⊠	⊡				
1000	8										8							
1001	9		9															
1010	A					^		1	2	3	n							
1011	B					v			⊞	⊟	⊠							
1100	C							-		⌈	⌋							
1101	D							(	)	⌈	⌋							
1110	E		±			/		+		⌈	⌋							
1111	F					\		+	■	●	-							

**Notes:**

1. These codes, preceded by a hex ID control character, transmit the graphics shown.
2. Codes 15, 19, and 1E may be used in program-to-terminal messages for characters 5, 9 and ±.
3. All codes shown can be entered directly from the keyboard.

**Legend:**

-  Superscripts
-  Subscripts

Figure 4-20. Text Feature, Two-Byte I/O Interface Code (3277-2, 3284-2, 3286-2, 3287-1 or -2)

Hex ↓		00				01				10				11				Bits
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	0,1
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	2,3
Bits	4567																	Hex 0
0000	0					SP	&	-			5	-	0					0
0001	1							/		a	j	0	1	A	J			1
0010	2									b	k	s	2	B	K	S		2
0011	3									c	l	t	3	C	L	T		3
0100	4									d	m	u	4	D	M	U		4
0101	5									e	n	v		E	N	V		5
0110	6									f	o	w	6	F	O	W		6
0111	7									g	p	x	7	G	P	X		7
1000	8									h	q	y	8	H	Q	Y		8
1001	9									i	r	z		I	R	Z		9
1010	A					¢	!	9	:	≤	±	-						
1011	B					.	\$	,	#	{	}	L	J					
1100	C					<	*	%	@			┌	┐					
1101	D					(	)	-	.	(	)	[	]					
1110	E					+	;	>	=	+		≥	≠					
1111	F						┘	?	"	†	■	●	SI					

Notes:

1. Only those data characters shown within the bold outlines can be printed by the 3288 printer with the Text Print feature installed, using the 64-character EBCDIC print belt.
2. NL (hex 15), EM (hex 19), FF (hex 0C), DUP (hex 1C), FM (hex 1E), and SI control characters are printed as 5, 9, <, \*, ; and space characters, respectively, except when line-length format is not specified, in which case NL and EM do not result in the printing of a character.
3. Hex 6A, superscript 9 shown above, causes a broken vertical bar ( | ) to be printed when the 64-character EBCDIC print belt is being used.
4. SI (BF) is Suppress Index

Legend:

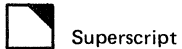


Figure 4-21. Text Print Feature I/O Interface Code (3288 Only)



## **Chapter 5. 3274/3276/3278/3279/3287/3289 I/O Interface Codes**

This chapter contains the I/O interface codes (Figures 5-1 through 5-25) that support the various 3270 keyboards and printers associated with the 3274 and 3276 Control Units both in the United States and in World Trade countries. Included is a national use differences table (Figure 5-24) that illustrates the differences in I/O interface codes for the various national languages that are supported by the 3270 Information Display System. An I/O interface code for the IBM Magnetic Slot Reader is also provided (Figure 5-25).

Hex 1 Bits 4567		00				01				10				11				Bits 0,1			
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	← 2,3			
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	← Hex 0			
0000	0					SP	&	-										ä	ü	Ö	0
0001	1							/		a	j	β		A	J						1
0010	2									b	k	s		B	K	S					2
0011	3									c	l	t		C	L	T					3
0100	4									d	m	u		D	M	U					4
0101	5									e	n	v		E	N	V					5
0110	6									f	o	w		F	O	W					6
0111	7									g	p	x		G	P	X					7
1000	8									h	q	y		H	Q	Y					8
1001	9																				
1001	9									,	i	r	z	I	R	Z					9
1010	A					Ä	Ü	ö	:												
1011	B					.	\$	,	#												
1100	C					<	*	%	§												
1101	D					(	)	_	'												
1110	E					+	;	>	=												
1111	F					!	^	?	"												

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the character that will be displayed or printed is a hyphen; hex code 60 will be returned on a subsequent read operation. The character displayed by the 3278 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. NL (hex 15), EM (hex 19), FF(hex 0C), and NUL (hex 00) are not displayed or printed. The DUP (hex 1C) and FM (hex 1E) control characters on dual-case terminals are respectively displayed as \* and ; and printed as \* and ;.
3. DUP (hex 1C) and FM (hex 1E) control characters on mono-case terminals are respectively displayed as \* and ; and printed as \* and ;.
4. The 3289, when operating in SCS mode, prints hyphens for both hex 1C and hex 1E.

**Figure 5-1. Austrian/German I/O Interface Code (3274/3276/3278/3279/3287/3289)**

Bits 4567		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	← 2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	← Hex 0
0000	0					SP	&	-										0
0001	1							/		a	j			A	J			1
0010	2									b	k	s		B	K	S		2
0011	3									c	l	t		C	L	T		3
0100	4									d	m	u		D	M	U		4
0101	5									e	n	v		E	N	V		5
0110	6									f	o	w		F	O	W		6
0111	7									g	p	x		G	P	X		7
1000	8									h	q	y		H	Q	Y		8
1001	9									i	r	z		I	R	Z		9
1010	A					ö	ü	ß	:									
1011	B					.	Ü	,	Ä									
1100	C					<	*	%	Ö									
1101	D					(	)	_	'									
1110	E					+	;	>	=									
1111	F						⌋	?	ä									

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the character that will be displayed or printed is a hyphen; hex code 60 will be returned on a subsequent read operation. The character displayed by the 3278 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. NL (hex 15), EM (hex 19), FF (hex 0C), and NUL (hex 00) are not displayed or printed. The DUP (hex 1C) and FM (hex 1E) control characters on dual-case terminals are respectively displayed as \* and ; and printed as \* and ; .
3. DUP (hex 1C) and FM (hex 1E) control characters on mono-case terminals are respectively displayed as \* and ; and printed as \* and ; .
4. The 3289, when operating in SCS mode, prints hyphens for both hex 1C and hex 1E.

**Figure 5-2. Austrian/German (Alternate) I/O Interface Code (3274/3276/3278/3279/3287/3289)**

		00				01				10				11				Bits
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	0,1
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	2,3
Hex 1	Hex 0																	Hex 0
0000	0					SP	&	-							é	è	ç	0
0001	1							/		a	j	..			A	J		1
0010	2									b	k	s			B	K	S	2
0011	3									c	l	t			C	L	T	3
0100	4									d	m	u			D	M	U	4
0101	5									e	n	v			E	N	V	5
0110	6									f	o	w			F	O	W	6
0111	7									g	p	x			G	P	X	7
1000	8									h	q	y			H	Q	Y	8
1001	9									^	i	r	z		I	R	Z	9
1010	A					□	□	¿	:									
1011	B					.	\$	.	#									
1100	C					<	*	%	à									
1101	D					(	)	_	'									
1110	E					+	;	>	=									
1111	F					!	^	?	"									

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the character that will be displayed or printed is a hyphen; hex code 60 will be returned on a subsequent read operation. The character displayed by the 3278 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. NL (hex 15), EM (hex 19), FF (hex 0C), and NUL (hex 00) are not displayed or printed. The DUP (hex 1C) and FM (hex 1E) control characters on dual-case terminals are respectively displayed as \* and ; and printed as \* and ; .
3. DUP (hex 1C) and FM (hex 1E) control characters on mono-case terminals are respectively displayed as \* and ; and printed as \* and ; .
4. The 3289, when operating in SCS mode, prints hyphens for both hex 1C and hex 1E.

Figure 5-3. Belgian I/O Interface Code (3274/3276/3278/3279/3287/3289)

		00				01				10				11				Bits 0,1
Hex 1		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3
Bits 4567		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0					SP	&	-						õ	é	\	0	
0001	1							/		a	j	~		A	J		1	
0010	2									b	k	s		B	K	S	2	
0011	3									c	l	t		C	L	T	3	
0100	4									d	m	u		D	M	U	4	
0101	5									e	n	v		E	N	V	5	
0110	6									f	o	w		F	O	W	6	
0111	7									g	p	x		G	P	X	7	
1000	8									h	q	y		H	Q	Y	8	
1001	9							ã		i	r	z		I	R	Z	9	
1010	A					É	\$	ç	:									
1011	B					.	ç	,	õ									
1100	C					<	*	%	ã									
1101	D					(	)	_	'									
1110	E					+	;	>	=									
1111	F					!	^	?	"									

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the character that will be displayed or printed is a hyphen; hex code 60 will be returned on a subsequent read operation. The character displayed by the 3278 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. NL (hex 15), EM (hex 19), FF (hex 0C), and NUL (hex 00) are not displayed or printed. The DUP (hex 1C) and FM (hex 1E) control characters on dual-case terminals are respectively displayed as \* and ;.
3. DUP (hex 1C) and FM (hex 1E) control characters on mono-case terminals are respectively displayed as \* and ; and printed as \* and ;.
4. The 3289, when operating in SCS mode, prints hyphens for both hex 1C and hex 1E.

**Figure 5-4. Brazilian I/O Interface Code (3274/3276/3278/3279/3287/3289)**

Hex 1 Bits 4567		00				01				10				11				Bits 0,1			
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3			
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0			
0000	0					SP	&	—										é	è	ç	0
0001	1							/	É	a	j	..						A	J		1
0010	2					â	ê	Â	Ê	b	k	s						B	K	S	2
0011	3						ë		Ë	c	l	t						C	L	T	3
0100	4							À	È	d	m	u						D	M	U	4
0101	5									e	n	v						E	N	V	5
0110	6						î		Î	f	o	w						F	O	W	6
0111	7						ï		Ï	g	p	x						G	P	X	7
1000	8					ƒ		ç		h	q	y						H	Q	Y	8
1001	9								`	i	r	z						I	R	Z	9
1010	A					à	’	ù	:												
1011	B					.	\$	,	#									ô	û	ô	û
1100	C					<	*	%	@										ü		Û
1101	D					(	)	_	’												Ù
1110	E					+	;	>	=												
1111	F					!	^	?	”												

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the character that will be displayed or printed is a hyphen; hex code 60 will be returned on a subsequent read operation. The character displayed by the 3278 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. NL (hex 15), EM (hex 19), FF (hex 0C), and NUL (hex 00) are not displayed or printed. The DUP (hex 1C) and FM (hex 1E) control characters on dual-case terminals are respectively displayed as \* and ; and printed as \* and ;.
3. DUP (hex 1C) and FM (hex 1E) control characters on mono-case terminals are respectively displayed as \* and ; and printed as \* and ;.
4. The 3289, when operating in SCS mode, prints hyphens for both hex 1C and hex 1E.

**Figure 5-5. Canadian (French) I/O Interface Code (3274/3276/3278/3279/3287/3289)**



		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3
Hex 1 Bits 4567		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0					SP	&	-						æ	å	\	0	
0001	1							/		a	j	ü		A	J		1	
0010	2									b	k	s		B	K	S	2	
0011	3									c	l	t		C	L	T	3	
0100	4									d	m	u		D	M	U	4	
0101	5									e	n	v		E	N	V	5	
0110	6									f	o	w		F	O	W	6	
0111	7									g	p	x		G	P	X	7	
1000	8									h	q	y		H	Q	Y	8	
1001	9									\	i	r	z	I	R	Z	9	
1010	A					#	⊗	φ	:									
1011	B					.	Å	.	Æ									
1100	C					<	*	%	φ									
1101	D					(	)	-	'									
1110	E					+	;	>	=									
1111	F					!	^	?	"									

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the character that will be displayed or printed is a hyphen; hex code 60 will be returned on a subsequent read operation. The character displayed by the 3278 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. NL (hex 15), EM (hex 19), FF (hex 0C), and NUL (hex 00) are not displayed or printed. The DUP (hex 1C) and FM (hex 1E) control characters on dual-case terminals are respectively displayed as ¯ and ;.
3. DUP (hex 1C) and FM (hex 1E) control characters on mono-case terminals are respectively displayed as \* and ; and printed as \* and ;.
4. The 3289, when operating in SCS mode, prints hyphens for both hex 1C and hex 1E.

**Figure 5-6. Danish/Norwegian I/O Interface Code (3274/3276/3278/3279/3287/3289)**

Hex 1 Bits 4567	Hex 0	00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0					SP	&	-										0
0001	1							/		a	j				A	J		1
0010	2									b	k	s			B	K	S	2
0011	3									c	l	t			C	L	T	3
0100	4									d	m	u			D	M	U	4
0101	5									e	n	v			E	N	V	5
0110	6									f	o	w			F	O	W	6
0111	7									g	p	x			G	P	X	7
1000	8									h	q	y			H	Q	Y	8
1001	9									i	r	z			I	R	Z	9
1010	A					ø	å	ı	:									
1011	B					.	Å	,	Æ									
1100	C					<	*	%	Ø									
1101	D					(	)	-	'									
1110	E					+	;	>	=									
1111	F						ı	?	æ									

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the character that will be displayed or printed is a hyphen; hex code 60 will be returned on a subsequent read operation. The character displayed by the 3278 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. NL (hex 15), EM (hex 19), FF (hex 0C), and NUL (hex 00) are not displayed or printed. The DUP (hex 1C) and FM (hex 1E) control characters on dual-case terminals are respectively displayed as \* and ; and printed as \* and ; .
3. DUP (hex 1C) and FM (hex 1E) control characters on mono-case terminals are respectively displayed as \* and ; and printed as \* and ; .
4. The 3289, when operating in SCS mode, prints hyphens for both hex 1C and hex 1E.

Figure 5-7. Danish/Norwegian (Alternate) I/O Interface Code (3274/3276/3278/3279/3287/3289)

		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3
Hex 1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0					SP	&	-						ä	å	É	0	
0001	1							/		a	j	ü		A	J		1	
0010	2									b	k	s		B	K	S	2	
0011	3									c	l	t		C	L	T	3	
0100	4									d	m	u		D	M	U	4	
0101	5									e	n	v		E	N	V	5	
0110	6									f	o	w		F	O	W	6	
0111	7									g	p	x		G	P	X	7	
1000	8									h	q	y		H	Q	Y	8	
1001	9								é	i	r	z		I	R	Z	9	
1010	A					§	⌘	ö	:									
1011	B					.	Å	,	Ä									
1100	C					<	*	%	Ö									
1101	D					(	)	_	'									
1110	E					+	;	>	=									
1111	F					!	^	?	~									

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the character that will be displayed or printed is a hyphen; hex code 60 will be returned on a subsequent read operation. The character displayed by the 3278 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. NL (hex 15), EM (hex 19), FF (hex 0C), and NUL (hex 00) are not displayed or printed. The DUP (hex 1C) and FM (hex 1E) control characters on dual-case terminals are respectively displayed as ¯ and ; and printed as \* and ;.
3. DUP (hex 1C) and FM (hex 1E) control characters on mono-case terminals are respectively displayed as \* and ; and printed as \* and ;.
4. The 3289, when operating in SCS mode, prints hyphens for both hex 1C and hex 1E.

**Figure 5-8. Finnish/Swedish I/O Interface Code (3274/3276/3278/3279/3287/3289)**

		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3
Hex 1 Bits 4567		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0					SP	&	-										0
0001	1							/		a	j			A	J			1
0010	2									b	k	s		B	K	S		2
0011	3									c	l	t		C	L	T		3
0100	4									d	m	u		D	M	U		4
0101	5									e	n	v		E	N	V		5
0110	6									f	o	w		F	O	W		6
0111	7									g	p	x		G	P	X		7
1000	8									h	q	y		H	Q	Y		8
1001	9									i	r	z		I	R	Z		9
1010	A					ö	å	ı	:									
1011	B					.	Ä	.	Ä									
1100	C					<	*	%	Ö									
1101	D					(	)	-	'									
1110	E					+	;	>	=									
1111	F						⌋	?	ä									

Notes:

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the character that will be displayed or printed is a hyphen; hex code 60 will be returned on a subsequent read operation. The character displayed by the 3278 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. NL (hex 15), EM (hex 19), FF (hex 0C), and NUL (hex 00) are not displayed or printed. The DUP (hex 1C) and FM (hex 1E) control characters on dual-case terminals are respectively displayed as \* and ; and printed as \* and ;.
3. DUP (hex 1C) and FM (hex 1E) control characters on mono-case terminals are respectively displayed as \* and ; and printed as \* and ;.
4. The 3289, when operating in SCS mode, prints hyphens for both hex 1C and hex 1E.

Figure 5-9. Finnish/Swedish (Alternate) I/O Interface Code (3274/3276/3278/3279/3287/3289)

		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	←2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	←Hex 0
0000	0					SP	&	-						é	è	ç	0	
0001	1							/		a	j	..		A	J		1	
0010	2									b	k	s		B	K	S	2	
0011	3									c	l	t		C	L	T	3	
0100	4									d	m	u		D	M	U	4	
0101	5									e	n	v		E	N	V	5	
0110	6									f	o	w		F	O	W	6	
0111	7									g	p	x		G	P	X	7	
1000	8									h	q	y		H	Q	Y	8	
1001	9								'	i	r	z		I	R	Z	9	
1010	A					°	§	ù	:									
1011	B					.	\$	,	£									
1100	C					<	*	%	à									
1101	D					(	)	_	'									
1110	E					+	;	>	=									
1111	F					!	^	?	"									

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the character that will be displayed or printed is a hyphen; hex code 60 will be returned on a subsequent read operation. The character displayed by the 3278 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. NL (hex 15), EM (hex 19), FF (hex 0C), and NUL (hex 00) are not displayed or printed. The DUP (hex 1C) and FM (hex 1E) control characters on dual-case terminals are respectively displayed as \* and ; and printed as \* and ; .
3. DUP (hex 1C) and FM (hex 1E) control characters on mono-case terminals are respectively displayed as \* and ; and printed as \* and ; .
4. The 3289, when operating in SCS mode, prints hyphens for both hex 1C and hex 1E.

**Figure 5-10. French I/O Interface Code (3274/3276/3278/3279/3287/3289)**

Hex 1 Bits 4567		00				01				10				11				Bits 0,1			
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3			
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0			
0000	0					SP	&	-										a	è	ç	0
0001	1							/		a	j	ì						A	J		1
0010	2									b	k	s						B	K	S	2
0011	3									c	l	t						C	L	T	3
0100	4									d	m	u						D	M	U	4
0101	5									e	n	v						E	N	V	5
0110	6									f	o	w						F	O	W	6
0111	7									g	p	x						G	P	X	7
1000	8									h	q	y						H	Q	Y	8
1001	9								ù	i	r	z						I	R	Z	9
1010	A					°	é	ò	:												
1011	B					.	\$	,	£												
1100	C					<	*	%	§												
1101	D					(	)	_	'												
1110	E					+	;	>	=												
1111	F					!	^	?	"												

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the character that will be displayed or printed is a hyphen; hex code 60 will be returned on a subsequent read operation. The character displayed by the 3278 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. NL (hex 15), EM (hex 19), FF (hex 0C), and NUL (hex 00) are not displayed or printed. The DUP (hex 1C) and FM (hex 1E) control characters on dual-case terminals are respectively displayed as \* and ; and printed as \* and ;.
3. DUP (hex 1C) and FM (hex 1E) control characters on mono-case terminals are respectively displayed as \* and ; and printed as \* and ;.
4. The 3289, when operating in SCS mode, prints hyphens for both hex 1C and 1E.

**Figure 5-11. Italian I/O Interface Code (3274/3276/3278/3279/3287/3289)**

Hex 1 Bits 4567		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0					SP	&	-						{	}	\	0	
0001	1							/		a	j	~		A	J		1	
0010	2									b	k	s		B	K	S	2	
0011	3									c	l	t		C	L	T	3	
0100	4									d	m	u		D	M	U	4	
0101	5									e	n	v		E	N	V	5	
0110	6									f	o	w		F	O	W	6	
0111	7									g	p	x		G	P	X	7	
1000	8									h	q	y		H	Q	Y	8	
1001	9																	
1001	9									^	r	z		I	R	Z	9	
1010	A					[	]	!	:									
1011	B					.	\$	,	#									
1100	C					<	*	%	@									
1101	D					(	)	_	'									
1110	E					+	;	>	=									
1111	F					!	^	?	"									

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the character that will be displayed or printed is a hyphen; hex code 60 will be returned on a subsequent read operation. The character displayed by the 3278 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. NL (hex 15), EM (hex 19), FF (hex 0C), and NUL (hex 00) are not displayed or printed. The DUP (hex 1C) and FM (hex 1E) control characters on dual-case terminals are respectively displayed as \* and ; and printed as \* and ;.
3. DUP (hex 1C) and FM (hex 1E) control characters on mono-case terminals are respectively displayed as \* and ; and printed as \* and ;.
4. The 3289, when operating in SCS mode, prints hyphens for both hex 1C and hex 1E.

**Figure 5-12. International I/O Interface Code (3274/3276/3278/3279/3287/3289)**



		00				01				10				11				Bits 0,1
Hex 1		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	←2,3
Bits 4567	Hex 0	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	←Hex 0
0000	0					SP	&	-						{	}	\$	0	
0001	1							/		a	j	-		A	J		1	
0010	2									b	k	s		B	K	S	2	
0011	3									c	l	t		C	L	T	3	
0100	4									d	m	u		D	M	U	4	
0101	5									e	n	v		E	N	V	5	
0110	6									f	o	w		F	O	W	6	
0111	7									g	p	x		G	P	X	7	
1000	8									h	q	y		H	Q	Y	8	
1001	9									'	i	r	z	I	R	Z	9	
1010	A					£	!	:	:									
1011	B					.	¥	,	#									
1100	C					<	*	%	@									
1101	D					(	)	-	'									
1110	E					+	;	>	=									
1111	F						⌋	?	"									

**Notes:**

- Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the character that will be displayed or printed is a hyphen; hex code 60 will be returned on a subsequent read operation. The character displayed by the 3278 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
- NL (hex 15), EM (hex 19), FF (hex 0C), and NUL (hex 00) are not displayed or printed. The DUP (hex 1C) and FM (hex 1E) control characters on dual-case terminals are respectively displayed as \* and ; and printed as \* and ;.
- DUP (hex 1C) and FM (hex 1E) control characters on mono-case terminals are respectively displayed as \* and ; and printed as \* and ;.
- The 3289, when operating in SCS mode, prints hyphens for both hex 1C and hex 1E.

**Figure 5-13. Japanese (English) I/O Interface Code (3274/3276/3278/3279/3287/3289)**

Hex 1 ↓ Bits 4567		00				01				10				11				First Hex Char. Bits ←0,1 ←2,3 Hex 0		
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11			
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F			
0000	0					SP	&	-				ソ					\$	0		
0001	1					。	エ	/				ア	タ	ー			A	J		1
0010	2					「	オ					イ	チ	ハ			B	K	S	2
0011	3					」	カ					ウ	ツ	ホ			C	L	T	3
0100	4					、	ユ					イ	テ	マ			D	M	U	4
0101	5					・	ヨ					オ	ト	ミ			E	N	V	5
0110	6					ヲ	ツ					カ	ナ	ム			F	O	W	6
0111	7					ア						キ	ニ	メ			G	P	X	7
1000	8					イ	-					ク	ヌ	モ			H	Q	Y	8
1001	9					ウ						ケ	ネ	ブ			I	R	Z	9
1010	A					£	!			:		コ	ノ	ユ	レ					
1011	B					.	¥	,	#						□					
1100	C					<	*	%	@			サ		ヨ	ワ					
1101	D					(	)	_	'			シ	ハ	ラ	ン					
1110	E					+	;	>	=			ス	ヒ	リ	ハ					
1111	F						~	?	"			セ	フ	ル	。					

**Notes:**

1. Character code (hex 40 through hex IE) assignments other than those shown are undefined. If an undefined character code is programmed, the character that will be displayed or printed is a hyphen; hex code 60 will be returned on a subsequent read operation. The character displayed by the 3278 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. NL (hex 15), EM (hex 19), FF (hex 0C), and NUL (hex 00) are not displayed or printed. The DUP (hex 1C) and FM (hex 1E) control characters on dual-case terminals are respectively displayed as \* and ; and printed as \* and ;.
3. DUP (hex 1C) and FM (hex 1E) control characters on mono-case terminals are respectively displayed as \* and ; and printed as \* and ;.
4. The 3289, when operating in SCS mode, prints hyphens for both hex 1C and hex 1E.

**Figure 5-14. Japanese (Katakana) I/O Interface Code (3274/3276/3278/3279/3287/3289)**

Hex 1 Bits 4567		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0					SP	&	-							ã	'	ç	0
0001	1							/		a	j	ç			A	J		1
0010	2									b	k	s			B	K	S	2
0011	3									c	l	t			C	L	T	3
0100	4									d	m	u			D	M	U	4
0101	5									e	n	v			E	N	V	5
0110	6									f	o	w			F	O	W	6
0111	7									g	p	x			G	P	X	7
1000	8									h	q	y			H	Q	Y	8
1001	9									i	r	z			I	R	Z	9
1010	A					□	□	õ	:									
1011	B					.	\$	.	Ã									
1100	C					ç	*	%	õ									
1101	D					(	)	-	'									
1110	E					+	;	>	=									
1111	F					!	^	?	"									

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the character that will be displayed or printed is a hyphen ; hex code 60 will be returned on a subsequent read operation. The character displayed by the 3278 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. NL (hex 15), EM (hex 19), FF (hex 0C), and NUL (hex 00) are not displayed or printed. The DUP (hex 1C) and FM (hex 1E) control characters on dual-case terminals are respectively displayed as \* and ; and printed as \* and ;.
3. DUP (hex 1C) and FM (hex 1E) control characters on mono-case terminals are respectively displayed as \* and ; and printed as \* and ;.
4. Hex 4C location will display the uppercase version of the character at hex location E0 on output. It is not used on input.
5. The 3289, when operating in SCS mode, prints hyphens for both hex 1C and hex 1E.

Figure 5-15. Portuguese I/O Interface Code (3274/3276/3278/3279/3287/3289)

Hex 1 Bits 4567		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0					SP	&	-							{	}	\	0
0001	1						/			a	j	..			A	J		1
0010	2									b	k	s			B	K	S	2
0011	3									c	i	t			C	L	T	3
0100	4									d	m	u			D	M	U	4
0101	5									e	n	v			E	N	V	5
0110	6									f	o	w			F	O	W	6
0111	7									g	p	x			G	P	X	7
1000	8									h	q	y			H	Q	Y	8
1001	9										i	r	z		I	R	Z	9
1010	A					□	□	ñ	:									
1011	B					.	Pts	,	Ñ									
1100	C					<	*	%	@									
1101	D					(	)	-	'									
1110	E					+	;	>	=									
1111	F						┘	?	"									

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the character that will be displayed or printed is a hyphen; hex code 60 will be returned on a subsequent read operation. The character displayed by the 3278 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. NL (hex 15), EM (hex 19), FF (hex 0C), and NUL (hex 00) are not displayed or printed. The DUP (hex 1C) and FM (hex 1E) control characters on dual-case terminals are respectively displayed as ¯ and ¯ and printed as \* and ;.
3. DUP (hex 1C) and FM (hex 1E) control characters on mono-case terminals are respectively displayed as \* and ; and printed as \* and ;.
4. The 3289, when operating in SCS mode, prints hyphens for both hex 1C and hex 1E.

**Figure 5-16. Spanish I/O Interface Code (3274/3276/3278/3279/3287/3289)**

Hex 1 Bits 4567		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0					SP	&	-										0
0001	1							/		a	j			A	J			1
0010	2									b	k	s		B	K	S		2
0011	3									c	l	t		C	L	T		3
0100	4									d	m	u		D	M	U		4
0101	5									e	n	v		E	N	V		5
0110	6									f	o	w		F	O	W		6
0111	7									g	p	x		G	P	X		7
1000	8									h	q	y		H	Q	Y		8
1001	9									i	r	z		I	R	Z		9
1010	A					¢	!		:									
1011	B					.	Pts	,	Ñ									
1100	C					<	*	%	@									
1101	D					(	)	_	'									
1110	E					+	;	>	=									
1111	F						┘	?	~									

Notes:

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the character that will be displayed or printed is a hyphen; hex code 60 will be returned on a subsequent read operation. The character displayed by the 3278 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. NL (hex 15), EM (hex 19), FF (hex 0C), and NUL (hex 00) are not displayed or printed. The DUP (hex 1C) and FM (hex 1E) control characters on dual-case terminals are respectively displayed as \* and ; and printed as \* and ;.
3. DUP (hex 1C) and FM (hex 1E) control characters on mono-case terminals are respectively displayed as \* and ; and printed as \* and ;.
4. The 3289, when operating in SCS mode, prints hyphens for both hex 1C and hex 1E.

Figure 5-17. Spanish (Alternate) I/O Interface Code (3274/3276/3278/3279/3287/3289)

		00				01				10				11				Bits
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	0,1
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	←2,3
Bits	Hex 1																	Hex 0
4567																		
0000	0					SP	&							{	}	\	0	
0001	1							/		a	j	..		A	J		1	
0010	2									b	k	s		B	K	S	2	
0011	3									c	l	t		C	L	T	3	
0100	4									d	m	u		D	M	U	4	
0101	5									e	n	v		E	N	V	5	
0110	6									f	o	w		F	O	W	6	
0111	7									g	p	x		G	P	X	7	
1000	8									h	q	y		H	Q	Y	8	
1001	9									i	r	z		I	R	Z	9	
1010	A					☐	☐	ñ	:									
1011	B					.	\$	,	Ñ									
1100	C					<	*	%	@									
1101	D					(	)	_	'									
1110	E					+	;	>	=									
1111	F						┘	?	"									

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the character that will be displayed or printed is a hyphen; hex code 60 will be returned on a subsequent read operation. The character displayed by the 3278 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. NL (hex 15), EM (hex 19), FF (hex 0C), and NUL (hex 00) are not displayed or printed. The DUP (hex 1C) and FM (hex 1E) control characters on dual-case terminals are respectively displayed as \* and ; and printed as \* and ;.
3. DUP (hex 1C) and FM (hex 1E) control characters on mono-case terminals are respectively displayed as \* and ; and printed as \* and ;.
4. The 3289, when operating in SCS mode, prints hyphens for both hex 1C and hex 1E.

**Figure 5-18. Spanish-Speaking I/O Interface Code (3274/3276/3278/3279/3287/3289)**

		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	← 2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	← Hex 0
0000	0					SP	&	-						{	}	\	0	
0001	1							/		a	j	-		A	J		1	
0010	2									b	k	s		B	K	S	2	
0011	3									c	l	t		C	L	T	3	
0100	4									d	m	u		D	M	U	4	
0101	5									e	n	v		E	N	V	5	
0110	6									f	o	w		F	O	W	6	
0111	7									g	p	x		G	P	X	7	
1000	8									h	q	y		H	Q	Y	8	
1001	9									i	r	z		I	R	Z	9	
1010	A					\$	!	!	:									
1011	B					.	£	,	#									
1100	C					<	*	%	@									
1101	D					(	)	-	'									
1110	E					+	;	>	=									
1111	F						⌋	?	..									

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the character that will be displayed or printed is a hyphen; hex code 60 will be returned on a subsequent read operation. The character displayed by the 3278 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. NL (hex 15), EM (hex 19), FF (hex 0C), and NUL (hex 00) are not displayed or printed. The DUP (hex 1C) and FM (hex 1E) control characters on dual-case terminals are respectively displayed as \* and ; and printed as \* and ; .
3. DUP (hex 1C) and FM (hex 1E) control characters on mono-case terminals are respectively displayed as \* and ; and printed as \* and ; .
4. The 3289, when operating in SCS mode, prints hyphens for both hex 1C and hex 1E.

**Figure 5-19. English (UK) I/O Interface Code (3274/3276/3278/3279/3287/3289)**



		00				01				10				11				Bits
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	0,1
Hex 1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	2,3
Bits	4567																	Hex 0
0000	0					SP	&	-						{	}	\	0	
0001	1							/		a	j	~		A	J		1	
0010	2									b	k	s		B	K	S	2	
0011	3									c	l	t		C	L	T	3	
0100	4									d	m	u		D	M	U	4	
0101	5									e	n	v		E	N	V	5	
0110	6									f	o	w		F	O	W	6	
0111	7									g	p	x		G	P	X	7	
1000	8									h	q	y		H	Q	Y	8	
1001	9								'	i	r	z		I	R	Z	9	
1010	A					¢	!		:					-				
1011	B					·	\$	,	#									
1100	C					<	*	%	@									
1101	D					(	)	_	'									
1110	E					+	;	>	=									
1111	F						┘	?	"									

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the character that will be displayed or printed is a hyphen ; hex code 60 will be returned on a subsequent read operation. The character displayed by the 3278 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. NL (hex 15), EM (hex 19), FF (hex 0C), and NUL (hex 00) are not displayed or printed. The DUP (hex 1C) and FM (hex 1E) control characters on dual-case terminals are respectively displayed as \* and ; and printed as \* and ; .
3. DUP (hex 1C) and FM (hex 1E) control characters on mono-case terminals are respectively displayed as \* and ; and printed as \* and ; .
4. The 3289, when operating in SCS mode, prints hyphens for both hex 1C and hex 1E.

**Figure 5-20. English (US) I/O Interface Code (3274/3276/3278/3279/3287/3289)**

					0	0	0	0	1	1	1	1
					0	0	1	1	0	0	1	1
					0	1	0	1	0	1	0	1
b <sub>4</sub>	b <sub>3</sub>	b <sub>2</sub>	b <sub>1</sub>	Hex 0	0	1	2	3	4	5	6	7
				Hex 1								
0	0	0	0	0			SP	0	@	P	-	p
0	0	0	1	1			!	1	A	Q	a	q
0	0	1	0	2			"	2	B	R	b	r
0	0	1	1	3			#	3	C	S	c	s
0	1	0	0	4			\$	4	D	T	d	t
0	1	0	1	5			%	5	E	U	e	u
0	1	1	0	6			&	6	F	V	f	v
0	1	1	1	7			'	7	G	W	g	w
1	0	0	0	8			(	8	H	X	h	x
1	0	0	1	9			)	9	I	Y	i	y
1	0	1	0	A			*	:	J	Z	j	z
1	0	1	1	B			+	;	K	[	k	{
1	1	0	0	C			,	<	L	\	l	
1	1	0	1	D			-	=	M	]	m	}
1	1	1	0	E			.	>	N	^	n	~
1	1	1	1	F			/	?	O	_	o	

**Notes:**

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the character that will be displayed or printed is a hyphen ; hex code 60 will be returned on a subsequent read operation. The character displayed by the 3278 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. NL (hex 15), EM (hex 19), FF (hex 0C), DUP (hex 1C), and FM (hex 1E) control characters are displayed or printed as 5, 9, <, \*, and ; characters, respectively, except by the printer under format control, in which case NL and EM do not result in the printing of a character.
3. Attribute, write control (WCC), copy control (CCC), CU and device address, buffer address, sense, and status characters are assigned so that each character can be represented by a graphic character within the solid outlined portion of this figure.
4. For 3277 units attached to a 3274 control unit, see Figure 4-15.
5. The 3289 does not support the ASCII transmission code.

Figure 5-21. English (US) ASCII-B I/O Interface Code (3274/3276/3278/3279/3287)

Bits 4567		00				01				10				11				Bits
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	←0,1
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	←2,3
		Hex 0																
0000	0									~	□	—	α	{	}		0	
0001	1					<u>A</u>	<u>J</u>		^	<b>▬</b>	<b>▬</b>	°	ε	(	)	1	1	
0010	2					<u>B</u>	<u>K</u>	<u>S</u>	••	<b>▬</b>	<b>▬</b>	—	ι	+	-	2	2	
0011	3					<u>C</u>	<u>L</u>	<u>T</u>		<b>▬</b>	<b>▬</b>	•	ρ	■	+	3	3	
0100	4					<u>D</u>	<u>M</u>	<u>U</u>		<b>▬</b>	<b>▬</b>	n	ω	L	J		4	
0101	5					<u>E</u>	<u>N</u>	<u>V</u>		<b>▬</b>	<b>▬</b>			Γ	⌋		5	
0110	6					<u>F</u>	<u>O</u>	<u>W</u>					x	┌	└		6	
0111	7					<u>G</u>	<u>P</u>	<u>X</u>					\	⊥	⊤		7	
1000	8					<u>H</u>	<u>Q</u>	<u>Y</u>	V				÷	§	¶		8	
1001	9					<u>I</u>	<u>R</u>	<u>Z</u>									9	
1010	A									↑	⊃	∩	∇	Α	I	/	·	
1011	B									↓	⊂	∪	Δ	∇	!	λ	∇	
1100	C									≤	≠	⊥	⊤		ψ		Δ	
1101	D									Γ	○	[	]	φ	⊠	⊖	⊖	
1110	E									L	±	≥	≠		⊠	⊠	⊠	
1111	F									→	←	°	l	⊙	⊙	⊙		

**Notes:**

1. These codes, preceded by a hex 08 (Graphic Escape) control character, transmit the graphics shown.
2. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the character that will be displayed or printed is a hyphen ; hex code 60 will be returned on a subsequent read operation. The character displayed by the 3278 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
3. The 10 graphic plot characters within the bold-outlined area cannot be entered from either the APL or the Text keyboard.



Figure 5-22. APL/Text Feature, Two-Byte I/O Interface Code (3274, 3278, 3279, 3287-1 or -2)

Bits 4567	Hex 1 ↓	00				01				10				11				
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
0000	0					SP	&	-				-	0	{	}	\	0	
0001	1							/		a	j	~°	1	A	J		1	
0010	2									b	k	s	2	B	K	S	2	
0011	3									c	l	t	3	C	L	T	3	
0100	4									d	m	u	4	D	M	U	4	
0101	5									e	n	v	5	E	N	V	5	
0110	6									f	o	w	6	F	O	W	6	
0111	7									g	p	x	7	G	P	X	7	
1000	8									h	q	y	8	H	Q	Y	8	
1001	9										i	r	z	9	I	R	Z	9
1010	A					ç	!		:									
1011	B					.	\$	,	#	{	}	L	J					
1100	C					<	•	%	@	≦	≧	Γ	∟					
1101	D					(	)	_	·	(	)	[	]					
1110	E					+	;	>	=	+	±	≥						
1111	F						∟	?	"	+	■	•	-					

Bits  
0.1  
2.3  
Hex 0

**Legend:**

 Superscript

**Note:** Character code hex A1 causes a ° (degree) character to print when the 3289 Text Print belt is installed, and a ~ character when a U.S. English 3289 print belt is installed.

**Figure 5-23. 3289 Text Print Feature I/O Interface Code**

		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0					SP	&	-						NU 10	NU 11	NU 12	0	
0001	1							/		a	j	NU9		A	J		1	
0010	2									b	k	s		B	K	S	2	
0011	3									c	l	t		C	L	T	3	
0100	4									d	m	u		D	M	U	4	
0101	5									e	n	v		E	N	V	5	
0110	6									f	o	w		F	O	W	6	
0111	7									g	p	x		G	P	X	7	
1000	8									h	q	y		H	Q	Y	8	
1001	9								NU4	i	r	z		I	R	Z	9	
1010	A					NU1	NU2	NU3	:									
1011	B					·	NU5	'	NU6									
1100	C					<	*	%	NU7									
1101	D					(	)	-	'									
1110	E					+	;	>	=									
1111	F					NU 13	NU8	?	NU 14									

Note: National-use differences are shown in Part 2 of this figure.

Figure 5-24 (Part 1 of 2). National Use (NU) Differences I/O Interface Code (3274/3276/3278/3279/3287/3289)

National Use Number I/O Hex Code	1 4A	2 5A	3 6A	4 79	5 5B	6 7B	7 7C	8 5F	9 A1	10 C0	11 D0	12 E0	13 4F	14 7F
Controller Language Device														
U.S. EBCDIC	¢			'	\$	#	@	¬	~	{	}	\		"
Austrian/German	Ä	Ü	ö	'	\$	#	§	^	β	ä	ü	Ö	!	"
Austrian/German (Alternate)		ö	ü	β		Ü	Ä	Ö	¬					ä
Belgian	[	]	ù	'	\$	#	'a	^	..	e'	'e	ç	!	"
Brazilian	É	\$	ç	ã	ç	Õ	Ã	^	~	õ	e'	\	!	"
Canadian French	à	'	ù	'	\$	#	@	^	..	e'	'e	ç	!	"
Danish/Norwegian	#	x	φ	'	Å	Æ	Ø	^	ü	æ	g	\	!	"
Danish/Norwegian (Alternate)	φ	a			Å	Æ	Ø	¬						æ
Finnish/Swedish	§	x	ö	e'	Å	Ä	Ö	^	ü	ä	g	É	!	"
Finnish/Swedish (Alternate)	ö	g			Å	Ä	Ö	¬						ä
French	o	§	ù	'	\$	£	'a	^	..	e'	'e	ç	!	"
International	[	]		'	\$	#	@	^	~	{	}		!	"
Italian	o	e'	ò	ù	\$	£	§	^	'i	'a	'e	ç	!	"
Japanese/English	£	!		'	¥	#	@	¬		{	}	\$		"
Portuguese	[	]	õ	'	\$	Ã	Õ	^	ç	ã	/	ç	!	"
Spanish	[	]	ñ	'	Pt	Ñ	@	¬	..	{	}	\		"
Spanish (Alternate)	ç	!			Pt	Ñ	@	¬						ñ
Spanish-Speaking	[	]	ñ	'	\$	Ñ	@	¬	..	{	}	\		"
U.K.	\$	!		'	£	#	@	¬	-	{	}	\		"

Figure 5-24 (Part 2 of 2). National Use (NU) Differences I/O Interface Code (3274/3276/3278/3279/3287/3289)

Character	Codes to 3274	I/O Codes to Host	
	Hex	EBCDIC	ASCII
0	0	F0	30
1	1	F1	31
2	2	F2	32
3	3	F3	33
4	4	F4	34
5	5	F5	35
6	6	F6	36
7	7	F7	37
8	8	F8	38
9	9	F9	39
Space	D	40	20

**Note:** The hex codes shown are those that can be used in the magnetic-stripe data section.

**Figure 5-25. Numeric Character Set I/O Interface Code**




Character	Codes to 3274		I/O Codes to Host	
	Hex		EBCDIC	ASCII
0	0A	See Note 5  See Note 5	F0	30
1	1A		F1	31
2	2A		F2	32
3	3A		F3	33
4	4A		F4	34
5	5A		F5	35
6	6A		F6	36
7	7A		F7	37
8	8A		F8	38
9	9A		F9	39
00	00		F0, F0	30, 30
01	01		F0, F1	30, 31
02	02		F0, F2	30, 32
↑			↑	
↓			↓	
97	97		F9, F7	39, 37
98	98		F9, F8	39, 38
99	99		F9, F9	39, 39
A	C1		C1	41
B	C2		C2	42
C	C3		C3	43
D	C4		C4	44
E	C5		C5	45
F	C6		C6	46
G	C7		C7	47
H	C8		C8	48
I	C9		C9	49
J	D1		D1	4A
K	D2		D2	4B
L	D3		D3	4C
M	D4		D4	4D
N	D5		D5	4E
O	D6		D6	4F
P	D7		D7	50
Q	D8		D8	51
R	D9		D9	52
S	F2		E2	53
T	E3		E3	54
U	E4		E4	55
V	E5		E5	56
W	E6		E6	57
X	E7		E7	58
Y	E8		E8	59
Z	E9		E9	5A
␣	0C		4A	5B (I)
!	1C		5A	5D (I)
:	3C		7A	3A
<	4C		4C	3C
*	5C		5C	2A
%	6C		6C	25
@	7C		7C	40
.	0D		4B	2E
\$	1D		5B	24
,	2D		6B	2C
#	3D		7B	23
(	4D		4D	28
)	5D		5D	29
-	6D		6D	5F
'	7D		7D	27
	0E		4F	21 (I)

Figure 5-26 (Part 1 of 2). Alphanumeric Character Set I/O Interface Code

Character	Codes to 3274	I/O Codes to Host	
	Hex	EBCDIC	ASCII
¬	1E	5F	5E ( ^ )
?	2E	6F	3F
"	3E	7F	22
+	4E	4E	2B
:	5E	5E	3B
>	6E	6E	3E
=	7E	7E	3D
\	E0	E0	5C
/	E1	61	2F
&	DA	50	26
-	EA	60	2D
Space	CA	40	20

**Notes:**

1. The hex codes shown are those that can be used in the magnetic-stripe data section.
2. The MSR/MHS character codes listed are U.S. EBCDIC/ASCII codes only. For the graphic-character equivalents of the EBCDIC/ASCII codes for other countries, refer to the appropriate national code chart of the A/FE or E/ME/A country desired or to the National Use (NU) Differences I/O Interface Code chart (Figure 5-24).
3. For 1970 Austria/Germany, Denmark, Finland, Norway, Spain, and Sweden MSR language tables, a card encoded with hex E0 is rejected.
4. For 1970 Portugal MSR language table, a card encoded with hex 4C is rejected.
5. Numeric characters are coded in 4-bit pairs. As a result, there must be either an even number of numeric characters in any continuous string of numerics or an odd number of numerics with a filler character. Hex A (1010) is used as the filler character. For example: the code sequence for 12XYZ is hex 12E7E8E9; the code sequence for 123XYZ is hex 123AE7E8E9. This limits the number of characters to 62 alphabetic and special characters and 124 numeric characters.

**Figure 5-26 (Part 2 of 2). Alphameric Character Set I/O Interface Code**



## Chapter 6. 3274/3277 I/O Interface Codes

This chapter contains all the I/O interface codes (Figures 6-1 through 6-21) that support the 3277 Display Station keyboards when used in conjunction with the 3274 Control Unit of the 3270 Information Display System. Included is a national use differences table (Figure 6-21) that illustrates the differences in I/O interface codes for the various national languages that are supported by the 3270 Information Display System. The interface codes both for the United States and for World Trade countries are presented in alphabetical order.

Hex 1 Bits 4567		00				01				10				11				Bits 0,1			
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	← 2,3			
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	← Hex 0			
0000	0					SP	&	-										ä	ü	ö	0
0001	1							/		a	j	β		A	J						1
0010	2									b	k	s		B	K	S					2
0011	3									c	l	t		C	L	T					3
0100	4									d	m	u		D	M	U					4
0101	5									e	n	v		E	N	V					5
0110	6									f	o	w		F	O	W					6
0111	7									g	p	x		G	P	X					7
1000	8									h	q	y		H	Q	Y					8
1001	9											'						i	r	z	9
1010	A					Ä	Ü	ö	:												
1011	B					.	%	,	+												
1100	C					<	*	%	?												
1101	D					(	)	_	'												
1110	E					+	;	>	=												
1111	F						⌂	?	=												

Legend:















-  Stored as lowercase. Displayed as lowercase on dual-case station; displayed as uppercase on mono-case display station.
-  Stored as a lowercase symbol. Displayed on mono-case display station. Cannot be entered from the keyboard.
-  Stored as shown. Displayed as shown on mono-case display station. Displayed as lowercase accented character on dual-case display station and as shown in Figure 5-24. May be entered from the keyboard.
-  Displayed on dual-case display station only.
-  or  Cannot be entered from the keyboard or displayed.
-  Invalid I/O code point. Stored and displayed as - (hyphen). Hex 60 returned over I/O.

Figure 6-1. Austrian/German I/O Interface Code (3274/3277)

		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	←2,3
Hex 1 Bits 4567		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	←Hex 0
0000	0					SP	&	-										0
0001	1							/		a	j			A	J			1
0010	2									b	k	s		B	K	S		2
0011	3									c	l	t		C	L	T		3
0100	4									d	m	u		D	M	U		4
0101	5									e	n	v		E	N	V		5
0110	6									f	o	w		F	O	W		6
0111	7									g	p	x		G	P	X		7
1000	8									h	q	y		H	Q	Y		8
1001	9									i	r	z		I	R	Z		9
1010	A					ö	ü	ß	:									
1011	B					·	Û	,	Ä									
1100	C					<	*	%	Ö									
1101	D					(	)	-	'									
1110	E					+	;	>	=									
1111	F						⌋	?	ä									

**Legend:**

-  Stored as lowercase. Displayed as lowercase on dual-case display station; displayed as uppercase on mono-case display station.
-  Stored as a lowercase symbol. Displayed on mono-case display station. Cannot be entered from the keyboard.
-  Stored as shown. Displayed as shown on mono-case display station. Displayed as lowercase accented character on dual-case display station and as shown in Figure 5-24. May be entered from the keyboard.
-  Displayed on dual-case display station only.
-  or  Cannot be entered from the keyboard or displayed.
-  Invalid I/O code point. Stored and displayed as - (hyphen). Hex 60 returned over I/O.

**Figure 6-2. Austrian/German (Alternate) I/O Interface Code (3274/3277)**

		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3
Hex 1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0					SP	&	-	ı					AA	6A	ç	0	
0001	1							/		a	j	"		A	J		1	
0010	2									b	k	s		B	K	S	2	
0011	3									c	l	t		C	L	T	3	
0100	4									d	m	u		D	M	U	4	
0101	5									e	n	v		E	N	V	5	
0110	6									f	o	w		F	O	W	6	
0111	7									g	p	x		G	P	X	7	
1000	8									h	q	y		H	Q	Y	8	
1001	9									i	r	z		I	R	Z	9	
1010	A					ç	!	-	:									
1011	B					.	\$	,	#									
1100	C					<	*	%	@									
1101	D					(	)	_	'									
1110	E					+	;	>	=									
1111	F						ı	?	"									

Legend:






-  Stored as lowercase. Displayed as lowercase on dual-case display station; displayed as uppercase on mono-case display station.
-  Stored as a lowercase symbol. Displayed on mono-case display station. Cannot be entered from the keyboard.
-  Stored as shown. Displayed on mono-case display station. Displayed as lowercase accented character on dual-case display station and as shown in Figure 5-24. May be entered from the keyboard.
-  Displayed on dual-case display station only.
- 6A or AA Cannot be entered from the keyboard or displayed.
-  Invalid I/O code point. Stored and displayed as - (hyphen). Hex 60 returned over I/O.

Figure 6-3. Belgian I/O Interface Code (3274/3277)

		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3
Hex 1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0					SP	&	-						ç	AA		0	
0001	1							/		a	j	-		A	J		1	
0010	2									b	k	s		B	K	S	2	
0011	3									c	l	t		C	L	T	3	
0100	4									d	m	u		D	M	U	4	
0101	5									e	n	v		E	N	V	5	
0110	6									f	o	w		F	O	W	6	
0111	7									g	p	x		G	P	X	7	
1000	8									h	q	y		H	Q	Y	8	
1001	9								ã	i	r	z		I	R	Z	9	
1010	A					6A	%	ç	:									
1011	B					.	ç	,	õ									
1100	C					<	*	%	ã									
1101	D					(	)	-	'									
1110	E					+	;	>	=									
1111	F						ç	?	'									

Legend:















-  Stored as lowercase. Displayed as lowercase on dual-case display station; displayed as uppercase on mono-case display station.
-  Stored as a lowercase symbol. Displayed on mono-case display station. Cannot be entered from the keyboard.
-  Stored as shown. Displayed as shown on mono-case display station. Displayed as lowercase accented character on dual-case display station and as shown in Figure 5-24. May be entered from the keyboard.
-  Displayed on dual-case display station only.
-  or  Cannot be entered from the keyboard or displayed.
-  Invalid I/O code point. Stored and displayed as - (hyphen). Hex 60 returned over I/O.

Figure 6-4. Brazilian/Portuguese I/O Interface Code (3274/3277)



		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3
Hex 1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0					SP	&	-						AA	6A	,	0	
0001	1						/			a	j	"		A	J		1	
0010	2									b	k	s		B	K	S	2	
0011	3									c	l	t		C	L	T	3	
0100	4									d	m	u		D	M	U	4	
0101	5									e	n	v		E	N	V	5	
0110	6									f	o	w		F	O	W	6	
0111	7									g	p	x		G	P	X	7	
1000	8									h	q	y		H	Q	Y	8	
1001	9									i	r	z		I	R	Z	9	
1010	A					¢	—	!	:									
1011	B					.	\$	,	#									
1100	C					<	*	%	@									
1101	D					(	)	_	'									
1110	E					+	;	>	=									
1111	F						⌋	?	"									

**Legend:**

-  Stored as lowercase. Displayed as lowercase on dual-case display station; displayed as uppercase on mono-case display station.
-  Stored as a lowercase symbol. Displayed on mono-case display station. Cannot be entered from the keyboard.
-  Stored as shown. Displayed as shown on mono-case display station. Displayed as lowercase accented character on dual-case display station and as shown in Figure 5-24. May be entered from the keyboard.
-  Displayed on dual-case display station only.
-  or  Cannot be entered from the keyboard or displayed.
-  Invalid I/O code point. Stored and displayed as - (hyphen). Hex 60 returned over I/O.

**Figure 6-5. Canadian (French) I/O Interface Code (3274/3277)**

Hex 1 Bits 4567		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0					SP	&	-						æ	å		0	
0001	1							/		a	j	-		A	J		1	
0010	2									b	k	s		B	K	S	2	
0011	3									c	l	t		C	L	T	3	
0100	4									d	m	u		D	M	U	4	
0101	5									e	n	v		E	N	V	5	
0110	6									f	o	w		F	O	W	6	
0111	7									g	p	x		G	P	X	7	
1000	8									h	q	y		H	Q	Y	8	
1001	9									i	r	z		I	R	Z	9	
1010	A					+	AA	φ	:									
1011	B					.	Å	,	Æ									
1100	C					<	*	%	Ø									
1101	D					(	)	-	'									
1110	E					+	;	>	=									
1111	F						⌞	?	6A									

Legend:







-  Stored as lowercase. Displayed as lowercase on dual-case display station; displayed as uppercase on mono-case display station.
-  Stored as a lowercase symbol. Displayed on mono-case display station. Cannot be entered from the keyboard.
-  Stored as shown. Displayed as shown on mono-case display station. Displayed as lowercase accented character on dual-case display station and as shown in Figure 5-24. May be entered from the keyboard.
-  Displayed on dual-case display station only.
-  6A or AA Cannot be entered from the keyboard or displayed.
-  Invalid I/O code point. Stored and displayed as - (hyphen). Hex 60 returned over I/O.

Figure 6-6. Danish/Norwegian I/O Interface Code (3274/3277)

Hex 1 Bits 4567		00				01				10				11				Bits 0,1			
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3			
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0			
0000	0					SP	&	-													0
0001	1							/		a	j			A	J						1
0010	2									b	k	s		B	K	S					2
0011	3									c	l	t		C	L	T					3
0100	4									d	m	u		D	M	U					4
0101	5									e	n	v		E	N	V					5
0110	6									f	o	w		F	O	W					6
0111	7									g	p	x		G	P	X					7
1000	8									h	q	y		H	Q	Y					8
1001	9									i	r	z		I	R	Z					9
1010	A					ø	ø	6A	:												
1011	B					.	Å	.	Æ												
1100	C					<	*	%	Ø												
1101	D					(	)	-	'												
1110	E					+	;	>	=												
1111	F						⌞	?	æ												

Legend:








-  Stored as lowercase. Displayed as lowercase on dual-case display station; displayed as uppercase on mono-case display station.
-  Stored as a lowercase symbol. Displayed on mono-case display station. Cannot be entered from the keyboard.
-  Stored as shown. Displayed as shown on mono-case display station. Displayed as lowercase accented character on dual-case display station and as shown in Figure 5-24. May be entered from the keyboard.
-  Displayed on dual-case display station only.
-  or  Cannot be entered from the keyboard or displayed.
-  Invalid I/O code point. Stored and displayed as - (hyphen). Hex 60 returned over I/O.

Figure 6-7. Danish/Norwegian (Alternate) I/O Interface Code (3274/3277)

Hex 1 Bits 4567		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0
0000	0					SP	&	-							ä	å	6A	0
0001	1						/			a	j	-			A	J		1
0010	2									b	k	s			B	K	S	2
0011	3									c	l	t			C	L	T	3
0100	4									d	m	u			D	M	U	4
0101	5									e	n	v			E	N	V	5
0110	6									f	o	w			F	O	W	6
0111	7									g	p	x			G	P	X	7
1000	8									h	q	y			H	Q	Y	8
1001	9								AA	i	r	z			I	R	Z	9
1010	A					%	+	ö	:									
1011	B					.	Å	.	Ä									
1100	C					<	*	%	Ö									
1101	D					(	)	-	'									
1110	E					+	;	>	=									
1111	F						⌋	?	'									

Legend:






-  Stored as lowercase. Displayed as lowercase on dual-case display station; displayed as uppercase on mono-case display station.
-  Stored as a lowercase symbol. Displayed on mono-case display station. Cannot be entered from the keyboard.
-  Stored as shown. Displayed as shown on mono-case display station. Displayed as lowercase accented character on dual-case display station and as shown in Figure 5-24. May be entered from the keyboard.
-  Displayed on dual-case display station only.
- 6A or AA Cannot be entered from the keyboard or displayed.
-  Invalid I/O code point. Stored and displayed as - (hyphen). Hex 60 returned over I/O.

Figure 6-8. Finnish/Swedish I/O Interface Code (3274/3277)

Hex 1 Bits 4567		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	← 2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	← Hex 0
0000	0					SP	&	-										0
0001	1							/		a	j			A	J			1
0010	2									b	k	s		B	K	S		2
0011	3									c	l	t		C	L	T		3
0100	4									d	m	u		D	M	U		4
0101	5									e	n	v		E	N	V		5
0110	6									f	o	w		F	O	W		6
0111	7									g	p	x		G	P	X		7
1000	8									h	q	y		H	Q	Y		8
1001	9									i	r	z		I	R	Z		9
1010	A					ö	å	6A	:									
1011	B					.	Å	,	Ä									
1100	C					<	*	%	Ö									
1101	D					(	)	-	'									
1110	E					+	;	>	=									
1111	F						⌋	?	ä									

Legend:






-  Stored as lowercase. Displayed as lowercase on dual-case display station; displayed as uppercase on mono-case display station.
-  Stored as a lowercase symbol. Displayed on mono-case display station. Cannot be entered from the keyboard.
-  Stored as shown. Displayed as shown on mono-case display station. Displayed as lowercase accented character on dual-case display station and as shown in Figure 5-24. May be entered from the keyboard.
-  Displayed on dual-case display station only.
- 6A or AA Cannot be entered from the keyboard or displayed.
-  Invalid I/O code point. Stored and displayed as - (hyphen). Hex 60 returned over I/O.

Figure 6-9. Finnish/Swedish (Alternate) I/O Interface Code (3274/3277)

Hex 1 Bits 4567		00				01				10				11				Bits 0,1			
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3			
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0			
0000	0					SP	&	-										#	!	ç	0
0001	1							/		a	j	AA						A	J	.	1
0010	2									b	k	s						B	K	S	2
0011	3									c	l	t						C	L	T	3
0100	4									d	m	u						D	M	U	4
0101	5									e	n	v						E	N	V	5
0110	6									f	o	w						F	O	W	6
0111	7									g	p	x						G	P	X	7
1000	8									h	q	y						H	Q	Y	8
1001	9									i	r	z						I	R	Z	9
1010	A					6A	?	"	:												
1011	B					.	\$	,	#												
1100	C					<	*	%	@												
1101	D					(	)	_	'												
1110	E					+	;	>	=												
1111	F						⌋	?	"												

Legend:








-  Stored as lowercase. Displayed as lowercase on dual-case display station; displayed as uppercase on mono-case display station.
-  Stored as a lowercase symbol. Displayed on mono-case display station. Cannot be entered from the keyboard.
-  Stored as shown. Displayed as shown on mono-case display station. Displayed as lowercase accented character on dual-case display station and as shown in Figure 5-24. May be entered from the keyboard.
-  Displayed on dual-case display station only.
-  or  Cannot be entered from the keyboard or displayed.
-  Invalid I/O code point. Stored and displayed as - (hyphen). Hex 60 returned over I/O.

Figure 6-10. French I/O Interface Code (3274/3277)

Hex 1 Bits 4567		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	←2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	←Hex 0
0000	0					SP	&	-						ç	!	ç	0	
0001	1							/		a	j	#		A	J		1	
0010	2									b	k	s		B	K	S	2	
0011	3									c	l	t		C	L	T	3	
0100	4									d	m	u		D	M	U	4	
0101	5									e	n	v		E	N	V	5	
0110	6									f	o	w		F	O	W	6	
0111	7									g	p	x		G	P	X	7	
1000	8									h	q	y		H	Q	Y	8	
1001	9							"		i	r	z		I	R	Z	9	
1010	A					6A	AA	@	:									
1011	B					.	\$	,	#									
1100	C					<	*	%	?									
1101	D					(	)	_	'									
1110	E					+	;	>	=									
1111	F						⌋	?	"									

Legend:






-  Stored as lowercase. Displayed as lowercase on dual-case display station; displayed as uppercase on mono-case display station.
-  Stored as a lowercase symbol. Displayed on mono-case display station. Cannot be entered from the keyboard.
-  Stored as shown. Displayed as shown on mono-case display station. Displayed as lowercase accented character on dual-case display station and as shown in Figure 5-24. May be entered from the keyboard.
-  Displayed on dual-case display station only.
- 6A or AA Cannot be entered from the keyboard or displayed.
-  Invalid I/O code point. Stored and displayed as - (hyphen). Hex 60 returned over I/O.

Figure 6-11. Italian I/O Interface Code (3274/3277)

Bits 4567	Hex 1	00				01				10				11				Bits 0,1	
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	2,3	
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0	
0000	0					SP	&	-								(	)	\	0
0001	1						/			a	j	-				A	J		1
0010	2									b	k	s				B	K	S	2
0011	3									c	l	t				C	L	T	3
0100	4									d	m	u				D	M	U	4
0101	5									e	n	v				E	N	V	5
0110	6									f	o	w				F	O	W	6
0111	7									g	p	x				G	P	X	7
1000	8									h	q	y				H	Q	Y	8
1001	9									i	r	z				I	R	Z	9
1010	A					[	]	6A	:										
1011	B					.	\$	,	#										
1100	C					<	*	%	@										
1101	D					(	)	-	'										
1110	E					+	;	>	=										
1111	F					!	^	?	"										

**Legend:**








-  Stored as lowercase. Displayed as lowercase on dual-case display station; displayed as uppercase on mono-case display station.
-  Stored as a lowercase symbol. Displayed on mono-case display station. Cannot be entered from the keyboard.
-  Stored as shown. Displayed as shown on mono-case display station. Displayed as lowercase accented character on dual-case display station and as shown in Figure 5-24. May be entered from the keyboard.
-  Displayed on dual-case display station only.
-  or  Cannot be entered from the keyboard or displayed.
-  Invalid I/O code point. Stored and displayed as - (hyphen). Hex 60 returned over I/O.

Figure 6-12. International I/O Interface Code (3274/3277)



Hex 1 Bits 4567		00				01				10				11				Bits 0,1			
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3			
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0			
0000	0					SP	&	-										(	)	\$	0
0001	1							/			a	j	-					A	J		1
0010	2										b	k	s					B	K	S	2
0011	3										c	l	t					C	L	T	3
0100	4										d	m	u					D	M	U	4
0101	5										e	n	v					E	N	V	5
0110	6										f	o	w					F	O	W	6
0111	7										g	p	x					G	P	X	7
1000	8										h	q	y					H	Q	Y	8
1001	9										i	r	z					I	R	Z	9
1010	A					#	!	6A	:												
1011	B					.	¢	,	#												
1100	C					<	*	%	@												
1101	D					(	)	-	'												
1110	E					+	;	>	=												
1111	F						┘	?	"												

Legend:









-  Stored as lowercase. Displayed as lowercase on dual-case display station; displayed as uppercase on mono-case display station.
-  Stored as a lowercase symbol. Displayed on mono-case display station. Cannot be entered from the keyboard.
-  Stored as shown. Displayed as shown on mono-case display station. Displayed as lowercase accented character on dual-case display station and as shown in Figure 5-24. May be entered from the keyboard.
-  Displayed on dual-case display station only.
-  6A or  AA Cannot be entered from the keyboard or displayed.
-  Invalid I/O code point. Stored and displayed as - (hyphen). Hex 60 returned over I/O.

Figure 6-13. Japanese (English) I/O Interface Code (3274/3277)

Hex	Bits 4567	00				01				10				11				First Hex Char. Bits 0,1 ←0,1 ←2,3 Hex 0
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
0000	0					SP	&	-			ソ					\$	0	
0001	1					。	エ	/		ア	タ	ー		A	J		1	
0010	2					「	オ			イ	チ	ハ		B	K	S	2	
0011	3					」	パ			ウ	ツ	ホ		C	L	T	3	
0100	4					、	ユ			エ	テ	マ		D	M	U	4	
0101	5					・	ヨ			オ	ト	ミ		E	N	V	5	
0110	6					ヲ	ツ			カ	オ	ム		F	O	W	6	
0111	7					ア				キ	ニ	メ		G	P	X	7	
1000	8					イ	-			ク	ヌ	モ		H	Q	Y	8	
1001	9					ウ				ケ	ネ	ハ		I	R	Z	9	
1010	A					£	!		:	コ	ノ	工	レ					
1011	B					.	¥	,	#				□					
1100	C					<	*	%	@	サ		ヨ	ワ					
1101	D					(	)	_	'	シ	ハ	ラ	ン					
1110	E					+	;	>	=	ス	ヒ	リ	〃					
1111	F						〒	?		セ	フ	ル	。					

Legend:

 Cannot be entered from the keyboard or displayed.

Notes:

1. Character code (hex 40 through hex FF) assignments other than those shown are undefined. If an undefined character code is programmed, the character that will be displayed or printed is a hyphen; hex code 60 will be returned on a subsequent read operation. The character displayed by the 3277 for a given undefined character code may be different for other devices. IBM reserves the right to change, at any time, the character displayed for an undefined character code.
2. NL (hex 15), EM (hex 19), FF (hex 0C), and NUL (hex 00) are not displayed or printed. The DUP (hex 1C) and FM (hex 1E) control characters on dual case featured terminals are respectively displayed as \* and ; and printed as \* and ;.
3. DUP (hex 1C) and FM (hex 1E) control characters on mono-case terminals are respectively displayed as \* and ; and printed as \* and ;.
4. When 3277, 3284, 3286, 3287ANR, and 3288 are attached to the 3274, Notes 2 and 3 do not apply. NC (hex 15) is displayed as a . and EM (hex 19) is displayed as a 9.

Figure 6-14. Japanese (Katakana) I/O Interface Code (3274/3277)

Bits 4567	Hex 1	00				01				10				11				Bits 0,1	
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	←2,3	
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	←Hex 0	
0000	0					SP	&	-								ã	—	ç	0
0001	1						/			a	j	ç				A	J		1
0010	2									b	k	s				B	K	S	2
0011	3									c	l	t				C	L	T	3
0100	4									d	m	u				D	M	U	4
0101	5									e	n	v				E	N	V	5
0110	6									f	o	w				F	O	W	6
0111	7									g	p	x				G	P	X	7
1000	8									h	q	y				H	Q	Y	8
1001	9									i	r	z				I	R	Z	9
1010	A					(	)	õ	:										
1011	B					.	6A	,	Ã										
1100	C					<	*	%	õ										
1101	D					(	)	-	'										
1110	E					+	;	>	=										
1111	F						⌋	?	AA										

Legend:








-  Stored as lowercase. Displayed as lowercase on dual-case display station; displayed as uppercase on mono-case display station.
-  Stored as a lowercase symbol. Displayed on mono-case display station. Cannot be entered from the keyboard.
-  Stored as shown. Displayed as shown on mono-case display station. Displayed as lowercase accented character on dual-case display station and as shown in Figure 5-24. May be entered from the keyboard.
-  Displayed on dual-case display station only.
-  or  Cannot be entered from the keyboard or displayed.
-  Invalid I/O code point. Stored and displayed as - (hyphen). Hex 60 returned over I/O.

Figure 6-15. Portuguese I/O Interface Code (3274/3277)

Bits 4567	Hex 1 ↓	00				01				10				11			
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0000	0					SP	&	.	.								
0001	1							/		a	j	6A	ñ	ñ			
0010	2									b	k						
0011	3									c	l						
0100	4									e	m						
0101	5									a	n						
0110	6									f	o						
0111	7									g	p						
1000	8									h	q						
1001	9									i	r						
1010	A					s	i	ñ	:								
1011	B					.	pi	.	ñ								
1100	C					<	'	&	@								
1101	D					(	)	_	'								
1110	E					+	:	>	=								
1111	F						~	?	AA								

**Legend:**






-  Stored as lowercase. Displayed as lowercase on dual-case display station; displayed as uppercase on mono-case display station.
-  Stored as a lowercase symbol. Displayed on mono-case display station. Cannot be entered from the keyboard.
-  Stored as shown. Displayed as shown on mono-case display station. Displayed as lowercase on dual-case display station and as shown in Figure 5-24. May be entered from the keyboard.
-  Displayed on dual-case display station only.
- 6A or AA Cannot be entered from the keyboard or displayed.
-  Invalid I/O code point. Stored and displayed as - (hyphen). Hex 00 reserved over I/O.

Figure 6-16. Spanish I/O Interface Code (3274/3277)

Hex 1 Bits 4567	Hex 0	00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	← 2,3
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	← Hex 0
0000	0					SP	&	-										0
0001	1							/		a	j			A	J		1	
0010	2									b	k	s		B	K	S	2	
0011	3									c	l	t		C	L	T	3	
0100	4									d	m	u		D	M	U	4	
0101	5									e	n	v		E	N	V	5	
0110	6									f	o	w		F	O	W	6	
0111	7									g	p	x		G	P	X	7	
1000	8									h	q	y		H	Q	Y	8	
1001	9									i	r	z		I	R	Z	9	
1010	A					¢	!	6A	:									
1011	B					.	Pt	,	Ñ									
1100	C					<	*	%	@									
1101	D					(	)	_	'									
1110	E					+	;	>	=									
1111	F						⌋	?	ñ									

Legend:








-  Stored as lowercase. Displayed as lowercase on dual-case display station; displayed as uppercase on mono-case display station.
-  Stored as a lowercase symbol. Displayed on mono-case display station. Cannot be entered from the keyboard.
-  Stored as shown. Displayed as shown on mono-case display station. Displayed as lowercase accented character on dual-case display station and as shown in Figure 5-24. May be entered from the keyboard.
-  Displayed on dual-case display station only.
-  or  Cannot be entered from the keyboard or displayed.
-  Invalid I/O code point. Stored and displayed as - (hyphen). Hex 60 returned over I/O.

Figure 6-17. Spanish (Alternate) I/O Interface Code (3274/3277)

Hex 1 Bits 4567		00				01				10				11				Bits 0,1			
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3			
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0			
0000	0					SP	&	-										(	)		0
0001	1							/		a	j	6A		A	J						1
0010	2									b	k	s		B	K	S					2
0011	3									c	l	t		C	L	T					3
0100	4									d	m	u		D	M	U					4
0101	5									e	n	v		E	N	V					5
0110	6									f	o	w		F	O	W					6
0111	7									g	p	x		G	P	X					7
1000	8									h	q	y		H	Q	Y					8
1001	9									i	r	z		I	R	Z					9
1010	A					ç	!	ñ	:												
1011	B					.	Pt	,	Ñ												
1100	C					<	*	%	@												
1101	D					(	)	_	'												
1110	E					+	;	>	=												
1111	F						¡	?	AA												

Legend:








-  Stored as lowercase. Displayed as lowercase on dual-case display station; displayed as uppercase on mono-case display station.
-  Stored as a lowercase symbol. Displayed on mono-case display station. Cannot be entered from the keyboard.
-  Stored as shown. Displayed as shown on mono-case display station. Displayed as lowercase accented character on dual-case display station and as shown in Figure 5-24. May be entered from the keyboard.
-  Displayed on dual-case display station only.
-  or  Cannot be entered from the keyboard or displayed.
-  Invalid I/O code point. Stored and displayed as - (hyphen). Hex 60 returned over I/O.

Figure 6-18. Spanish-Speaking I/O Interface Code (3274/3277)

		00				01				10				11				Bits	
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	0,1	
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	2,3	
Hex 1	Hex 0																	Hex 0	
0000	0					SP	&	-								(	)		0
0001	1							/		a	j	AA				A	J		1
0010	2									b	k	s				B	K	S	2
0011	3									c	l	t				C	L	T	3
0100	4									d	m	u				D	M	U	4
0101	5									e	n	v				E	N	V	5
0110	6									f	o	w				F	O	W	6
0111	7									g	p	x				G	P	X	7
1000	8									h	q	y				H	Q	Y	8
1001	9									i	r	z				I	R	Z	9
1010	A					\$	!	6A	:										
1011	B					.	£	,	#										
1100	C					<	*	%	@										
1101	D					(	)	_	'										
1110	E					+	;	>	=										
1111	F						⌋	?	"										

Legend:








-  Stored as lowercase. Displayed as lowercase on dual-case display station; displayed as uppercase on mono-case display station.
-  Stored as a lowercase symbol. Displayed on mono-case display station. Cannot be entered from the keyboard.
-  Stored as shown. Displayed as shown on mono-case display station. Displayed as lowercase accented character on dual-case display station and as shown in Figure 5-24. May be entered from the keyboard.
-  Displayed on dual-case display station only.
-  or  Cannot be entered from the keyboard or displayed.
-  Invalid I/O code point. Stored and displayed as - (hyphen). Hex 60 returned over I/O.

Figure 6-19. English (UK) I/O Interface Code (3274/3277)

		00				01				10				11				Bits 0,1
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	← 2,3
Hex 1 Bits 4567		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	← Hex 0
0000	0					SP	&	-						(	)	AA	0	
0001	1							/		a	j	-		A	J		1	
0010	2									b	k	s		B	K	S	2	
0011	3									c	l	t		C	L	T	3	
0100	4									d	m	u		D	M	U	4	
0101	5									e	n	v		E	N	V	5	
0110	6									f	o	w		F	O	W	6	
0111	7									g	p	x		G	P	X	7	
1000	8									h	q	y		H	Q	Y	8	
1001	9									i	r	z		I	R	Z	9	
1010	A					¢	!	6A	:									
1011	B					.	\$	,	#									
1100	C					<	*	%	@									
1101	D					(	)	-	'									
1110	E					+	;	>	=									
1111	F						⌋	?	"									

Legend:






-  Stored as lowercase. Displayed as lowercase on dual-case display station; displayed as uppercase on mono-case display station.
-  Stored as a lowercase symbol. Displayed on mono-case display station. Cannot be entered from the keyboard.
-  Stored as shown. Displayed as shown on mono-case display station. Displayed as lowercase accented character on dual-case display station and as shown in Figure 5-24. May be entered from the keyboard.
-  Displayed on dual-case display station only.
- 6A or AA Cannot be entered from the keyboard or displayed.
-  Invalid I/O code point. Stored and displayed as - (hyphen). Hex 60 returned over I/O.

Figure 6-20. English (US) EBCDIC I/O Interface Code (3274/3277)



Hex 1 Bits 4567		00				01				10				11				Bits 0,1			
		00	01	10	11	00	01	10	11	00	01	10	11	00	01	10	11	Bits 2,3			
		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	Hex 0			
0000	0					SP	&	-										NU 10	NU 11	NU 12	0
0001	1							/		a	j	NU9		A	J						1
0010	2									b	k	s		B	K	S					2
0011	3									c	l	t		C	L	T					3
0100	4									d	m	u		D	M	U					4
0101	5									e	n	v		E	N	V					5
0110	6									f	o	w		F	O	W					6
0111	7									g	p	x		G	P	X					7
1000	8									h	q	y		H	Q	Y					8
1001	9								NU4	i	r	z		I	R	Z					9
1010	A					NU1	NU2	NU3	:												
1011	B					.	NU5	'	NU6												
1100	C					<	*	%	NU7												
1101	D					(	)	-	'												
1110	E					+	;	>	=												
1111	F					NU 13	NU8	?	NU 14												

Notes:

1. National-use differences are shown in Part 2 of this figure.
2. 4F becomes a ! for Austrian/German, Belgian,Brazilian, French, International, Italian, and Portuguese codes.

Figure 6-21. (Part 1 of 2). National Use (NU) Differences I/O Interface Code (3274/3277)

National Use Number I/O Hex Code	1 4A	2 5A	3 6A	4 79	5 5B	6 7B	7 7C	8 5F	9 A1	10 C0	11 D0	12 E0	13 4F	14 7F
Controller Language Device														
U.S. EBCDIC	ç	!	6A	'	\$	#	@	¬	—	(	)	AA		"
Austrian/German	Ä	Ü	ö	'	%	+	?	¬	β	ä	ù	Ö		=
Austrian/German (Alternate)	ö	ü	β		Ü	Ä	Ö	¬						ä
Belgian	ç	!	—	'	\$	#	@	¬	"	AA	6A	ç		"
Brazilian	6A	%	ç	ã	ç	õ	Ã	¬	—	õ	AA			'
Canadian French	ç	—	!	'	\$	#	@		"	AA	6A	\		"
Danish/Norwegian	+	AA	φ	'	Å	Æ	φ	¬	—	æ	å			6A
Danish/Norwegian (Alternate)	φ	å	6A		Å	Æ	φ	¬						æ
Finnish/Swedish	%	+	ö	AA	Å	Ä	Ö	¬	—	ä	å	6A		'
Finnish/Swedish (Alternate)	*ö	å	6A		Å	Ä	Ö	¬						ä
French	6A	?	"	'	\$	#	@	¬	AA	#	!	ç		"
International	[	]	6A	'	\$	#	@	^	—	(	)	\	!	"
Italian	6A	AA	@	"	\$	#	?	¬	#	ç	!	ç		"
Japanese/English	#	!	6A	'	c	#	@	¬	—	(	)	\$		"
Portuguese	(	)	õ	'	6A	Ã	Õ	¬	ç	ã	—	ç		AA
Spanish	ç	!	ñ	'	Pt	Ñ	@	¬	6A	(	)			AA
Spanish (Alternate)	ç	!	6A		Pt	Ñ	@	¬						õ
Spanish-Speaking	ç	!	ñ	'	Pt	Ñ	@	¬	6A	(	)			AA
U.K.	\$	!	6A	'	£	#	@	¬	AA	(	)	\		"

Legend:






-  Stored as lowercase. Displayed as lowercase on dual-case display station; displayed as uppercase on mono-case display station.
-  Stored as a lowercase symbol. Displayed on mono-case display station. Cannot be entered from the keyboard.
-  Stored as shown. Displayed as shown on mono-case display station. Displayed as lowercase accented character to dual-case display station and as shown in Figure 5-24. May be entered from the keyboard.
-  Displayed on dual-case display station only.
- 6A** or **AA** Cannot be entered from the keyboard or displayed.
-  Invalid I/O code point. Stored and displayed as - (hyphen). Hex 60 returned over I/O

Figure 6-21 (Part 2 of 2). National Use (NU) Differences I/O Interface Code (3274/3277)

0000	00000000	0000	0000
0001	00000001	0001	0000
0002	00000002	0002	0000
0003	00000003	0003	0000
0004	00000004	0004	0000
0005	00000005	0005	0000
0006	00000006	0006	0000
0007	00000007	0007	0000
0008	00000008	0008	0000
0009	00000009	0009	0000
000A	0000000A	000A	0000
000B	0000000B	000B	0000
000C	0000000C	000C	0000
000D	0000000D	000D	0000
000E	0000000E	000E	0000
000F	0000000F	000F	0000

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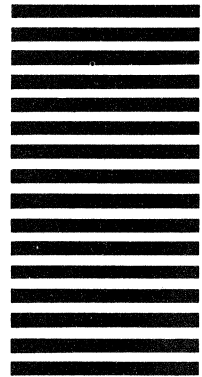
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