

Systems

**IBM 3767 Models 1 and 2
Communication Terminal
Component Description**

IBM

Preface

This manual describes the IBM 3767 Communication Terminal, a multipurpose terminal that communicates with an IBM System/370. The information it contains is directed to customer executives, systems analysts, and systems engineers already aware of the operating procedures for the applications in which they plan to use the terminal.

The first chapter gives an overview of the 3767. It describes the applications and features of the 3767 and the communication facilities required.

The chapter on operating controls follows the chapters on operating characteristics and special features so that the reader can better appreciate the functions of these controls.

Information on installation and physical planning is given in *IBM Remote Multiplexers and Communications Terminals Installation Manual -- Physical Planning, GA27-3006*.

First Edition (June 1974)

Changes are periodically made to the information herein; before using this publication in connection with the operation of IBM systems or equipment, refer to the latest *IBM System/360 and System/370 Bibliography, GA22-6822*, and associated Technical Newsletters for the editions that are applicable and current.

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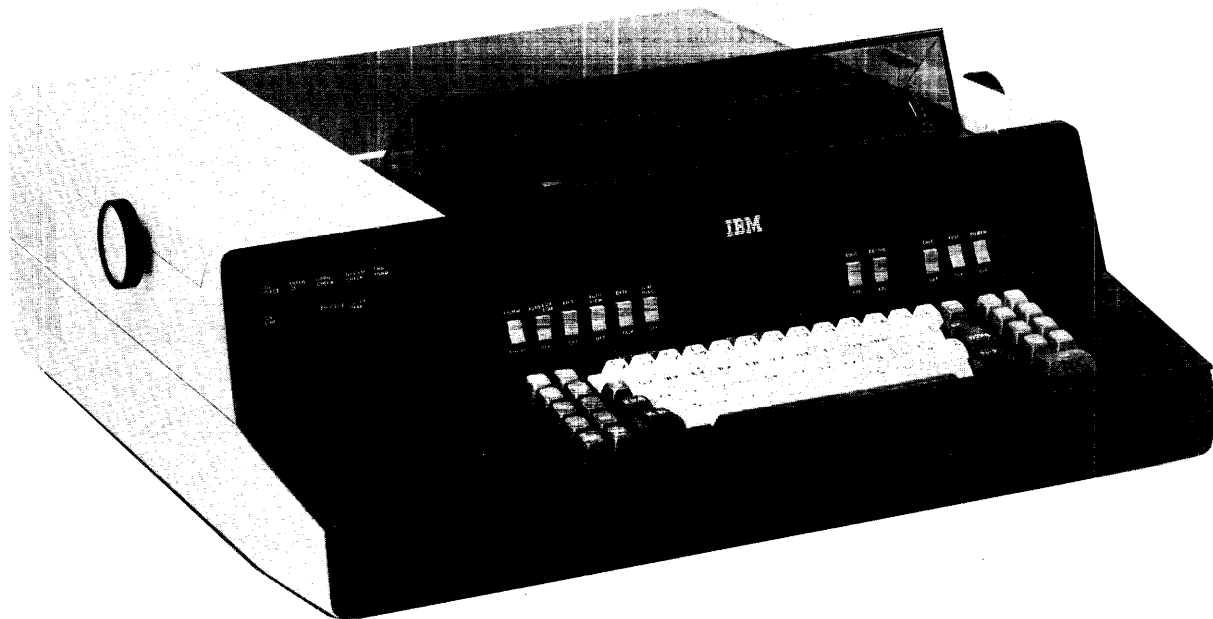
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IBM 3767 Communication Terminal

Chapter 1. Introduction

Description

The IBM 3767 Communication Terminal (Frontispiece) is a compact, movable, desk-top terminal that is available in two models. The 3767-1 prints at an average rate of 40 characters per second. The 3767-2 prints at a maximum rate of 80 characters per second and has a 512-character buffer. Buffer expansion features are available for both models.

The 3767 provides access to a remote CPU through SDLC (synchronous data link control) line control. SDLC is a new sophisticated communications line control that increases functional capabilities. Examples of such capabilities are:

- Full conversational operation
- Fast select
- Code independence
- Minimized half-duplex turnarounds

In addition, SDLC makes possible the automatic recovery of most transmission errors, without the user's awareness that the error has occurred. It also allows expansion of line control functions, as additional capabilities are required in the future. Refer to the *IBM SDLC General Information Manual*, GA27-3093.

Start-stop line controls for the IBM 2740 and 2741 Communication Terminals are available as special features, for the 3767 terminal, permitting the user to migrate to SDLC line control at his own convenience. Simply setting a switch changes the 3767 from start-stop line control to SDLC. However, consideration must be given to the total system configuration and programming support at the time of the changeover. The 3767 Communication Terminal is program-compatible with 2740 or 2741 terminals.

For the user's convenience, and to simplify attaching the 3767 to a communications line, an integrated modem and an acoustic coupler are available as special features. An EIA/CCITT interface is also available for a stand-alone modem.

Other special features available for the 3767 are:

- Calculate-Scientific -- with this feature, the 3767, in local (offline) mode, can be used as a 16-digit desk calculator.
- Magnetic Stripe Reader- -with this feature the reader may be used to enter data and to transmit a terminal operator's identification.
- Vertical Forms Control--with this feature, the user can vertically format his printed output.
- Variable Width Forms Tractor--with this feature, a wide range of form widths can be used.
- Alternate Character Set--with this feature, the user can change from a primary to secondary character set, by setting a switch.

For a complete list of standard, specificity, and special features, refer to Figures 1-1 and 1-2.

Features	Mod 1	Mod 2
2740-1 Point-to-Point Line Control	Sp	Sp
2740-1 Station Control Line Control	Sp	Sp
2740-2 Line Control (Note 4)	Sp	Sp
2741 Line Control	Sp	Sp
EBCDIC Line Code (Note 1)	S	S
Magnetic Stripe Reader	Sp	Sp
Variable Width Forms Tractor	Sp	Sp
Paper Roll Holder	Sp	Sp
Security Key Lock	Sp	Sp
1200 bps Integrated Modem	Sp	Sp
300, 600 or 1200 bps	S	S
Acoustic Coupler (Note 5) (300 or 600 bps)	Sp	Sp
EIA/CCITT Interface	Sp	Sp
200 (WT only), 300, 600 1200 or 2400 bps	S	S
Data-Talk Switch (WT only)	S	S
Vertical Form Control (Note 2)	Sp	Sp
Buffer (512 Bytes)	Sp	St
(1024 Bytes)	Sp	Sp
Buffer Full Alarm	St	St
Buffer Edit (Note 3)	I	I
Calculate-Scientific	Sp	Sp
SDLC/SS Switch	I	I
Alternate Character Set	Sp	Sp
Dial Disconnect Switch (Germany only)	S	S
Print Inhibit	St	St
End of Line Alarm	St	St
Auto Switch	St	St

- St - Standard (no charge)
Sp - Special Feature (charge)
I - Included in other feature
S - Specify Feature (no charge)

- Notes: 1. An EBCDIC, KATAKANA, or Correspondence keyboard is a prerequisite.
2. Variable Width Pin Feed Tractor is a prerequisite.
3. Included in Buffer 512 and 1024 feature.
4. Buffer 512 or 1024 is a prerequisite on the Model 1.
5. A 1200 bps Integrated Modem is a prerequisite.

Figure 1-1. Features

Features	2740-1 Point-to-Point	2740-1 Station Control	2740-2	2741
PTTC/EBCD Line Code (Note 3)	S	S	S	S
Correspondence Line Code (Note 4)	S	S	-	S
1200 bps Integrated Modem	Sp	Sp	Sp	Sp
300 bps	S	S	-	S
600 bps	-	-	S	-
1200 bps	-	-	S	-
Acoustic Coupler (Note 5)	Sp	-	-	Sp
300 bps	S	-	-	S
600 bps	-	-	-	-
Interrupt (Notes 5 & 6)	-	-	-	S
EIA/CCITT Interface	Sp	Sp	Sp	Sp
200 bps (WT only)	S	S	-	S
300 bps	S	S	-	S
600 bps	-	-	S	-
1200 bps	-	-	S	-
Dial Disconnect Switch (Germany only)	S	-	-	S
Print Inhibit	St	St	St	St
Record Checking	St	St	St	-
End of Line Alarm	St	St	St	St
Auto Switch	St	St	-	-
Buffer Receive	-	-	St	-
Buffer 120 bytes (Note 1)	-	-	S	-
248 bytes (Note 1)	-	-	S	-
440 bytes (Note 1)	-	-	S	-
Buffer Full Alarm (Note 2)	-	-	I	-
Buffer Edit (Note 2)	-	-	I	-
Auto Terminal ID	-	-	-	S

St -- Standard (no charge)
I -- Included in other Feature
S -- Specify Feature (no charge)
Sp -- Special Feature (charge)

- Notes:
1. Buffer 512 or 1024 is a prerequisite.
 2. Included in Buffer 120, 248, and 440 byte feature.
 3. An EBCDIC keyboard is a prerequisite
 4. An EBCDIC, or Correspondence keyboard is a prerequisite.
 5. 1200 bps Integrated modem is a prerequisite.
 6. Required only for 2-wire communications facilities.

Figure 1-2. Start-Stop Features

Applications

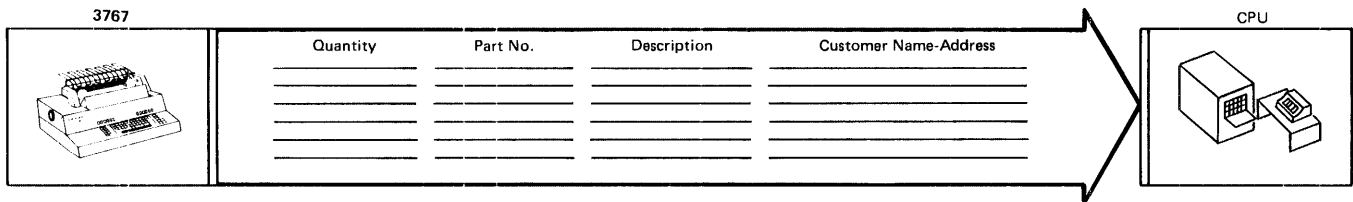
The flexibility and usefulness of the 3767 Communication Terminal is enhanced by its local mode (offline) capabilities, as follows:

- It can be used as a keyboard-printer for normal secretarial typing. Buffer editing, to ensure the correctness of entered data is standard on the 3767-2 and is available as a special feature (the Buffer feature) for the 3767-1.
- Horizontal and vertical (using the Vertical Forms Control special feature) formatting may be done.
- The 3767 can function as a desk calculator, by adding the Scientific Calculation special feature. Simply setting a switch is all that is required to activate the calculation feature. Scientific Calculation offers the following functions:

addition	subtraction	multiplication
division	inversion	square root
mean/standard deviation		storing of constants
Log X	In X	Sin X
Cos X	Tan X	$\text{Sin}^{-1} X$
$\text{Cos}^{-1} X$	$\text{Tan}^{-1} X$	X^Y
e^x		

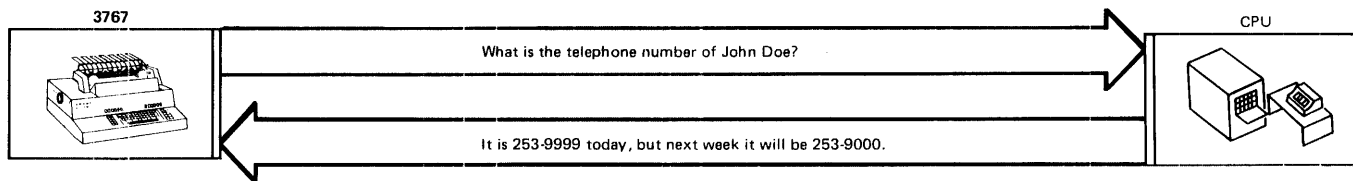
The following illustrations show some of the many applications in which the IBM 3767 was designed to operate, in communicate (online) mode.

DATA ENTRY



In this application, the 3767 is used primarily for entering data. Entering an order is a typical example of this type of application.

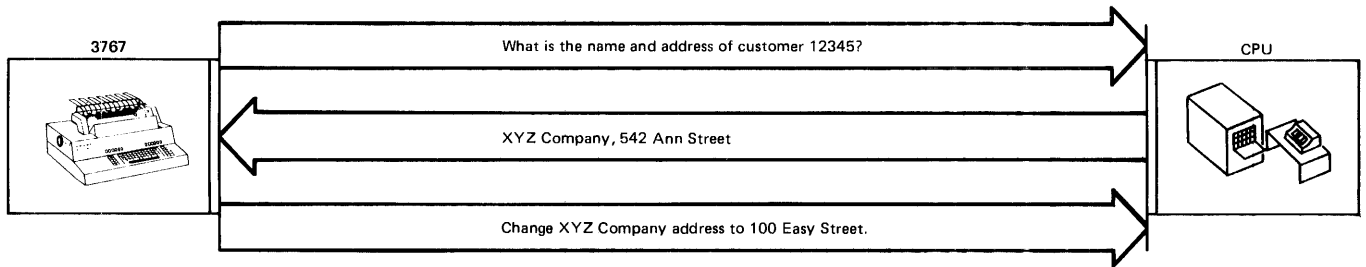
SIMPLE INQUIRY



The user interrogates a data base by presenting a predefined inquiry. This type of inquiry has the following characteristics:

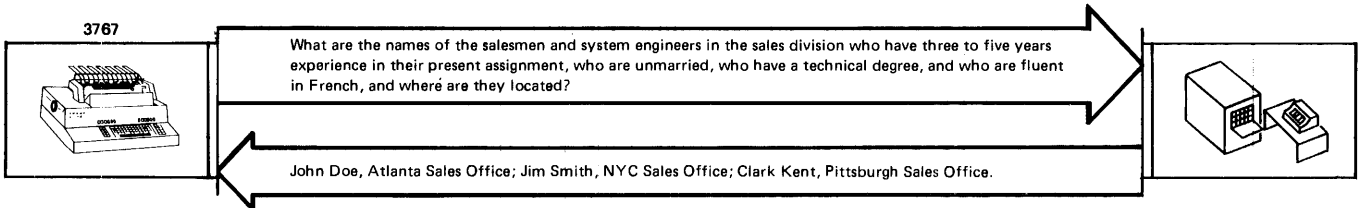
- One logical file per inquiry is searched.
- Operator has limited or no update capability.
- Output is alphameric.

INQUIRY AND UPDATE



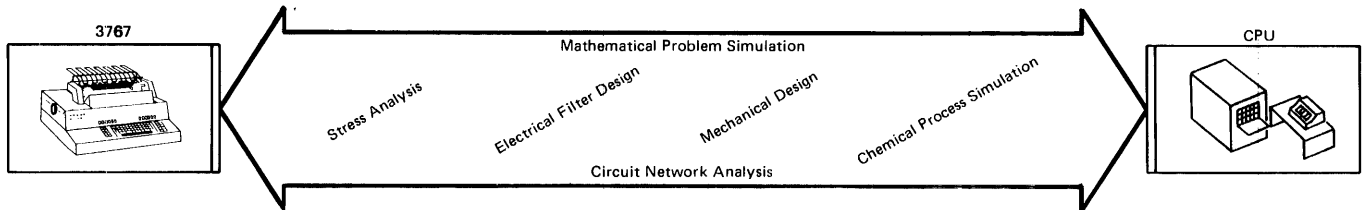
The user interrogates a data base by presenting a predefined inquiry. He then evaluates the response and, if necessary, updates the data base.

COMPLEX INQUIRY



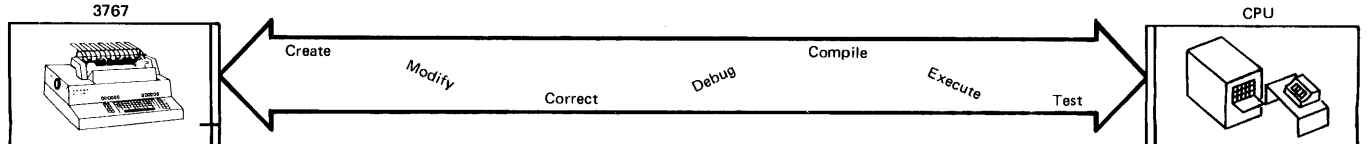
The user may interrogate a data base by presenting several unstructured, complex inquiries. More complex inquiries might involve requests for summaries, trends, and correlations among multiple files.

PROBLEM SOLVING



This application permits the user, through time-sharing, to solve problems using high-level languages such as BASIC and FORTRAN.

PROGRAMMING



This application permits implementing all aspects of programming.

Printer

A fast, versatile, bidirectional matrix printer is incorporated in the 3767 terminal. Printing characteristics of the two models of the 3767 are as follows:

	Model 1	Model 2
Printing Speed (characters per second)	40 (Avg.)	80 (Max.)
Print Positions	132	132
Character Set	96/128*	96/128*

*A 128-character KATAKANA set is available for Japan only.

The 3767 printer prints while it is moving in either direction. The 3767 decides automatically whether to print in the reverse or forward direction, to obtain faster output (printing speed depends upon line speed when the 3767 is operating with 2740-1 or 2741 start-stop line control).

Forms

The terminal accepts up to six-part forms (with a total thickness of 0.018 inches). Five- and six-part forms should be tried for satisfactory feeding and printing registration. Refer to *Form Design Reference Guide for Printers*, GA24-3488. Forms, whether cut or continuous, must not contain metallic staples, and multipart cut forms must be glued together at the top edge. A variable width forms tractor is available as an option.

Keyboard Character Sets and Transmission Codes

The user may select one of three available keyboard character sets, as follows:

Character Set	No. of Chars.	Data Keys
EBCDIC	88/96*	44/48*
Correspondence (US only)	88	44
KATAKANA (Japan only)	128	48

* World Trade country keyboards have 47 data keys (UK has 48). 88 and 44 apply to US keyboards; 96 and 48 apply to World Trade keyboards.

See Appendix A for illustrations of keyboard variations.

An alternate keyboard character set may be specified. For example, the user whose main application is EBCDIC can also use APL. To do this, he can order a card that illustrates the desired key codes, with decals. These decals may be removed from the card and attached to the front of the appropriate keys, or the card may be carried by the operator for easy reference. To change character sets, the operator needs only to set a switch.

One of the following transmission codes may be selected:

SDLC

EBCDIC

Start-Stop { PTTC/EBCD code
Correspondence (standard Selectric[®] typewriter print
element code)

For start-stop line control, the customer may use either the PTTC/EBCD or Correspondence transmission code.

Local Mode Operations (Offline)

The following operations can be performed when the terminal is in local mode:

Keyboard-to-printer	(standard feature)
Keyboard-to-printer with editing	(included in Buffer feature)
Tab setting*	(standard feature)
VFC setting*	(special feature)
Offline calculation	(special feature)
Test*	(standard feature)

*This status can be entered when the terminal is in either local or communicate code.

When the terminal is in local mode, with all feature switches off, it may be used for normal secretarial typing. To perform other local mode operations, the user needs only to set the Test or the Calculate switch or to press a function key.

Communications Facilities

The customer may choose from a wide variety of communications facilities, as described in the following text (refer to Figures 1-3 and 1-4).

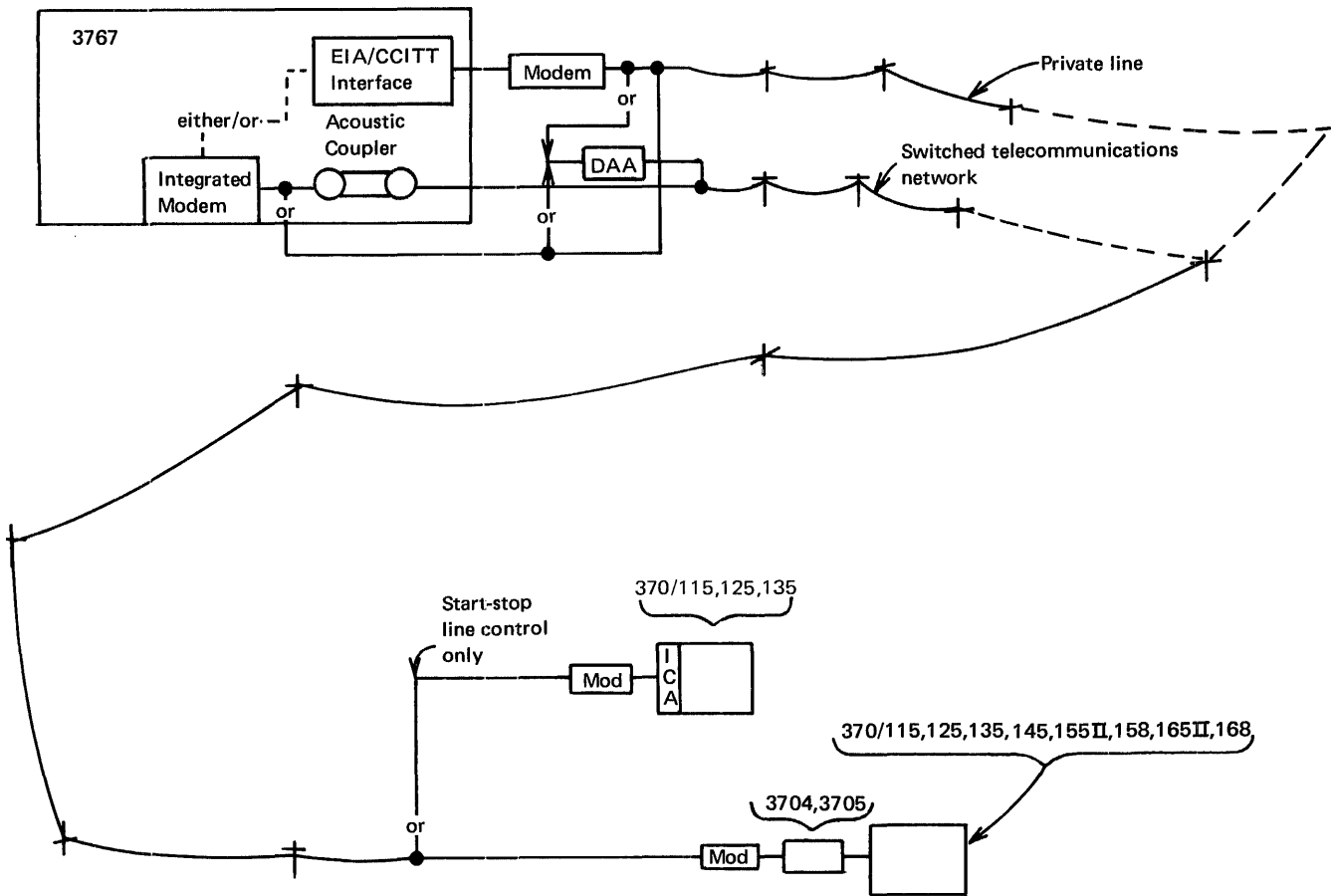


Figure 1-3. Communications Facilities

Line Attachment \ Line Control	SDLC	2740-1/ 2741	2740-2
	1200 bps Integrated Modem	600/1200 bps	300 bps	600/1200 bps
1200 bps Integrated Modem plus Acoustic Coupler	600 bps	300 bps	—
EIA/CCITT Interface	600/1200/ 2400 bps	200*/300 bps	600/1200 bps

*World Trade only.

Figure 1-4. Line Speeds

SDLC (Basic or Buffered) or Start-Stop, Point-to-Point

In this configuration the 3767 operates in half-duplex mode, over the following facilities:

1. Common-carrier leased private-line service, non-switched, (or the equivalent privately owned service) using an integrated modem or an EIA/CCITT interface with an IBM stand-alone modem, (or an equivalent stand-alone modem of another manufacturer)
2. Common-carrier switched telecommunications network, using an integrated modem and a DAA, an integrated modem with an acoustic coupler, or an EIA/CCITT interface with an IBM stand-alone modem and a DAA (or an equivalent stand-alone modem of another manufacturer).

SDLC (Basic or Buffered) or Start-Stop Multipoint

In this configuration, the 3767 operates in half-duplex mode, over the following facilities:

Common-carrier leased private-line service, non-switched, (or the equivalent privately owned service), using an integrated modem or an EIA/CCITT interface with an IBM stand-alone modem (or an equivalent stand-alone modem of another manufacturer).

Modems

The customer may consider the following modem configurations for his installation:

- Switched Network--Integrated modem with DAA or acoustic coupler, or an EIA/CCITT interface for stand-alone modems
- Leased Line--Integrated modem or EIA/CCITT interface for stand alone modems

Refer to "Chapter 3. Special Features" for more information.

Maintenance Aids

The 3767 is designed to allow fast analysis and repair of malfunctions by service personnel. It is packaged so that failing units can be readily adjusted or replaced. Indicators, printouts, automatic test procedures, online tests, and maintenance analysis procedures are provided, to facilitate isolation of the problem or failing unit.

Operator Test (Test Switch)

The operator can, by momentarily setting the Test switch, run the automatic test procedure. This procedure tests the hardware of the terminal. It informs the operator, by means of indicators, alarms, and printouts, of the current status of the terminal.

Chapter 2. Operating Characteristics

Modes of Operation

The 3767 has two primary modes of operation:

Communicate (online)

Local (offline)

In communicate mode, the 3767 communicates with a multiplexer or the ICA (start-stop line control only) of certain host systems, using one of the following line control methods:

Standard	{ Basic SDLC (3767-1) Buffered SDLC (3767-2)
Optional	{ Buffered SDLC (3767-1 with Buffer Expansion feature) 2741 start-stop 2740-1 point-to-point, start-stop 2740-1 station control, start-stop 2740-2 start-stop

See "Chapter 3. Special Features," for start-stop information.

Communicate Mode

The states of the 3767, while it is in communicate mode, are described in the following paragraphs.

Standby

The 3767 enters this state from a power-on reset, if the COMM/LCL switch is in the COMM position, or when the 3767 is changed from local to communicate mode by having the COMM/LOCAL switch set to the COMM position. The 3767 has the following characteristics when it is in the standby state:

- The keyboard is normally unlocked, and the Proceed light is on.
- The 3767 will accept data entered from the keyboard or the communication line, whichever occurs first.
- The Cancel key is not active.
- The Attention key is active.

Transmit

The 3767 enters this state, from the standby state, when the operator enters the first data byte into the buffer. The 3767 has the following characteristics when it is in the transmit state:

- The keyboard is normally unlocked and the Proceed light is on. The keyboard locks if all buffer segments contain data that is ready to be transmitted or data that is in the process of being transmitted. The keyboard also locks if the 3767 is waiting for a positive acknowledgment from the CPU.
- The Cancel and Attention keys are active.

Receive

The 3767 enters this state, from the standby state, when the first data byte of a message is received from the CPU. The 3767 enters this state from transmit state when the last (or only) message segment has been transmitted and the 3767 requests a change in data flow direction from the CPU.

The 3767 has the following characteristics when it is in the receive state:

- The keyboard is locked, except for the Attention and Cancel keys.
- The Proceed light is off.

Transmit Interrupt

While the terminal is in transmit status, the CPU can interrupt the transmission and send a message to the 3767. When this occurs, the entered data is automatically purged, the Proceed light goes off, and the terminal reverts to receive status.

The CPU can also signal the terminal operator by transmitting a bid request. This turns on the CPU Select light. The operator then has two choices, as follows:

1. He can continue entering the message, then press the EOM key to transmit the rest of the message, or
2. He can press the Cancel key, which clears the buffer and causes any part of the message that may have been transmitted previously, to be discarded by the CPU.

Receive Interrupt

If the terminal operator wishes to transmit a message and the terminal is in receive status, he presses the Cancel key. This interrupts the CPU. The 3767 ignores the rest of the message segment being transmitted by the CPU.

Basic SDLC Transmit

The operator may enter up to 256 bytes before he starts transmission. Data can also be entered while transmission is in progress, however, if the operator presses the EOB or EOM (if specified by the CPU) key after he has entered 128 or fewer data bytes.

If the Auto switch is on, pressing the Return key or the Form Feed key also starts the transmission. While one buffer segment is transmitting, the other may be used for data entry if the message being transmitted has 128 or fewer data bytes.

If the operator fills the second segment before the first segment's data has been transmitted, the Proceed light goes off (and the keyboard locks) until all of the data in the first segment has been transmitted error-free. If the data entered occupies more than one segment, it is transmitted as one message segment, and no overlapped transmission and keyboard entry is possible.

A buffer overflow condition occurs if the operator tries to enter more than 256 bytes before starting transmission. The Proceed light goes off, and a long audible tone sounds. This condition is reset by pressing the Reset, Buffer Return, Buffer Backspace, EOB, or EOM key. A short (250 ms) audible tone sounds when the print position is 10 positions from the right margin and when the buffer is equal to, or less than, 10 bytes from being full.

Buffered SDLC Transmit

The 512-byte buffer in the 3767-2 (or the 3767-1 with the 512-byte Buffer Expansion feature) is divided into two 256-byte segments. The 1024-byte buffer (Buffer Expansion feature) is divided into four 256-byte segments. The operator may enter up to 512 or 1024 bytes before he starts transmission, if the Edit switch is on. Data can be entered while transmission is in progress, if one of the other buffer segments is empty when the EOB or EOM key is pressed (or the Return key, if the Auto switch is on). If the Edit switch is off, the entered data is automatically transmitted when a buffer segment is filled.

If all of the buffer segments contain data, the Proceed light goes off (and the keyboard locks) until the data from at least one of the segments has been transmitted. A buffer overflow condition occurs if the operator tries to enter more than 512 or 1024 data bytes before starting transmission. This condition must be reset, as has just been described under "Basic SDLC Transmit"; the Buffer Line Return key also performs this reset with buffered SDLC.

Basic or Buffered SDLC Receive

The 3767 can receive a message containing up to 256 data bytes per transmission. The received data is stored, starting at byte 1 of segment 1.

Message printing starts after a message segment has been received without an error. A response is transmitted immediately (with buffered SDLC) if at least one buffer segment is free or when the entire buffer is free (with basic SDLC).

A buffer segment is considered to be free if it is empty or if it has transferred its information to the printer.

Buffer Edit

Total text (buffer) edit, with the 3767 in communicate or local (with the Edit switch on) mode, is standard on the 3767-2 and is included in the Buffer Expansion special feature available for the 3767-1. Single line editing, with the 3767 in communicate mode and the Auto switch on, is standard on both models. Data that the operator wishes to edit before transmission must be edited while the 3767 is in communicate mode.

Current and Edit Pointers

These pointers are introduced here to explain the buffer editing operation. The current pointer points to the next available buffer position. The edit pointer keeps in step with the current pointer during data entry. However, the edit pointer may be decremented by the Buffer Return, the Buffer Line Return, or the Buffer Backspace key. It may then be incremented by data keys or by the Print Buffer, the Print Line, or the Print Character key until it reaches the current pointer. The data that is transmitted lies between the beginning of the buffer and the edit pointer.

The Buffer Return and Buffer Backspace keys are operative during single-line editing. All of the buffer edit keys are operative during total text edit.

Local Mode

The 3767 can, with the Communicate/Local switch set to the LOCAL position, be used as a keyboard-printer for secretarial typing. In addition, the following operations are possible:

- Total text edit--This feature is standard on the 3767-2 and is included in the Buffer Expansion special feature for the 3767-1. It is operative when the 3767 is in local mode, with the Edit switch on, and allows an operator to verify, cancel, and reenter data before it is printed. A total text edit may also be made when the 3767 is in communicate mode.
- Vertical format setting--Refer to "Vertical Form Control" in "Chapter 3. Special Features".
- Offline Calculation--Refer to "Offline Calculation" in "Chapter 3. Special Features".

Horizontal Formatting

Tabbing is the movement of the carrier to the right, when the Tab key is pressed or when the appropriate control characters are received from the CPU. The tab and left or right margin stops may be set at any point between print position 1 and 132.

The Tab key is operative when the terminal is in either communicate or local mode. The terminal must be in communicate mode for a tab operation to take place under CPU control.

When a tab operation is initiated, the carrier moves to the right until it encounters a tab stop. The tab and left or right margin stops may be set by the operator when the terminal is in local or communicate mode, or by the CPU when the terminal is in communicate mode under SDLC line control.

To set a tab or a left or right margin stop at a particular print position, simultaneously press the Code and either the Tab Set, the Left Margin Set, or the Right Margin Set key when the desired position is displayed in the column indicator.

To clear a tab stop, simultaneously press the Code and Tab Clear keys when the desired position is displayed in the column indicator. When a new left or right margin is set, the old margin is automatically cleared. The carrier spaces if the Tab Key is pressed when no tab stop is set. If the Tab key is pressed when the carrier is to the right of the last tab stop, the Operation Check light comes on, and a long audible tone sounds. Press the Reset Key to reset this condition. Margins and tab stops may be set or cleared when the 3767 is in either local or communicate mode. All tab positions are cleared by a power-on reset.

Chapter 3. Special Features

2740-1 Point-To-Point Line Control

This feature enables the user to communicate with the CPU by the 2740-1 point-to-point, start-stop line control. (See *IBM 2740 Communication Terminal Models 1 and 2 Component Description*, GA24-3403, for detailed 2740 line control information.)

The functions of the 3767, when it is communicating in 2740-1 point-to-point line control mode, are the same as those of the 2740-1. The Transmit Control special feature is not available on the 3767.

2740-1 Station Control Line Control

This feature enables the user to communicate with the CPU by 2740-1 station control start-stop line control. (See *IBM 2740 Communication Terminal Models 1 and 2 Component Description*, GA24-3403, for detailed 2740 line control information.)

The functions of the 3767, when it is communicating in 2740-1 station control line control mode, are the same as those of the 2740-1.

2740-2 Line Control

This feature enables the user to communicate with the CPU, under 2740-2 start-stop line control. See *IBM 2740 Communication Terminal Models 1 and 2 Component Description*, GA24-3403, for detailed 2740 line control information.

The following 2740-2 functions are supported by the 3767 having this feature:

- 2740-2 line control with Record Checking and Buffer Receive
- Buffer edit

The Header Control special feature is not available on the 3767. The functions of the 3767, when it is communicating in 2740-2 line control mode, are the same as that of the 2740-2.

2741 Line Control

This feature enables the user to communicate with the CPU by 2741 start-stop line control. The 3767 operation is virtually identical to that of the 2741, when it operates under 2741 start-stop line control. (See *IBM 2741 Communication Terminal Component Description*, GA24-3415, for detailed 2741 line control information.)

The following 2741 line control features are standard on the 3767:

Receive Interrupt
Transmit Interrupt
Print Inhibit

After the connection to a switched network has been made, 3767 and 2741 operations are the same, except that VRC checking is included in the 3767.

1200 bps Integrated Modem

This IBM integrated modem enables a terminal to be attached to a public switched telecommunication network, by a DAA or acoustic coupler, or to a private line.

The integrated modem permits half-duplex operation at line speeds of up to 1200 bps.

Modem Interfaces

The following text briefly describes the modem interfaces available for the 3767.

Data Access Arrangement (DAA):

This interface provides the connection between the integrated modem and a switched telephone network. A common-carrier-type, CDT, manual DAA (or equivalent) is used.

A data call using the CDT DAA is placed in the same way as placing a call with a telephone. Calls are made from the 3767 with the manual CDT DAA to a CPU having either a manual CDT DAA or an auto answer feature and a CBS-type coupler.

Acoustic Coupler:

This interface connects the 3767 to a switched telephone network, using an ordinary telephone, and is useful in applications requiring relocation of the terminal. The integrated modem must be used with the acoustic coupler.

The handsets of the following telephones, or equivalent, can be used with the acoustic coupler (novelty handsets are excluded):

Automatic Electric
Type 811 handset, used with the type 800 telephone set

Kellog-ITT, Stromberg Carlson, Western Electric
Type G handset, normally supplied with the type 500 telephone set

EIA/CCITT Interface:

This interface provides the signals and signal conversions required for use with an EIA-type stand-alone modem. Some of the IBM stand-alone modems available for use with the 3767 are:

IBM 3976 Model 1	}	World Trade only
IBM 3976 Model 2		
IBM 3976 Model 3		
IBM 3872 (2400 bps, using SDLC)		

Vertical Form Control (VFC)

This feature operates with SDLC line control only and enables the operator (in local or communicate mode) or the CPU (in communicate mode) to arrange the printed output in a desired vertical format. The operator must be aware of the following requirements before he starts the formatting procedure:

- The page size must be specified; one page can contain up to 102 lines of print.
- Each vertical tab position, if any, must be specified; up to 102 vertical tab positions per page are possible. They must fall between line 1 and the bottom margin.
- The bottom margin must be specified; it must not be larger than the page size.
- The VFC home position (first print line) must be set by using the platen knob to align the paper.

The CPU performs vertical tab and form feed functions by using standard function characters.

By pressing the Vert Tab Key, the operator can manually skip to the next vertical tab position. If there are no intervening vertical tab positions, a line feed operation is performed.

Paper Advance

Pressing the Form Feed key when the terminal is in either communicate or local mode causes the form to advance to the home (first print line) position and column 1 or the left margin of the next page.

Setting Procedures (VFC)

The procedure for setting the vertical format of a page is:

1. Press the Code Key and the Vert Form Set Key simultaneously. This places the terminal in VFC set status, initiates a carrier return and line feed, and resets the previous VFC page image.
2. Enter X, B, Y, Y, Y, --- Y. X, B and Y are defined as follows:

X defines the page size (the total number of print lines on the page); it must be a three-digit number equal to $001 \leq X \leq 102$, and it must be followed by a comma.

B defines the bottom margin; it must be a three-digit number equal to $001 \leq B \leq X$, and it must be followed by a comma.

Y defines a vertical tab position; it must be a three-digit number equal to $001 \leq Y \leq B$, and it must be followed by a comma, if other Y values are to be entered.
3. Press the Return key.
4. Set the first print line (home position) of the page, by using the platen knob.

The terminal is then ready to accept tab and form feed signals from the CPU.

The Operation check light comes on if:

- A parameter larger than 102 is entered
- A non-numeric character is entered
- Fewer than three digits per parameter are entered
- The value entered for the bottom margin is greater than the value entered for the paper size
- The value entered for any vertical tab position is greater than the value entered for the bottom margin.

The Reset key must be pressed to turn off the Operation Check light, before the error can be corrected and the setting procedure can be continued. An error graphic is printed to identify the erroneous entry.

Realigning the Page

If it is necessary to realign the paper--for example, when new forms are inserted--the operator should press the Form Feed key, wait until the indexing stops, and then align the paper to the home position by using the platen knob.

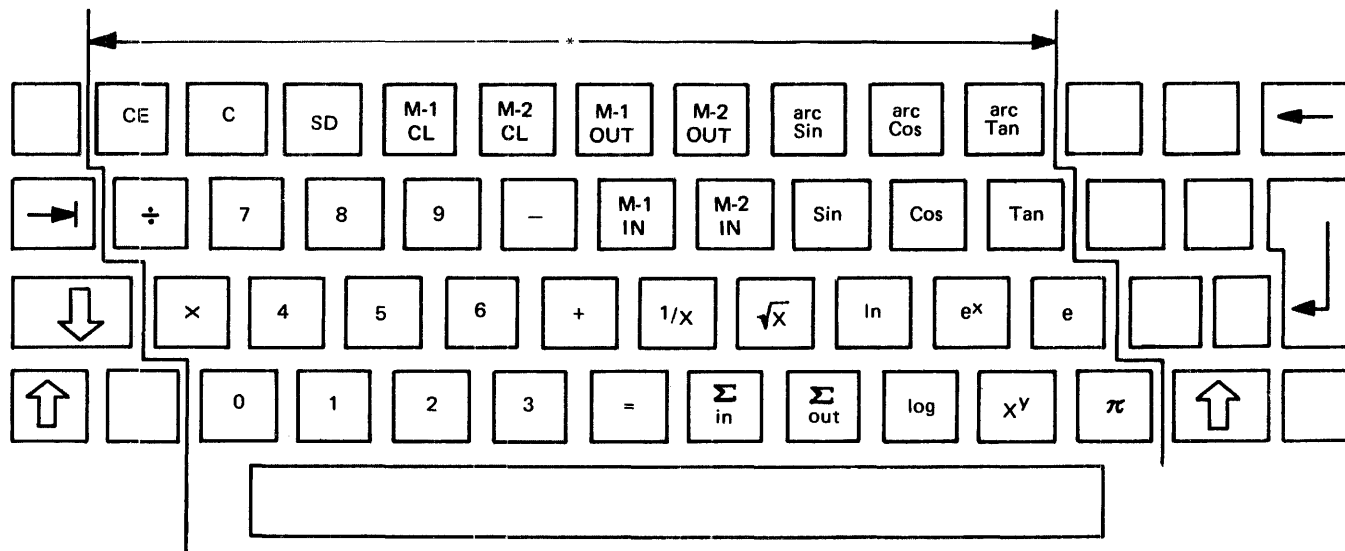
Clearing VFC Positions

Clear VFC positions as follows:

1. Press the Code and Vert Form Set Keys simultaneously.
2. Press the Reset key.

Calculate-Scientific

With this feature installed, the terminal can be used as a desk calculator, when the CALC switch is on, in local mode. Certain keyboard keys change their function when the terminal is in offline calculate status (see Figure 3-1). Nomenclature is provided by decals.



* Keys for Offline Calculation
Nomenclature is provided by decals.

Figure 3-1. Key Arrangement for Offline Calculation Feature

Since the terminal is in local mode when it is being used as a desk calculator, calculation results cannot be automatically transmitted, nor can received data be automatically used as input for calculation.

Calculate Functions

The Calculate-Scientific special feature provides the following functions, with 16-digit precision:

addition	Log X	In X	Sin X
subtraction	Cos X	Tan X	Sin ⁻¹ X
multiplication	Cos ⁻¹ X	Tan ⁻¹ X	x ^y
division	e ^x		
inversion			
square root			
mean/standard deviation			

Entering Calculate Status

The terminal must be in local mode for the Calculate switch to be effective. Place the terminal in local mode by setting the Local/Communicate switch to the LOCAL position. Then set the Calculate switch to the CALC position. See the *IBM 3767 Communication Terminal Operator's Guide* for problem-solving procedures.

Offline Calculation Characteristics

The following text describes characteristics of the terminal when it is used as a calculator.

Maximum and Minimum Values

The maximum absolute value the terminal can handle is a 16-digit number made up of all-9s:

9999999999999999.

The minimum absolute value is this 16-digit fraction:

.0000000000000001

Decimal Point Position

The user can set the decimal point at any of the 17 possible positions. Once set, this position should not be changed during the course of a particular problem.

If the user does not set the decimal point position at the start of offline calculations, the terminal assumes a "default" position for the decimal point. This "default" position provides for a 12-digit integer and a 4-digit fraction.

Sign

Both positive and negative numbers can be used in calculation. The range and precision of entries and answers are independent of the sign.

Error Conditions

If the operator makes an erroneous entry, the following error conditions can occur:

Multiple Pressing of the Decimal Key: When the user enters a number, the first decimal point entry determines the separation of integers and fractions. Any other decimal point entries for the same number are ignored.

Overflow: If a number is entered that has more positions in its integer portion than are allowed by the current decimal point position, the operation is stopped, the overflow is printed, and all registers except memory are cleared.

The operator must then press the Accumulator Clear key to resume calculations.

Underflow: If a number is entered that has more positions in its fraction part than are allowed by the current decimal point position, the excess digits are ignored. The operation may be completed, however, using the truncated fraction.

Magnetic Stripe Reader

This magnetic stripe reader (Figure 3-2) reads information magnetically encoded on a stripe along the edge of a badge or card, such as a credit card. It operates with SDLC line control only.

The following applications are representative of those that a customer may wish to implement:

- Operator identification
- Client account or transaction code
- Parameter information
- Reader information
- Master record

The reader is connected to the 3767 by an 8-foot cable. The reading mechanism and control logic receive their power from the 3767. Power is on in the reader whenever 3767 power is on and the cable is connected.

Magnetic Stripe Card Specifications

The document may be made of card stock or plastic, with a thickness range of from 0.007 to 0.045 inches. This range permits the use of documents such as tab cards, credit cards, and laminated identification badges.

The laminated stripe may be of any practical length, but the magnetic track dimensions and the distance from the bottom edge of the document must be as follows (see Figure 3-3):

- Stripe width 0.240" minimum
- Outside stripe edge to document edge 0.223" maximum
- Inside stripe edge to document edge 0.463" minimum

Magnetic Code

Data must be recorded, using the ABA 5-bit code, which is the 4-bit BCD subset with odd parity. The bit density for an ABA track is 75 bits per inch, and data must be recorded, using two-frequency coherent phase recording (F2F).

For details of coding techniques and guidelines, the user should refer to ABA magnetic stripe credit card specifications.

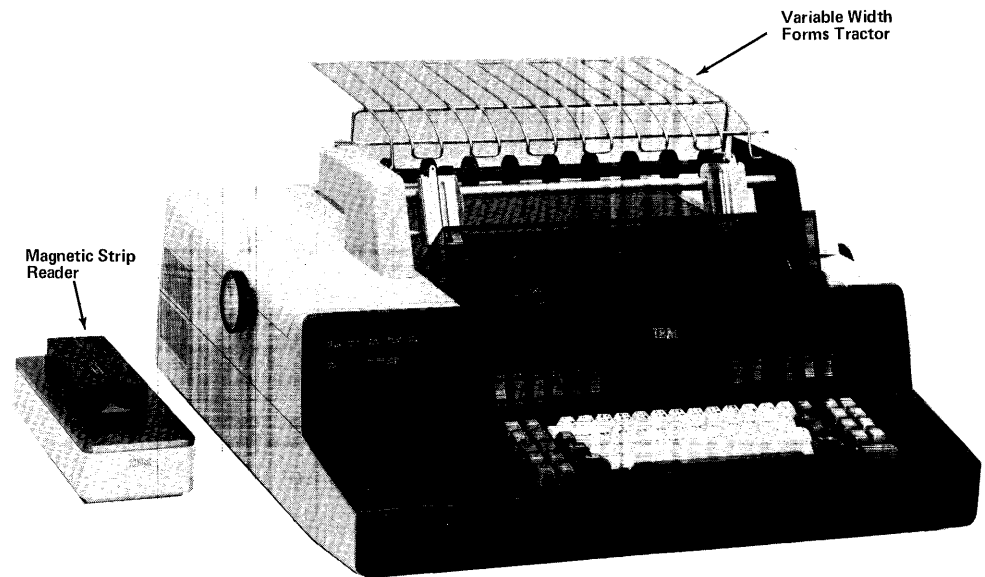


Figure 3-2. Magnetic Stripe Reader

Using the Magnetic Stripe Reader

The reader is ready to read a magnetically encoded badge or card when the 3767 Proceed light is on. For an operator identification transmission, the CPU may request the terminal operator's identification by sending a Print Inhibit code that inhibits the 3767 from printing the operator's ID. It also turns on the Enter ID light. The operator's ID may be entered via the reader or the keyboard. Print inhibit status is reset when the 3767 receives the Enable Print code from the CPU.

Transmission Characteristics

The information read from the magnetic stripe document is tested for correct parity, LRC, Start of Message character, document insertion, and reading speed. If the check indicates an error (if the 3767 OPRN CHECK light comes on) the operator must press the Reset Key and reread the document.

If an operator identification read operation is in progress and the OPRN CHECK light comes on, the terminal remains in print inhibit status, thus enabling the operator to reenter the identification document or reenter the ID via the Keyboard.

Buffer Expansion (512 bytes)

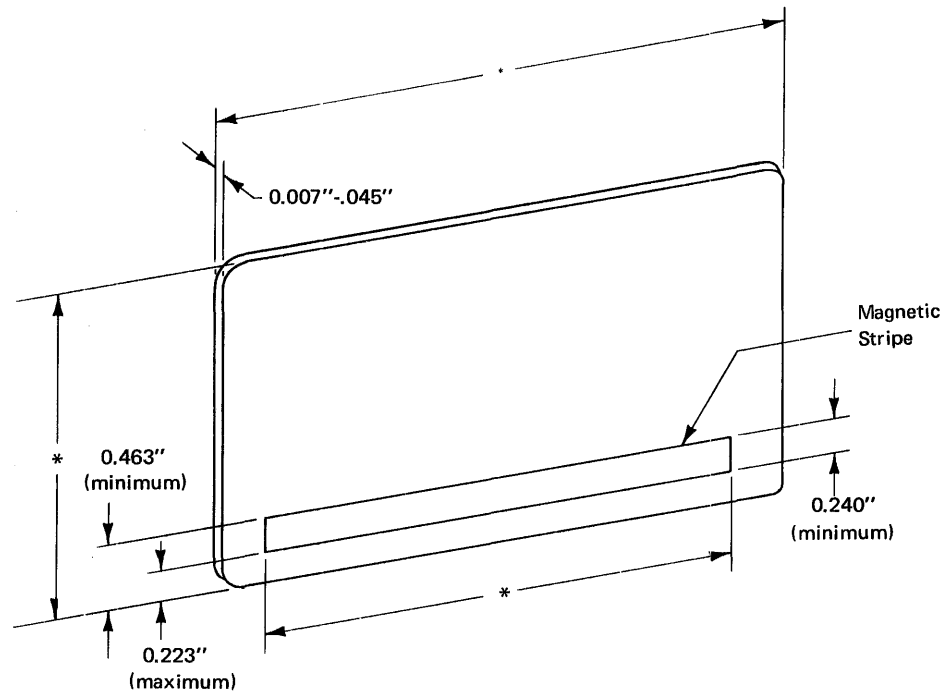
This feature, standard on the 3767-2, is a prerequisite to the 2740-2 Start-Stop Line Control feature for the 3767-1. It provides the 3767-1 with buffered SDLC capability. It also includes buffer editing, which allows the correcting and manipulating of buffer data.

Buffer Expansion (1024 bytes)

This feature, available as a special feature for the 3767-1 and -2, expands, to 1024 bytes, the buffer available for buffered SDLC operation.

Security Keylock

This feature enables the user to prevent unauthorized use of the terminal. Each terminal has a unique key.



*May be any reasonable dimension.

Figure 3-3. Magnetic Stripe Reader Document Specifications

Auto Terminal ID

This feature is available for a 3767 with the 2741 Start-Stop Line Control feature. It provides a four-digit address that is assigned by IBM when the terminal is installed and a unique identification for the terminal within the system. This feature is standard when SDLC line control is used.

Variable Width Forms Tractor

With this feature installed, the customer can use pinfeed paper with hole-to-hole dimensions of from 3 to 14 1/2 inches (15" overall). This feature must be installed with the VFC feature, to ensure continuous-form registration.

Paper Roll Holder

This feature gives the customer a paper roll holder to facilitate the movement of paper away from the terminal. The holder allows the use of rolls of up to 5.5 inches in diameter. Friction-fed roll paper must be single-ply.

Station Control

This feature is available for the 3767-1 and -2, and it functions with 2740-1 start-stop line control. It enables the terminal to be polled or addressed from the multiplexer.

Integrated Modem Interrupt

This feature is available for the 3767-1 and -2. It is required only with 2741 start-stop line control and the 1200 bps Integrated Modem, when it is used on a two-wire facility. It enables the user to interrupt incoming data by pressing the Attention key. It also enables the CPU to interrupt data being received from the 3767.

Pressing the Attention key during a receive operation may cause some incoming data to be lost or may cause transmission errors.

Alternate Character Set

This feature gives the customer a second character set. For example, the user whose main application is EBCDIC can also use APL. The selection is made by simply setting a switch to the desired character set. A card may be ordered which illustrates the alternate character set with decals. These decals may be removed from the card and attached to the front of the appropriate keys, or the operator may carry the card for easy reference. Refer to Figure 3-4 for available primary and alternate character sets. Only one alternate character set per terminal may be specified.

		SDLC				Start-Stop					
		Graphics			Line Code	Graphics				Line Code	
		C o r r e s p o n d e n c e	E B C D I C	M O N O	E B C D I C	C o r r e s p o n d e n c e	E B C D (note 1)	A P L	M O N O (note 1)	C o r r e s p o n d e n c e	P T T C / E B C D
Primary Char. Set (Keyboard)	Alternate Char. Set										
Correspondence	EBCDIC APL	X	X		X X	X	X	X		X X	X
EBCDIC	Correspondence APL MONO (note 2)	X	X		X X	X	X	X	X	X X X	X X X

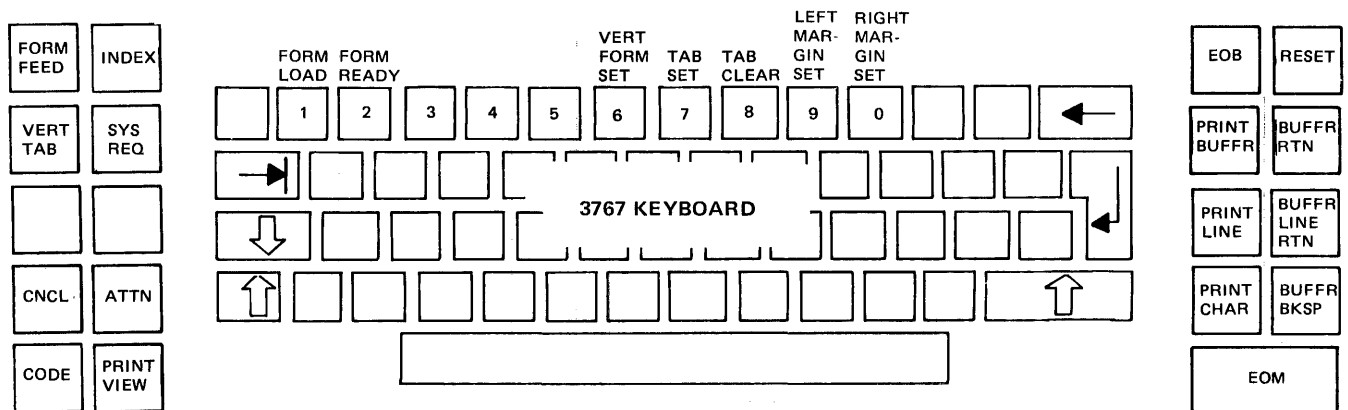
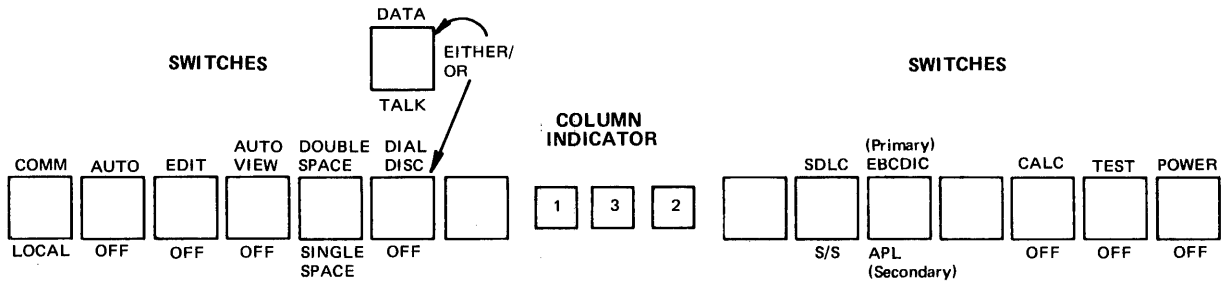
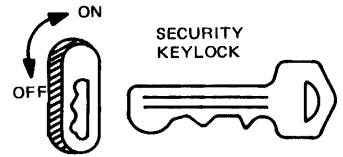
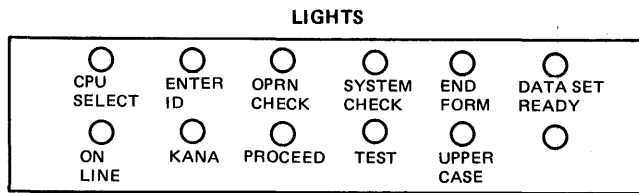
Notes:

1. Subset of EBCDIC
2. Uppercase alphabetic characters are printed from the Keyboard; upper or lowercase characters may be printed from the communications line.

Figure 3-4. Primary and Alternate Character Sets

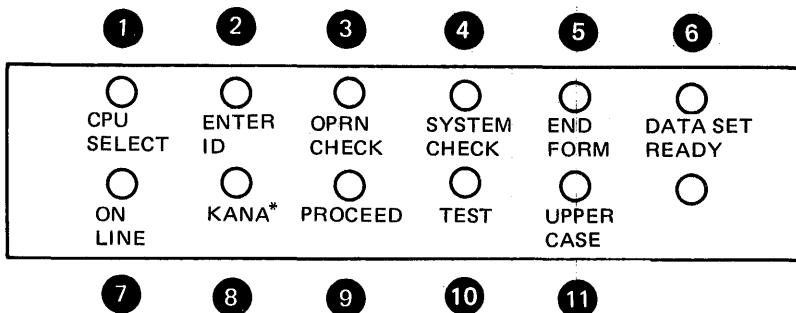
Chapter 4. Operating Controls

3767 Keyboard (Illustration)

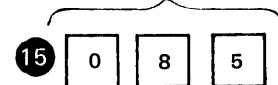


analogous to the "control" key on a TTY!

Lights (Illustration)



Three-Position Alphameric
(Print column and
error code) indicator



*Japan only

1 CPU Select

This light indicates the following conditions, under the specified line control:

- SDLC--The CPU wishes to send a message to the terminal, and the terminal is in transmit state. The operator should end transmission by pressing the EOM key, to enable the CPU to transmit its message. The light goes off when the terminal starts to receive the message.
- 2740-2 Start-Stop*--The terminal was addressed by the CPU while the terminal was in the enter, bid, or buffer print state of communicate mode or while it was in local mode. The light goes off when a positive answer is returned for addressing. This is accomplished when any one of the following occurs:
 - Bid state is terminated by a CPU poll
 - Buffer print state ends
 - The terminal is switched from local to communicate mode
- Enter state is ended when the Reset Key is pressed.

*This light serves the same purpose as the 2740-2 Attention light.

2 Enter ID

This light indicates that the operator's identification may be entered and transmitted without being printed. This identification may be entered from the keyboard or from a magnetic stripe ID card. The light is turned on by a CPU message requesting the operator's ID. Such a message includes the print inhibit code, to prevent printing the operator's ID. The light goes off when a message from the CPU enables printing.

3 Operation Check

This light indicates that an operational error has occurred. Operator intervention is required to correct the situation. The following conditions cause this light to come on:

1. An error is detected while a magnetic stripe card is being read; the Proceed light remains on. Press the Reset key to turn the Operation Check Light off, and reread the card.
2. An invalid character or value is detected during a vertical format setting operation; the Proceed light remains on. Press the Reset key and reenter the corrected parameters.
3. The following keyboard operation errors cause the Operation Check light to come on:
 - a. If the Backspace key is pressed when the printhead is at column 1
 - b. If any data key or the Space or the Tab key is pressed when the printhead is at column 132
 - c. If the Horizontal Tab key or the Vertical Tab key is pressed after the final tab stop setting has been passed
 - d. If the Index or the Return key is pressed when the form is at the bottom margin (if the VFC special feature is installed)
 - e. If the Buffer Line Return or the Buffer Backspace key is pressed when the edit pointer is at the beginning of the buffer
 - f. If the Buffer Backspace key is pressed when the preceding character is the NL or FF character
 - g. If invalid function key combinations (Code key plus data keys) are pressed
 - h. If an attempt is made to edit or to print secure data in the buffer; secure data is data that is print-inhibited.

4 System Check

This light is turned on by three classes of error conditions:

1. Network errors
2. Line errors
3. Machine checks

These error conditions are described in the following text.

Network Errors

The System Check light comes on when the terminal receives network error status sense information from the CPU, in response to the terminal's transmission. The Reset key may be pressed to turn off the light. The CPU then transmits a message resetting the network error and stating the restart procedure.

Line Errors

The following line errors, under the specified line control, turn on the System Check light:

Line Break (SDLC line control): No line activity is detected in more than 20 seconds. The System Check light can be turned off by pressing the Reset key or by receiving any information from the CPU.

VRC, no-stop bit, or buffer overflow (2741 line control): Any of these errors turn on the System Check light. An error graphic is also printed, in place of the character in error, for VRC and no-stop bit errors. The audible alarm sounds for approximately 60 seconds when a buffer overflow occurs. The System Check light and the audible alarm can be turned off by pressing the Reset key.

VRC/LRC, no-stop bit, a **(N)** received after transmission, or buffer overflow (2740-1 and -2 line control): Any of these errors turn on the System Check light. An error graphic is also printed if a **(N)** is received (2740-1 only). The audible alarm sounds for approximately 60 seconds when a buffer overflow occurs. The System Check light and the audible alarm can be turned off by pressing the Reset key.

(N) received for five successive transmissions of the same message (2740-2 line control): This error turns on the System Check light. The light can be turned off by pressing the Reset key.

Machine Check

Hardware logic errors turn on the System Check light. To turn the light off under these conditions, a power-on reset is necessary. This is done by turning the Power On/Off switch off momentarily, then turning it on again.

5 End of Form

This light operates in conjunction with the End-of-Forms detector. When it is on, it indicates that the terminal has run out of forms. To turn off the light, the operator should:

Press the Code and the Form Load keys simultaneously, to move the printhead out of the forms path

Load the required forms (the light will go off).

Press the Code key and the Form Ready key simultaneously, to move the printhead back to the original print position. The End-of-Forms detector should be deactivated by the end-of-form detector mechanical slide switch when singlesheet forms or stationery is used.

6 Data Set Ready

This light indicates that the data communications equipment is operational.

7 On Line

This light indicates that the terminal is in session (SDLC line control). It also indicates that the terminal is either receiving or transmitting data. It goes off when:

- The terminal is receiving or transmitting a message segment
- The Communicate/Local switch is set to the LOCAL position.

8 KANA

This light is available with the KATAKANA keyboard and is on when the keyboard is in either the KATAKANA or KANA symbol shift.

9 Proceed

This light indicates that the operator can enter data from the keyboard or from the magnetic stripe reader. The terminal may be in either communicate or local mode. The light will be on, under SDLC line control, when:

1. The Communicate/Local switch is set to the LOCAL position
2. The terminal is not in the receive state of communicate mode and the buffer is available for data entry
3. The Sys Req key is pressed.

This light is on, under 2740-1 or -2 or 2741 line control, whenever the operator can enter data from the keyboard.

The light is off, under SDLC line control, when:

1. The Communicate/Local switch is set to COMM from LOCAL
2. The terminal changes to the receive state, from either the standby or transmit state.
3. The terminal is waiting for a positive acknowledgment, when it is in transmit state
4. A buffer full condition occurs during data entry
5. The keyboard is locked
6. An end-of-forms condition occurs.

10 Test

This light indicates that the automatic test procedure is operating. An error-free test is indicated when the Test light goes off and the Proceed light comes on (all other lights will be off). A test error is indicated when the Test light is on and a combination of other lights remains on. The combination of lights that remain on depends upon the test error.

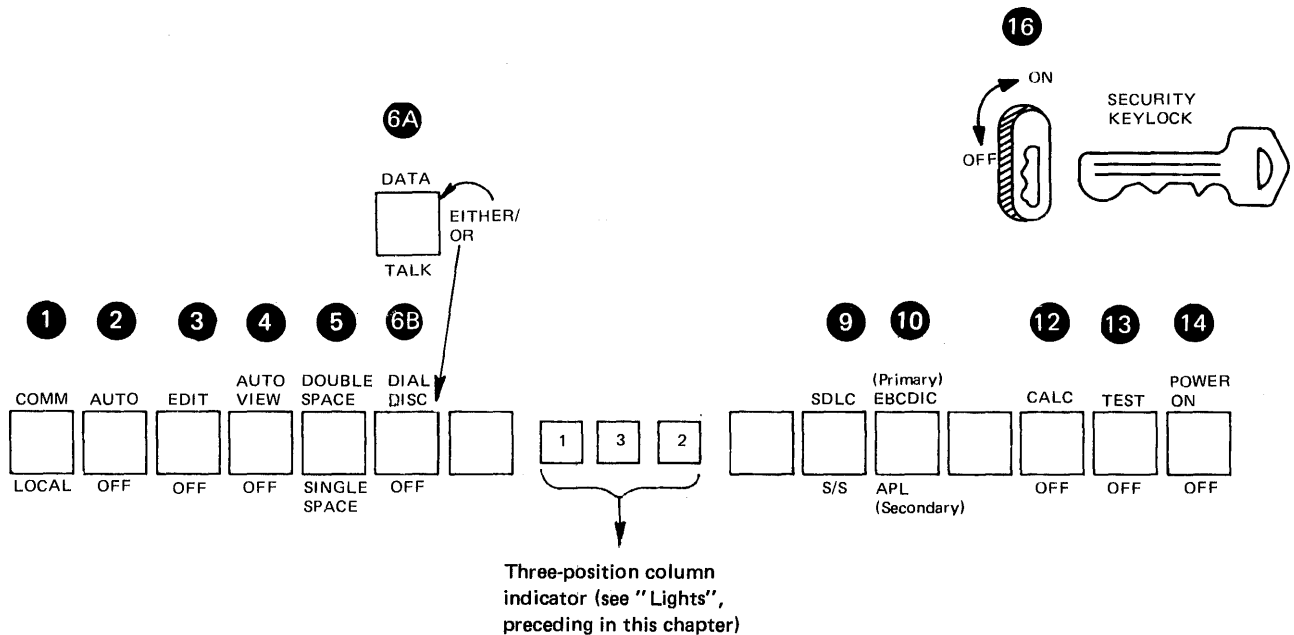
11 Upper Case

This light indicates that the keyboard is in uppercase.

15 Three - Position Alphameric (Column) Indicator

This indicator normally shows the printer's next print position. Under error conditions (when the System Check light or the Test light is on), it shows the error code.

Switches (Illustration)



1 *Communicate/Local (COMM/LOCAL) (Standard)*

This switch places the terminal in either local or communicate mode. It is operable at any time except when the terminal is in local mode with the Calculate switch set to CALC. The Calculate switch must be turned off before the terminal is changed from local to communicate mode.

2 *Auto (Standard)*

With this switch in the ON position, the 3767 has the following transmission characteristics:

- A message containing up to one line of data can be entered from the keyboard.
- The Carrier Return key causes transmission of the buffer contents and the 'end of message' (EOM) signal, in addition to the 'new line' (NL) signal.
- The Form Feed Key causes transmission of the buffer contents and the 'end of message' (EOM) signal.
- The EOB and EOM Keys cause transmission of the buffer contents.

With this switch in the OFF position, the 3767 has the following transmission characteristics:

- Multiple blocks of multiple-line messages can be entered from the keyboard.
- The EOB key causes transmission of the 'EOB' signal to the CPU. This does not give the CPU an opportunity to transmit.
- The EOM key causes transmission of the 'EOM' signal to the CPU. This gives the CPU an opportunity to transmit.

3 *Edit (Buffered SDLC, 2740-2)*

This switch enables total text editing during a keyboard-to-printer operation, when the terminal is in local mode. Buffered data that is edited when the 3767 is in local mode may be printed to obtain clean copy, but cannot be transmitted. In communicate mode, this switch suppresses automatic transmission of a message segment so that a full buffer segment can be edited before it is transmitted.

4 *Auto View (Standard)*

When this switch is set to AUTO VIEW, the printhead automatically moves to the right, from the last character printed during keyboard data entry. This makes it possible for each key entry to be visually verified before the next key is pressed. Auto view is active in communicate mode, when the terminal is in the transmit state, and in local mode, during keyboard-to-printer operations. Auto View does not function past print position 124.

5 *Double Space/Single Space (Standard)*

This switch causes single (6 print lines per inch) or double (3 print lines per inch) line feed, when it is set to the desired position.

6A *Data/Talk (World Trade Only)*

This switch is used to disconnect the terminal from a switched network. Either this switch or the Dial Disc switch (described next) may be specified, but not both.

6B *Dial Disc (World Trade Only)*

This switch is a momentary-type switch. When it is momentarily set to the DIAL DISC position, it causes the terminal to be disconnected from a switched network. Before this switch is operated, the communicating session must be terminated by either the CPU or the terminal.

9 *SDLC/SS (Start-Stop Feature)*

This switch selects the line control desired, either SDLC or start-stop. It must be set to the desired line control before power is turned on, since it functions to change the line control only during the power-on sequence. After power is up, changing the switch setting has no effect on line control.

10 *Primary/Secondary (Alternate Character Set Feature)*

This switch enables the user of a 3767 with the Alternate Character Set feature installed to change character sets by setting the switch to the desired position. This switch must be set before power is turned on. A card may be ordered which illustrates the alternate character set with decals. These decals may be removed from the card and attached to the front of the appropriate keys.

12 *Calculation (Calculate-Scientific Feature)*

This switch is operative when the terminal is in local mode. When it is set to the CALC position, the terminal can be used as a desk calculator.

13 *Test (Standard)*

This switch is a momentary-type switch and is operable at any time. When it is momentarily set to the ON position, it causes all lights except the Upper Case, Data Set Ready, and End Form lights to come on, and when it is released, it causes the terminal's automatic test procedure to test the terminal. When the test has been completed, the terminal returns to the same condition as after a power-on reset. This switch should normally be used when the 3767 is in local mode, to avoid possible communication interference.

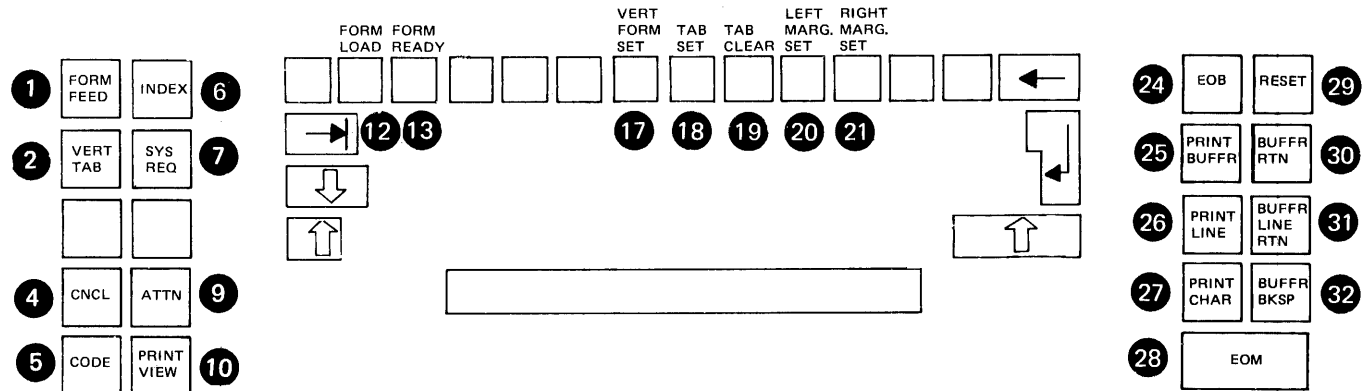
14 Power (Standard)

This switch, when turned on, supplies power to the 3767; it also initiates a power-on reset. Power is turned off at the terminal when this switch is set to the OFF position.

16 Security Key Lock (Special Feature)

This key-switch, when not turned on, prevents unauthorized use of the terminal. Each terminal has a unique key.

Keys (Illustration)



Keyboard Control Keys

- Shift (↑)
- Lock (↓)
- Print Control Keys*
- Return (↵)
- Space ()
- Backspace (←)
- Index (⇐)
- Tab (⇨)
- Form Feed
- Vertical Tab (VERT TAB)
- Print View

Reset Key
Reset

Communication Control Keys

- Return (↵)
- Form Feed
- End of Block (EOB)
- End of Message (EOM)
- Attention (ATTN)
- Cancel (CNCL)
- System Request (SYS REQ)

Combination Function Keys

- Press the CODE Key and one of the following Keys:
- Form Load
- Form Ready
- Vertical Form Set (VERT FORM SET)
- Tab Set
- Tab Clear
- Left Margin Set
- Right Margin Set

Buffer Editing Keys

- Print Buffer
- Print a Line (PRINT LINE)
- Print a Character (PRINT CHAR)
- Buffer Return (BUFFER RTN)
- Buffer Line Return (BUFFER LINE RTN)
- Buffer Backspace (BUFFER BKSP)

1 Form Feed (VFC Feature)

This key, when pressed, causes the paper to advance to the left margin of the first print line of the next page. It also transmits the form feed (FF) code, if the terminal is in transmit status. Under SDLC line control with the Auto switch on, this key also performs the function of the EOM key.

2 *Vertical Tab (VFC Feature)*

This key, when pressed, causes the paper to advance to the next VFC position. It also transmits the vertical tab (VT) code, if the terminal is in transmit status. The print column position does not change. If no VFC positions are defined, a line feed occurs, and the VT code is transmitted. If this key is pressed when the form is past the last VFC position, the Operation Check light comes on.

4 *Cancel*

This key, when pressed while the terminal is in the receive state, stops the printing and transmits an error response to the CPU. When it's pressed while the terminal is in the transmit state, this key causes transmission of the cancel signal to the CPU and also clears the buffer.

5 *Code*

This key is used in conjunction with certain other data keys. These data keys have their code function printed on the terminal case just above the key, as follows:

Form Load	Tab Set
Form Ready	Tab Clear
	Left Margin Set
Vert Form Set	Right Margin Set

To activate these data key code functions, press the desired data key while pressing the Code key. Refer to the descriptions of these Keys, following in this chapter.

6 *Index*

This key, when pressed, causes the form to advance one line and also causes the Line Feed (LF) code to be generated. When the VFC feature is installed, if this key is pressed when the form is positioned at the bottom margin, the form does not advance, and the Operation Check light comes on.

7 *System Request*

This key, when pressed, does the following, according to the specified line control that is being used:

- 2740-1 Point-to-Point*--Causes the terminal, when it is in standby status, to transmit an 'end of address' signal; the terminal then shifts to transmit status.
- 2740-1 Station Control*--Places the terminal in bid status and turns off the Proceed light. An audible tone sounds, and the Proceed light comes on when the terminal is polled.
- 2740-2*--Turns off the Proceed light and causes the buffer contents to be transmitted, when the terminal is polled. After completing the transmission, the terminal enters standby status, and the Proceed light comes on.
- SDLC--Causes the terminal, through predefined procedures, to communicate with the CPU for various services, such as: initiating communications and terminating communications.

*The function of this key is the same as that of the Bid key on the 2740 terminals.

3 *Attention*

This key, when pressed, does the following, according to the specified line control:

- 2740-2--Provides the same function as the 2740-2 Enter key.
- 2741--Causes an 'end-of-transmission' signal (when the terminal is in transmit status) or an 'interrupt' signal (when the terminal is in receive status) to be transmitted.
- SDLC--Causes an asynchronous signal to be transmitted to the CPU, regardless of the terminal's state. The use of this information depends upon the customer's application.

10 *Print View*

This key, when pressed during a keyboard data entry operation, causes the print head to move to the right so that the last character entered is visible. The mechanical print position indicator is also aligned with the next print position. Print view does not function past print position 124. The print head returns to the correct printing position when a character key is pressed.

12 *Form Load*

This key must be used in conjunction with the Code key. When the Code and Form Load keys are pressed simultaneously, the print head moves to the left so that a new form can be loaded. To increase ribbon life, these keys should be pressed before power is turned off.

13 *Form Ready*

This key must be used in conjunction with the Code key. When the Code and Form Ready keys are pressed simultaneously, the print head moves to the position it occupied before the Form Load key was pressed.

17 *Vertical Form Set (VFC Feature)*

This key must be used in conjunction with the Code key, to provide the vertical format function. This function is available only with the VFC feature.

When the Code and Vertical Form Set keys are pressed simultaneously, the terminal enters vertical format setting status. The page size (total number of print lines), VFC vertical tab positions, and the bottom margin may then be specified. See "Vertical Form Control" in "Chapter 3. Special Features" for details.

18 *Tab Set*

This key must be used with the Code key. When the Code and Tab Set keys are pressed simultaneously, a tab stop is set at the current position indicated by the column indicator.

19 *Tab Clear*

This key must be used with the Code key. When the Code and Tab Clear keys are pressed simultaneously, the tab stop at the current position indicated by the column indicator is cleared.

20 *Left Margin Set*

This key must be used with the Code key. When the Code and Left Margin Set keys are pressed simultaneously, the left margin is set at the current position indicated by the column indicator. This automatically clears any previous setting of the left margin.

21 *Right Margin Set*

This key must be used with the Code key. When the code and Right Margin Set keys are pressed simultaneously, the right margin is set at the current position indicated by the column indicator. This automatically clears any previous setting of the right margin.

24 *End of Block*

This key, when pressed, does the following, under the specified line control:

- SDLC--Transmits all buffered data. The operator can continue to key in data as long as the Proceed light is on.
- 2740-1--Transmits an 'end of message block' signal to the CPU, which causes the CPU to check the message block. The operator can key in more data after receiving a positive acknowledgment from the CPU to the previously transmitted data.
- 2740-2--(Same as for 2740-1).

25 *Print Buffer (Buffer Feature)*

This key, when pressed, causes the contents of the buffer between the edit pointer and the current pointer, to be printed. If this key is pressed immediately after the Buffer Return key is pressed, the entire buffer, up to the current pointer, will be printed.

26 *Print Line (Buffer Feature)*

This key, when pressed, causes the contents of the buffer between the edit point and the next NL code character, to be printed. If the edit and current pointers are on the same line, the printout will stop at the location of the current pointer.

27 *Print Character (Buffer Feature)*

This key, when pressed, causes the buffer character at the edit pointer's position to be printed. This key is a typamatic key.

28 *End of Message*

This key, when pressed, does the following, according to the specified line control:

- SDLC--Causes all buffered data and End of Message information to be transmitted to the CPU. The keyboard condition (locked or unlocked) is specified at the beginning of communications. For example, a keyboard condition might be specified as:
 - Permitting continuous entry of data from the keyboard, as long as no error or exception condition is detected
 - Permitting additional entry of data from the keyboard when a positive acknowledgment has been received for the previous message segment
 - Remaining locked after receiving a message from the CPU.
- 2740-1 or 2740-2--Informs the CPU that the terminal has completed transmitting. The terminal then enters standby status, and the keyboard is locked.

29 *Reset*

This key, when pressed, does the following, according to the specified line control:

- SDLC and 2741--Turns off the Operation Check light and/or the System Check light, if either of these are on.
- 2740-1/2--Performs the same functions as the Reset keys on the 2740-1 and 2740-2 terminals.
- 2741--Resets error conditions detected while the terminal is receiving data.

30 *Buffer Return*

This key, when pressed, causes the edit pointer to point to the first position of the buffer. It also causes the printer to start a new line.

31 *Buffer Line Return (Buffer Feature)*

This key, when pressed, causes the following to occur:

- The edit pointer points to the first position of the current line.
- A new print line is started.

Each additional pressing of this key causes the edit pointer to go back by one line. The Operation Check light comes on if the operator attempts to go back past the beginning of the buffer. The light goes off if the Reset key, any data key, or one of the print keys is pressed.

32 *Buffer Backspace*

This key, when pressed, causes the following to occur:

- The edit pointer decrements by one position.
- The print position decrements by one position.

If the operator backspaces over an NL or FF code or past the beginning of the buffer, the Operation Check light comes on. The light goes off if the Reset key, any data key, or any other buffer key (except Buffer Line Return) is pressed.

Chapter 5. World Trade Considerations

Special consideration has been given to the unique requirements of World Trade countries, as described in the following text.

Power Supply

Power supplies for the 3767 are available to match the following power sources:

100Vac	}	50Hz
110/112.5Vac		
123.5Vac		
220Vac		
235/240Vac		
100Vac	}	60Hz
115Vac		
220Vac		

Keyboard and Printer Requirements

The following keyboard nomenclature is available:

APL (USA)*	Finland
APL (WT)*	France
Correspondence (USA)	Italy
EBCDIC (USA)	Kata Kana
International EBCDIC (WT)	Norway
Austria/Germany	Portugal
Belgium	Spain
Brazil	Spanish-Speaking
Denmark	Sweden
	United Kingdom

*Decals only (alternate character set).

Refer to Appendix A, following in this manual, for illustrations of these keyboards.

Appendix A. Keyboard Layouts and Code Charts

Keyboards

Variations in keyboard layout are shown on the following pages.

On some keyboards for World Trade countries, certain character graphics are missing, whose line codes are required for start-stop operation. The codes for these characters may be transmitted by pressing the key, whose number is shown in parentheses following "Missing Characters" for that keyboard.

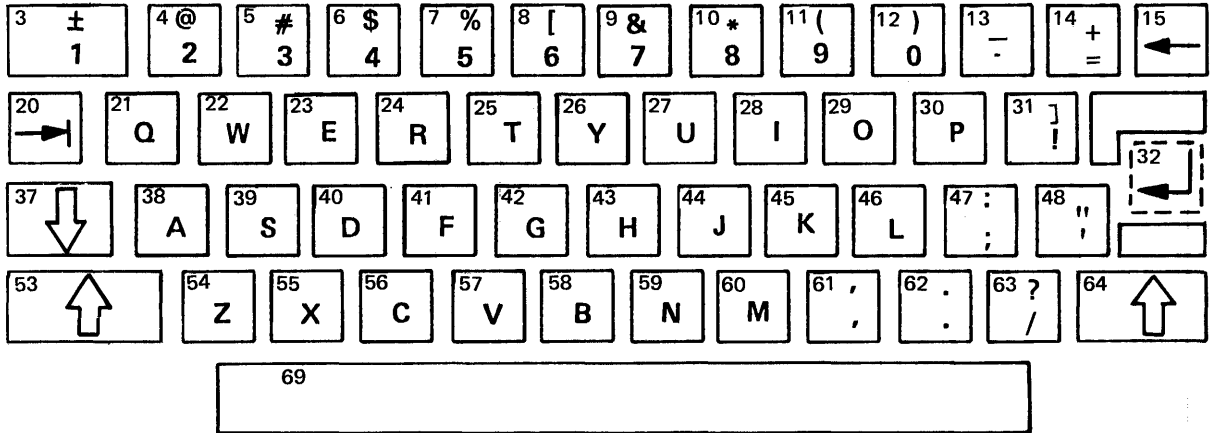


Figure A-1. CORRESPONDENCE (USA)

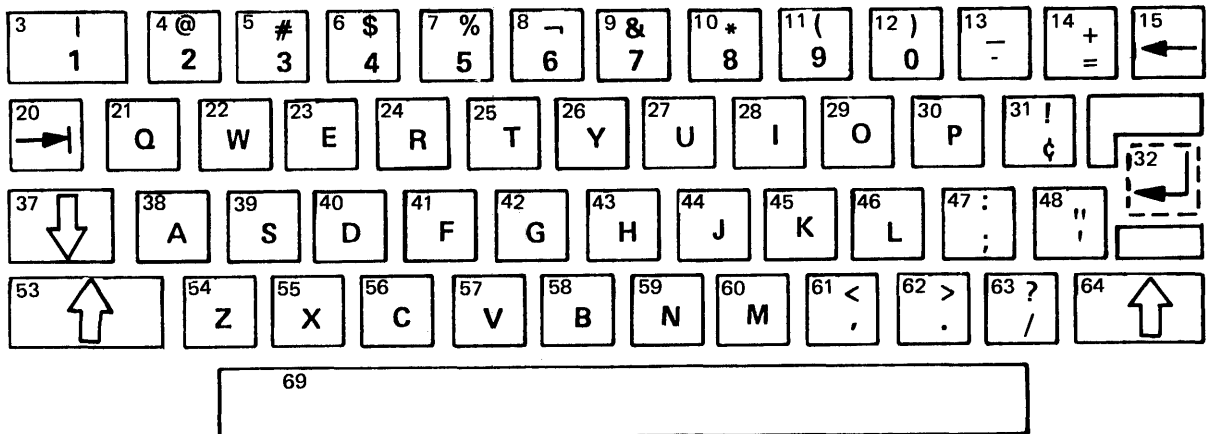
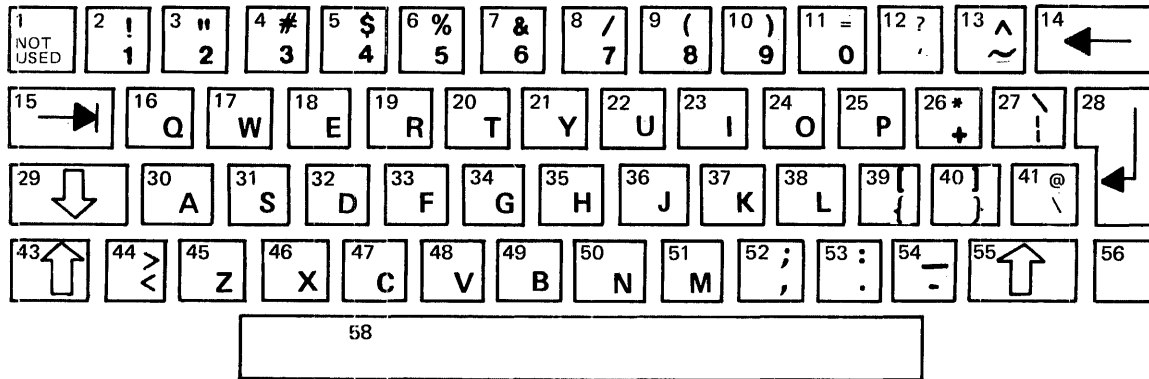
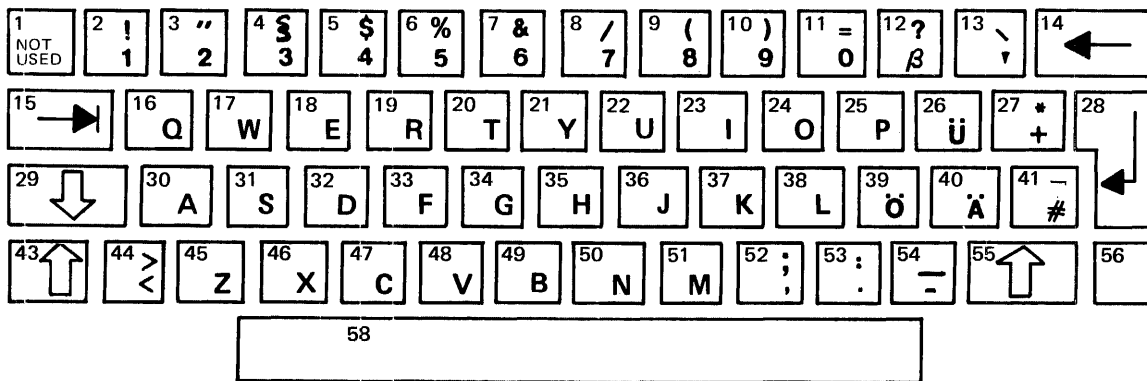


Figure A-2. EBCDIC (USA)



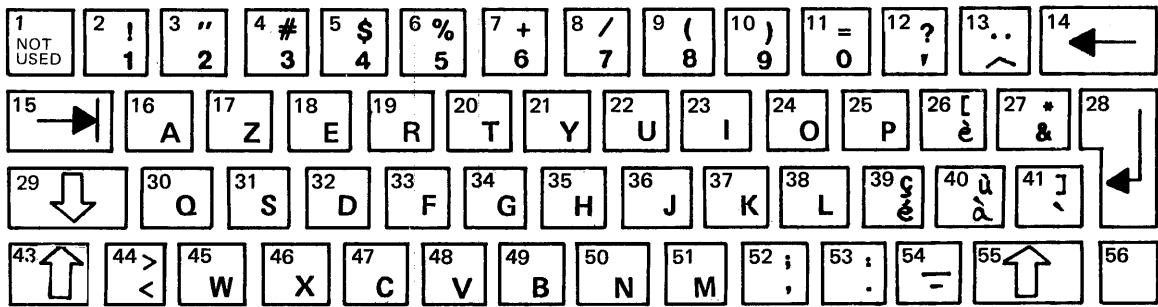
With start-stop line control:
 Missing Characters: I (27L) ¢ (39U) (13U)
 Inactive Characters: ~ \ | [] { } ` ^

Figure A-3. INTERNATIONAL EBCDIC (World Trade)



With start-stop line control:
 Missing Characters: I (4U) @ (39L) ¢ (39U)
 Inactive Characters: ß ' Š Ä ü ö

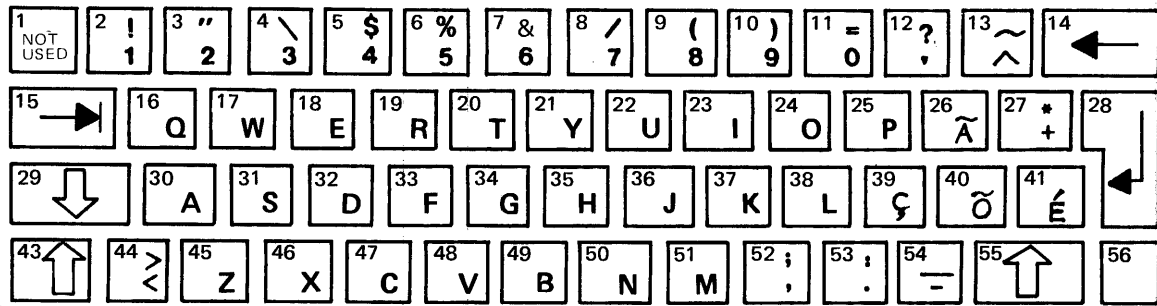
Figure A-4. AUSTRIA/GERMANY



58

With start-stop line control:
 Missing Characters: | (4IU)
 Inactive Characters: | (2U) → (13L) ¢ (40U) @ (40L)
 .. ^ ù ç è [à] `

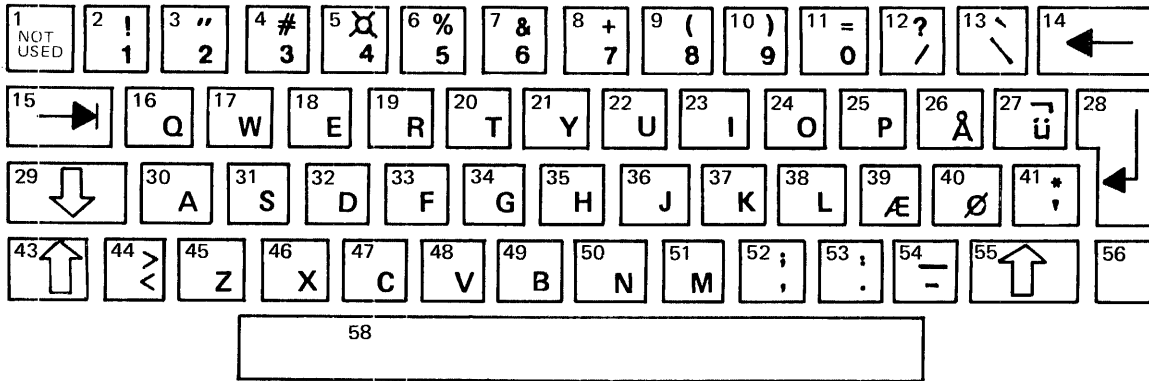
Figure A-5. BELGIUM



58

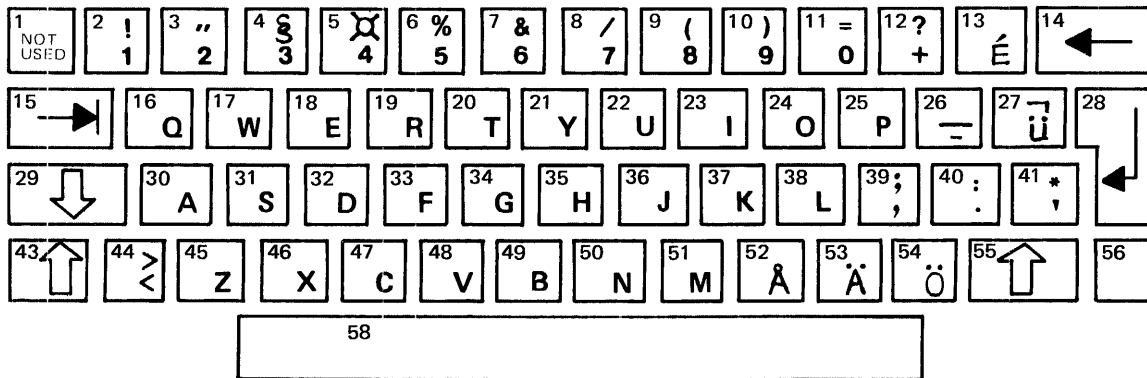
With start-stop line control:
 Missing Characters: | (2U) → (13L)
 Inactive Characters: \
~ " \$ É ! ^

Figure A-6. BRAZIL



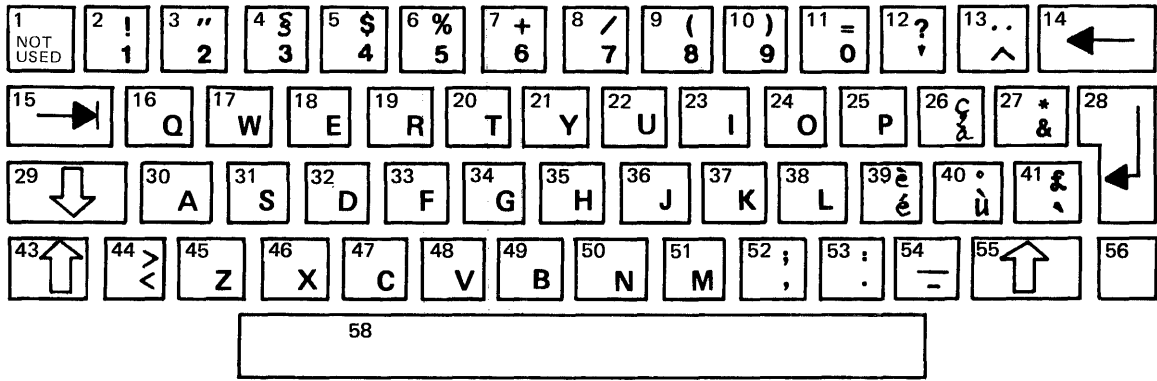
With start-stop line control:
 Missing Characters: none
 Inactive Characters: \ ' ü " # Å

Figure A-7. DENMARK



With start-stop line control:
 Missing Characters: none
 Inactive Characters: É ü " § Å

Figure A-8. FINLAND



With start-stop line control:

Missing Characters:

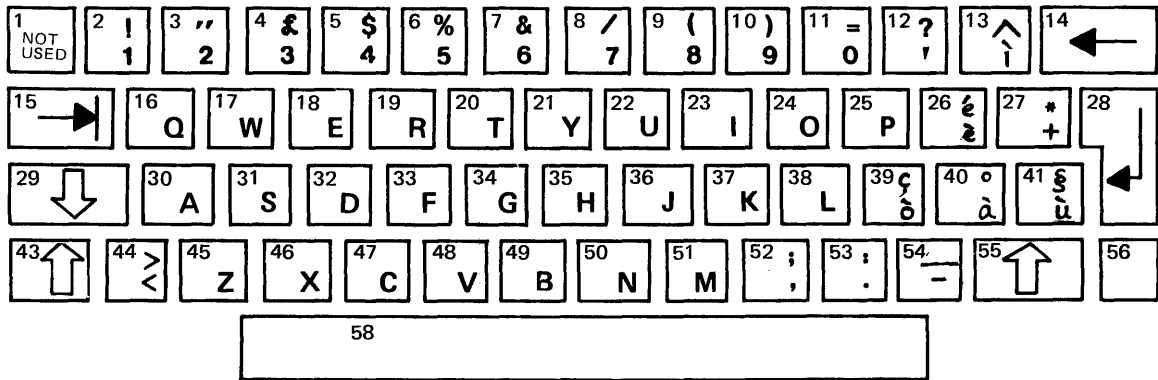
⊙ (26L) ! (4U)

¢ (40U) † (2U) ¬ (13L) # (41U)

Inactive Characters:

à ¤ ° ^ § ç é ù è · \

Figure A-9. FRANCE



With start-stop line control:

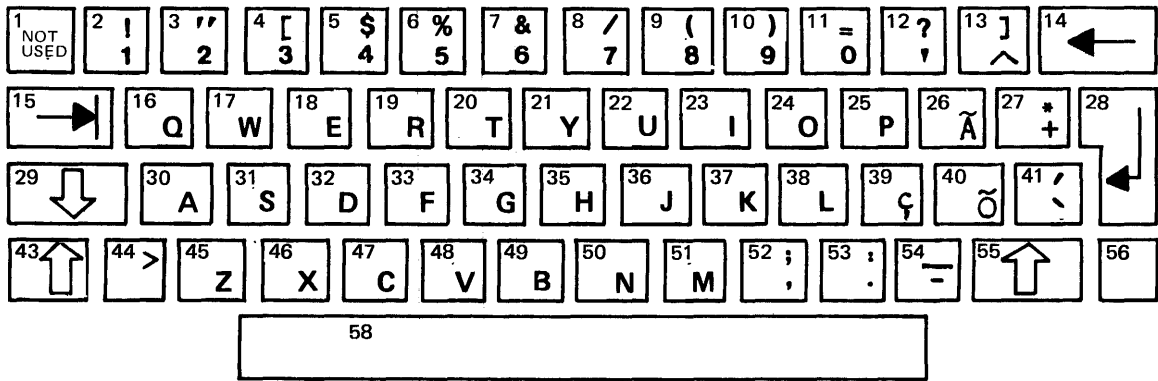
Missing Characters:

(4U) † (2U) ¬ (13U) @ (40L) ¢ (40U) ! (41U)

Inactive Characters:

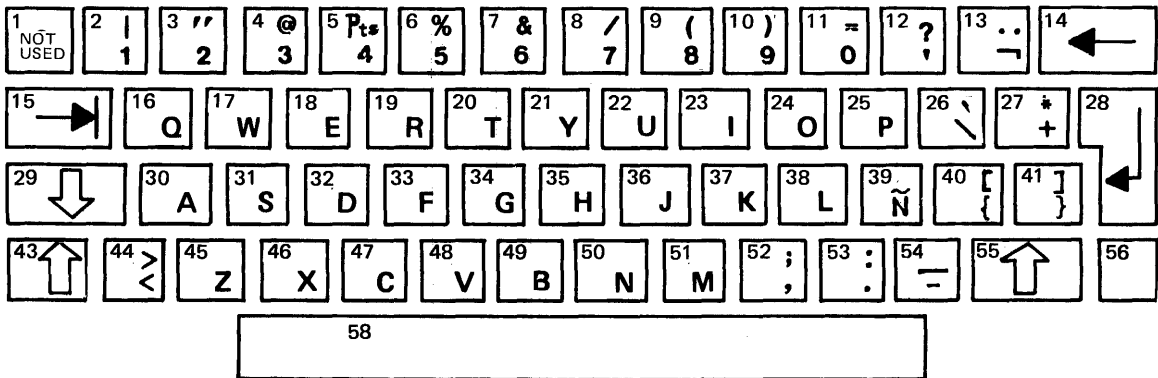
£ ì é è ç ò ° à § ù ^

Figure A-10. ITALY



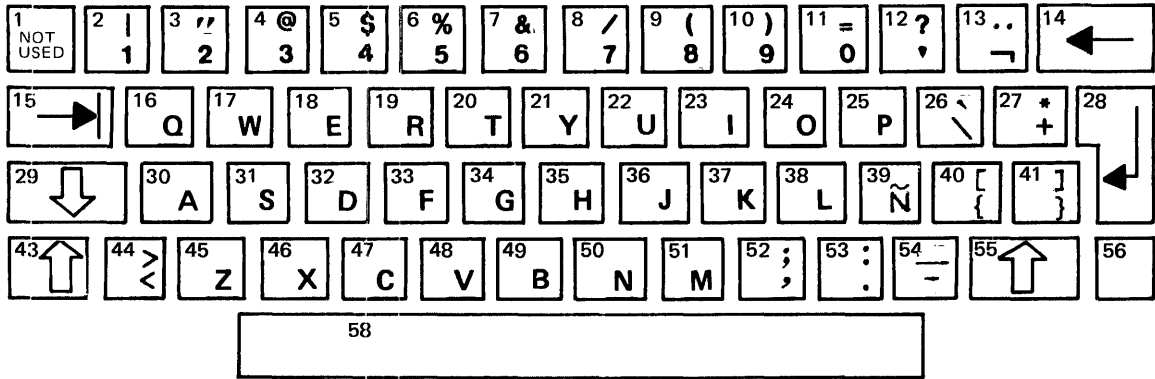
With start-stop line control:
 Missing Characters: ¡ (13U) ¸ (13L) (4U)
 Inactive Characters: [] ` ^

Figure A-13. PORTUGAL



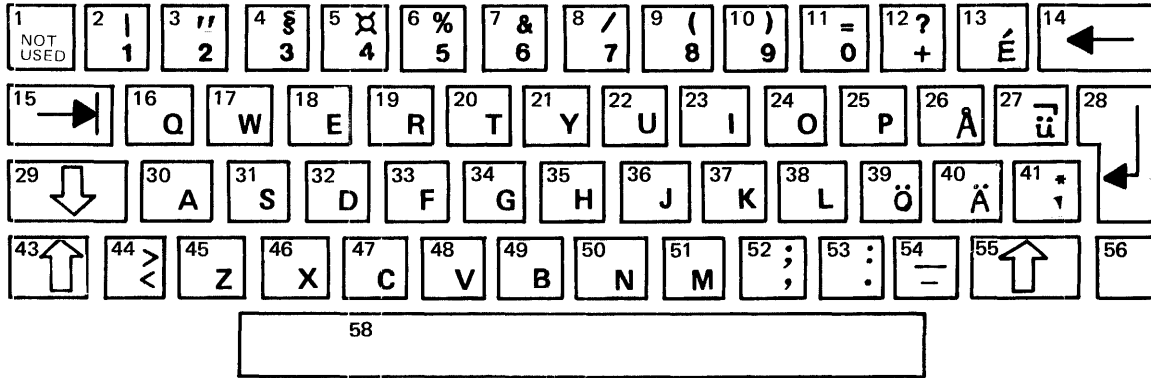
With start-stop line control:
 Missing Characters: ¡ (41U) ¢ (40U)
 Inactive Characters: { } .. \ [] "

Figure A-14. SPAIN



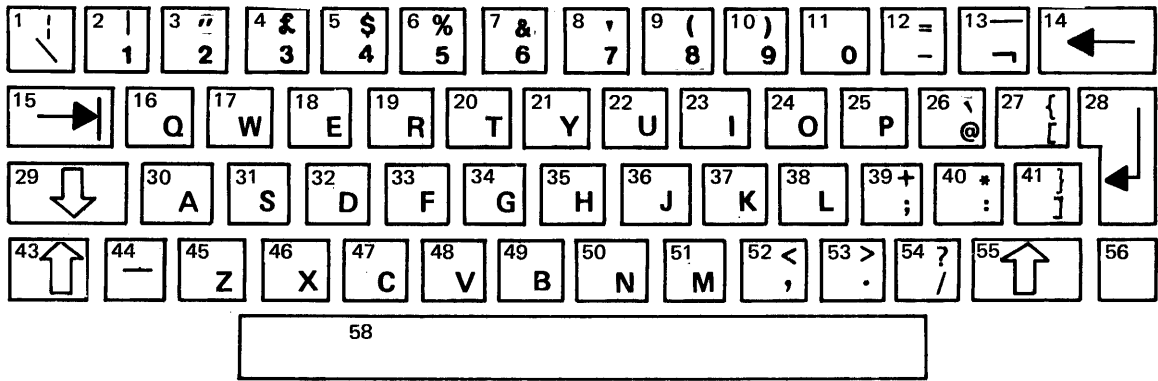
With start-stop line control:
 Missing Characters: ! (41U) ¢(40U)
 Inactive Characters: { } ·· \ " []

Figure A-15. SPANISH SPEAKING



With start-stop line control:
 Missing Characters: none
 Inactive Characters: É ü " § ⌘

Figure A-16. SWEDEN



With start-stop line control:

Missing Characters:

Inactive Characters:

#(27L)!(41L)

{ } ' \ - [] !

Figure A-17. UNITED KINGDOM

Code Charts

Legend:

- KBD = Key Position
- GRAP = Graphic
- EBCDIC = EBCDIC Line Code (Hex)
- S = Shift
- S-S LC = Start-Stop Line Code
- NU = Not Used
- IA = Inactive

KBD	Lowercase			Uppercase		
	GRAP	S	S-S-LC	GRAP	S	S-S-LC
3	1	L	1	ˆ	U	1
4	2	L	2	˘	U	2
5	3	L	21C	<	U	21C
6	4	L	4	≤	U	4
7	5	L	41C	≡	U	41C
8	6	L	42C	≥	U	42C
9	7	L	421	>	U	421
10	8	L	8	∕	U	8
11	9	L	81C	∨	U	81C
12	0	L	82C	^	U	82C
13	+	L	B	-	U	B
14	x	L	BAC	∴	U	BAC
21	Q	L	B8C	?	U	B8C
22	W	L	A42	ω	U	A42
23	E	L	BA41C	ε	U	BA41C
24	R	L	B81	ρ	U	B81
25	T	L	A21	~	U	A21
26	Y	L	A8C	†	U	A8C
27	U	L	A4C	‡	U	A4C
28	I	L	BA81C	‡	U	BA81C
29	O	L	B42	⊙	U	B42
30	P	L	B421C	*	U	B421C
31	←	L	A	→	U	A
38	A	L	BA1	α	U	BA1
39	S	L	A2C	┌	U	A2C
40	D	L	BA4	└	U	BA4
41	F	L	BA42C	—	U	BA42C
42	G	L	BA421	∇	U	BA421
43	H	L	BA8	Δ	U	BA8
44	J	L	B1C	◦	U	B1C
45	K	L	B2C	◦	U	B2C
46	L	L	B21	□	U	B21
47	[	L	B821C	(	U	B821C
48	]	L	821	)	U	821
54	Z	L	A81	c	U	A81
55	X	L	A421C	∩	U	A421C
56	C	L	BA21C	∩	U	BA21C
57	V	L	A41	U	U	A41
58	B	L	BA2	⊥	U	BA2
59	N	L	B41	T	U	B41
60	M	L	B4C	!|	U	B4C
61	'	L	A821C	∴	U	A821C
62	•	L	BA821	∴	U	BA821
63	/	L	A1C	\	U	A1C

Figure A-18. Code Chart-APL

KBD	Lowercase			Uppercase		
	GRAP	S	S-SLC	GRAP	S	S-SLC
1	NU	-	-----	NU	-	-----
2	1	L	1	-	U	1
3	2	L	2	<	U	2
4	3	L	21C	<=	U	21C
5	4	L	4	=	U	4
6	5	L	41C	=>	U	41C
7	6	L	42C	>	U	42C
8	7	L	421	>#	U	421
9	8	L	8	v	U	8
10	9	L	81C	v^	U	81C
11	0	L	82C	-	U	82C
12	+	L	B	-	U	B
13	x	L	BAC	÷	U	BAC
16	Q	L	B8C	?	U	B8C
17	W	L	A42	ω	U	A42
18	E	L	BA41C	ε	U	BA41C
19	R	L	B81	ρ	U	B81
20	T	L	A21	~	U	A21
21	Y	L	A8C	↑	U	A8C
22	U	L	A4C	↓	U	A4C
23	I	L	BA81C	↑↓	U	BA81C
24	O	L	B42	o	U	B42
25	P	L	B421C	*	U	B421C
26	←	L	A	→	U	A
27	NU	-	-	NU	-	-
30	A	L	BA1	α	U	BA1
31	S	L	A2C	Γ	U	A2C
32	D	L	BA4	L	U	BA4
33	F	L	BA42C	∇	U	BA42C
34	G	L	BA421	∇	U	BA421
35	H	L	BA8	Δ	U	BA8
36	J	L	B1C	°	U	B1C
37	K	L	B2C	•	U	B2C
38	L	L	B21	□	U	B21
39	[	L	B821C	(	U	B821C
40	]	L	821	)	U	821
41	NU	-	-	NU	-	-
44	NU	-	-	NU	-	-
45	Z	L	A81	Ɔ	U	A81
46	X	L	A421C	∩	U	A421C
47	C	L	BA21C	∩	U	BA21C
48	V	L	A41	∩	U	A41
49	B	L	BA2	⊥	U	BA2
50	N	L	B41	T	U	B41
52	M	L	B4C	!|	U	B4C
52	,	L	A821C	;	U	A821C
53	.	L	BA821	;	U	BA821
54	/	L	A1C	\	U	A1C
56	NU	-	-	NU	-	-

Figure A-19. Code Chart-World Trade Countries-APL

KBD	Lowercase				Uppercase			
	GRAP	EBCDIC	S	S-SLC	GRAP	EBCDIC	S	S-SLC
3	1	F1	L	1	+	9E	U	1
4	2	F2	L	2	@	7C	U	2
5	3	F3	L	21C	#	7B	U	21C
6	4	F4	L	8	\$	5B	U	8
7	5	F5	L	4	%	6C	U	4
8	6	F6	L	42C	[	4A	U	42C
9	7	F7	L	41C	&	50	U	41C
10	8	F8	L	421	*	5C	U	421
11	9	F9	L	821	(	4D	U	821
12	0	F0	L	81C	)	5D	U	81C
13	-	60	L	BA821	-	6D	U	BA821
14	=	7E	L	BA2	+	4E	U	BA2
21	q	98	L	BA42C	Q	D8	U	BA42C
22	w	A6	L	B821C	W	E6	U	B821C
23	e	85	L	A4C	E	C5	U	A4C
24	r	99	L	B41	R	D9	U	B41
25	t	A3	L	A	T	E3	U	A
26	y	A8	L	BA81C	Y	E8	U	BA81C
27	u	A4	L	A21	U	E4	U	A21
28	i	89	L	B42	I	C9	U	B42
29	o	96	L	B8C	O	D6	U	B8C
30	p	97	L	BA4	P	D7	U	BA4
31	!	4F	L	B	]	5A	U	B
38	a	81	L	B421C	A	C1	U	B421C
39	s	A2	L	B81	S	E2	U	B81
40	d	84	L	A41	D	C4	U	A41
41	f	86	L	BA21C	F	C6	U	BA21C
42	g	87	L	BA1	G	C7	U	BA1
43	h	88	L	A81	H	C8	U	A81
44	j	91	L	BAC	J	D1	U	BAC
45	k	92	L	A42	K	D2	U	A42
46	l	93	L	A8C	L	D3	U	A8C
47	;	5E	L	BA41C	:	7A	U	BA41C
48	'	7D	L	B4C	"	7F	U	B4C
54	z	A9	L	82C	Z	E9	U	82C
55	x	A7	L	A1C	X	E7	U	A1C
56	c	83	L	A421C	C	C3	U	A421C
57	v	A5	L	B21	V	E5	U	B21
58	b	82	L	A821C	B	C2	U	A821C
59	n	95	L	A2C	N	D5	U	A2C
60	m	94	L	B1C	M	D4	U	B1C
61	,	6B	L	BA421	,	6B	U	BA421
62	.	4B	L	B2C	.	4B	U	B2C
63	/	61	L	BA8	?	6F	U	BA8

Figure A-20. Code Chart-CORRESPONDENCE

KBD	Lowercase				Uppercase			
	GRAP	EBCDIC	S	S-SLC	GRAP	EBCDIC	S	S-SLC
1	NU	--	-	-----	NU	--	-	-----
3	1	F1	L	1	|	4F	U	A821C
4	2	F2	L	2	@	7C	L	A
5	3	F3	L	21C	#	7B	L	821
6	4	F4	L	4	\$	5B	L	B821C
7	5	F5	L	41C	%	6C	U	41C
8	6	F6	L	42C	]	5F	U	BA821
9	7	F7	L	421	&	50	L	BAC
10	8	F8	L	8	*	5C	U	8
11	9	F9	L	81C	(	4D	U	81C
12	0	F0	L	82C	)	5D	U	82C
13	-	60	L	B	-	6D	U	B
14	=	7E	U	1	+	4E	U	BAC
21	q	98	L	B8C	Q	D8	U	B8C
22	w	A6	L	A42	W	E6	U	A42
23	e	85	L	BA41C	E	C5	U	BA41C
24	r	99	L	B81	R	D9	U	B81
25	t	A3	L	A21	T	E3	U	A21
26	y	A8	L	A8C	Y	E8	U	A8C
27	u	A4	L	A4C	U	E4	U	A4C
28	i	89	L	BA81C	I	C9	U	BA81C
29	o	96	L	B42	O	D6	U	B42
30	p	97	L	B421C	P	D7	U	B421C
31	ø	4A	U	A	!	5A	U	B821C
38	a	81	L	BA1	A	C1	U	BA1
39	s	A2	L	A2C	S	E2	U	A2C
40	d	84	L	BA4	D	C4	U	BA4
41	f	86	L	BA42C	F	C6	U	BA42C
42	g	87	L	BA421	G	C7	U	BA421
43	h	88	L	BA8	H	C8	U	BA8
44	j	91	L	B1C	J	D1	U	B1C
45	k	92	L	B2C	K	D2	U	B2C
46	l	93	L	B21	L	D3	U	B21
47	;	5E	U	21C	:	7A	U	4
48	'	7D	U	42C	"	7F	U	821
54	z	A9	L	A81	Z	E9	U	A81
55	x	A7	L	A421C	X	E7	U	A421C
56	c	83	L	BA21C	C	C3	U	BA21C
57	v	A5	L	A41	V	E5	U	A41
58	b	82	L	BA2	B	C2	U	BA2
59	n	95	L	B41	N	D5	U	B41
60	m	94	L	B4C	M	D4	U	B4C
61	,	6B	L	A821C	<	4C	U	2
62	.	4B	L	BA821	>	6E	U	421
63	/	61	L	A1C	?	6F	U	A1C

Figure A-21. Code Chart-EBCDIC

KBD	Lowercase				Uppercase			
	GRAP	EBCDIC	S	S-SLC	GRAP	EBCDIC	S	S-SLC
1	NU	--	-	-----	NU	-----	-	-----
2	1	F1	L	1	!	4F	U	B821C
3	2	F2	L	2	"	7F	U	821
4	3	F3	L	21C	#	7B	L	821
5	4	F4	L	4	\$	5B	L	B821C
6	5	F5	L	41C	%	6C	U	41C
7	6	F6	L	42C	&	50	L	BAC
8	7	F7	L	421	/	61	L	A1C
9	8	F8	L	8	(	4D	U	81C
10	9	F9	L	81C	)	5D	U	82C
11	0	F0	L	82C	=	7E	U	1
12	'	7D	U	42C	?	6F	U	A1C
13	~	A1		IA	^	5F	U	BA821
16	q	98	L	B8C	Q	D8	U	B8C
17	w	A6	L	A42	W	E6	U	A42
18	e	85	L	BA41C	E	C5	U	BA41C
19	r	99	L	B81	R	D9	U	B81
20	t	A3	L	A21	T	E3	U	A21
21	y	A8	L	A8C	Y	E8	U	A8C
22	u	A4	L	A4C	U	E4	U	A4C
23	i	89	L	BA81C	I	C9	U	BA81C
24	o	96	L	B42	O	D6	U	B42
25	p	97	L	B421C	P	D7	U	B421C
26	+	4E	U	BAC	*	5C	U	8
27	|	6A	U	A821C	\	E0		IA
30	a	81	L	BA1	A	C1	U	BA1
31	s	A2	L	A2C	S	E2	U	A2C
32	d	84	L	BA4	D	C4	U	BA4
33	f	86	L	BA42C	F	C6	U	BA42C
34	g	87	L	BA421	G	C7	U	BA421
35	h	88	L	BA8	H	C8	U	BA8
36	j	91	L	B1C	J	D1	U	B1C
37	k	92	L	B2C	K	D2	U	B2C
38	l	93	L	B21	L	D3	U	B21
39	{	C0		IA	[	4A		IA
40	}	D0		IA	]	5A		IA
41	\	79		IA	@	7C	L	A
44	<	4C	U	2	>	6E	U	421
45	z	A9	L	A81	z	E9	U	A81
46	x	A7	L	A421C	X	E7	U	A421C
47	c	83	L	BA21C	C	C3	U	BA21C
48	v	A5	L	A41	V	E5	U	A41
49	b	82	L	BA2	B	C2	U	BA2
50	n	95	L	B41	N	D5	U	B41
51	m	94	L	B4C	M	D4	U	B4C
52	•	6B	L	A821C	;	5E	U	21C
53	•	4B	L	BA821	:	7A	U	4
54	-	60	L	B	-	6D	U	B
56	NU	--	-	-----	NU	--	-	-----

Figure A-22. Code Chart-INTERNATIONAL EBCDIC

KBD	Lowercase				Uppercase			
	GRAP	EBCDIC	S	S-SLC	GRAP	EBCDIC	S	S-SLC
1	NU	--	-	-----	NU	--	-	-----
2	1	F1	L	1	!	4F	U	B821C
3	2	F2	L	2	"	7F	U	821
4	3	F3	L	21C	\$	E0	U	A821C
5	4	F4	L	4	\$	5A	L	B821C
6	5	F5	L	41C	%	6C	U	41C
7	6	F6	L	42C	&	50	L	BAC
8	7	F7	L	421	/	61	L	A1C
9	8	F8	L	8	(	4D	U	81C
10	9	F9	L	81C	)	5D	U	82C
11	0	F0	L	82C	=	7E	U	1
12	ß	A1		1A	?	6F	U	A1C
13	r	7D	U	42C	`	79		1A
16	q	98	L	B8C	Q	D8	U	B8C
17	w	A6	L	A42	W	E6	U	A42
18	e	85	L	BA41C	E	C5	U	BA41C
19	r	99	L	B81	R	D9	U	B81
20	t	A3	L	A21	T	E3	U	A21
21	z	A9	L	A81	Z	E9	U	A81
22	u	A4	L	A4C	U	E4	U	A4C
23	i	89	L	BA81C	I	C9	U	BA81C
24	o	96	L	B42	O	D6	U	B42
25	p	97	L	B421C	P	D7	U	B421C
26	u	D0		1A	U	5B		1A
27	+	4E	U	BAC	*	5C	U	8
30	a	81	L	BA1	A	C1	U	BA1
31	s	A2	L	A2C	S	E2	U	A2C
32	d	84	L	BA4	D	C4	U	BA4
33	f	86	L	BA42C	F	C6	U	BA42C
34	g	87	L	BA421	G	C7	U	BA421
35	h	88	L	BA8	H	C8	U	BA8
36	j	91	L	B1C	J	D1	U	B1C
37	k	92	L	B2C	K	D2	U	B2C
38	l	93	L	B21	L	D3	U	B21
39	ö	6A	L	A	Ö	7C	U	A
40	ä	C0		1A	Ä	7B		1A
41	#	4A	L	821	~	5F	U	BA821
44	<	4C	U	2	>	6E	U	421
45	Y	A8	L	A8C	Y	E8	U	A8C
46	x	A7	L	A421C	X	E7	U	A421C
47	c	83	L	BA21C	C	C3	U	BA21C
48	v	A5	L	A41	V	E5	U	A41
49	b	82	L	BA2	B	C2	U	BA2
50	n	95	L	B41	N	D5	U	B41
51	m	94	L	B4C	M	D4	U	B4C
52	•	6B	L	A821C	;	5E	U	21C
53	.	4B	L	BA821	:	7A	U	4
54	-	60	L	B	-	6D	U	B
56	NU	--	-	-----	NU	--	-	-----

Figure A-23. Code Chart-AUSTRIA/GERMANY

KBD	Lowercase				Uppercase			
	GRAP	EBCDIC	S	S-SLC	GRAP	EBCDIC	S	S-SLC
1	NU	--	-	-----	NU	--	-	-----
2	1	F1	L	1	!	4F	U	A821C
3	2	F2	L	2	"	7F	U	821
4	3	F3	L	21C	#	7B	L	821
5	4	F4	L	4	\$	5B	L	B821C
6	5	F5	L	41C	%	6C	U	41C
7	6	F6	L	42C	+	4E	U	BAC
8	7	F7	L	421	/	61	L	A1C
9	8	F8	L	8	(	4D	U	81C
10	9	F9	L	81C	)	5D	U	82C
11	0	F0	L	82C	=	7E	U	1
12	•	7D	U	42C	?	6F	U	A1C
13	^	5F	U	BA821	**	A1		IA
16	a	81	L	BA1	A	C1	U	BA1
17	z	A9	L	A81	Z	E9	U	A81
18	e	85	L	BA41C	E	C5	U	BA41C
19	r	99	L	B81	R	D9	U	B81
20	t	A3	L	A21	T	E3	U	A21
21	y	A8	L	A8C	Y	E8	U	A8C
22	u	A4	L	A4C	U	E4	U	A4C
23	i	89	L	BA81C	I	C9	U	BA81C
24	o	96	L	B42	O	D6	U	B42
25	p	97	L	B421C	P	D7	U	B421C
26	è	D0		IA	[	4A	U	A
27	&	50	L	BAC	*	5C	U	8
30	q	98	L	B8C	Q	D8	U	B8C
31	s	A2	L	A2C	S	E2	U	A2C
32	d	84	L	BA4	D	C4	U	BA4
33	f	86	L	BA42C	F	C6	U	BA42C
34	g	87	L	BA421	G	C7	U	BA421
35	h	88	L	BA8	H	C8	U	BA8
36	j	91	L	B1C	J	D1	U	B1C
37	k	92	L	B2C	K	D2	U	B2C
38	l	93	L	B21	L	D3	U	B21
39	é	C0		IA	ç	E0		IA
40	à	7C	L	A	ù	6A		IA
41	\	79		IA	]	5A	U	B821C
44	<	4C	U	2	>	6E	U	421
45	w	A6	L	A42	W	E6	U	A42
46	x	A7	L	A421C	X	E7	U	A421C
47	c	83	L	BA21C	C	C3	U	BA21C
48	v	A5	L	A41	V	E5	U	A41
49	b	82	L	BA2	B	C2	U	BA2
50	n	95	L	B41	N	D5	U	B41
51	m	94	L	B4C	M	D4	U	B4C
52	•	6B	L	A821C	;	5E	U	21C
53	•	4B	L	BA821	:	7A	U	4
54	-	60	L	B	-	6D	U	B
56	NU	--	-	-----	NU	--	-	-----

Figure A-24. Code Chart-BELGIUM

KBD	Lowercase				Uppercase			
	GRAP	EBCDIC	S	S-SLC	GRAP	EBCDIC	S	S-SLC
1	NU	--	-	-----	NU	--	-	-----
2	1	F1	L	1	!	4F	U	A821C
3	2	F2	L	2	"	7F		IA
4	3	F3	L	21C	\	E0		IA
5	4	F4	L	4	\$	5A		IA
6	5	F5	L	41C	%	6C	U	41C
7	6	F6	L	42C	&	50	L	BAC
8	7	F7	L	421	/	61	L	A1C
9	8	F8	L	8	(	4D	U	81C
10	9	F9	L	81C	)	5D	U	82C
11	0	F0	L	82C	=	7E	U	1
12	•	7D	U	42C	?	6F	U	A1C
13	^	5F	U	BA821	~	A1		IA
16	q	98	L	B8C	Q	D8	U	B8C
17	w	A6	L	A42	W	E6	U	A42
18	e	85	L	BA41C	E	C5	U	BA41C
19	r	99	L	B81	R	D9	U	B81
20	t	A3	L	A21	T	E3	U	A21
21	y	A8	L	A8C	Y	E8	U	A8C
22	u	A4	L	A4C	U	E4	U	A4C
23	i	89	L	BA81C	I	C9	U	BA81C
24	o	96	L	B42	O	D6	U	B42
25	p	97	L	B421C	P	D7	U	B421C
26	ã	79	L	A	Ã	7C	U	A
27	+	4E	U	BAC	*	5C	U	8
30	a	81	L	BA1	A	C1	U	BA1
31	s	A2	L	A2C	S	E2	U	A2C
32	d	84	L	BA4	D	C4	U	BA4
33	f	86	L	BA42C	F	C6	U	BA42C
34	g	87	L	BA421	G	C7	U	BA421
35	h	88	L	BA8	H	C8	U	BA8
36	j	91	L	B1C	J	D1	U	B1C
37	k	92	L	B2C	K	D2	U	B2C
38	l	93	L	B21	L	D3	U	B21
39	ç	6A	L	B821C	Ç	5B	U	B821C
40	õ	C0	L	821	Õ	7B	U	821
41	é	D0		IA	É	4A		IA
44	<	4C	U	2	>	6E	U	421
45	z	A9	L	A81	Z	E9	U	A81
46	x	A7	L	A421C	X	E7	U	A421C
47	c	83	L	BA21C	C	C3	U	BA21C
48	v	A5	L	A41	V	E5	U	A41
49	b	82	L	BA2	B	C2	U	BA2
50	n	95	L	B41	N	D5	U	B41
51	m	94	L	B4C	M	D4	U	B4C
52	•	6B	L	A821C	;	5E	U	21C
53	•	4B	L	BA821	:	7A	U	4
54	-	60	L	B	-	6D	U	B
56	NU	--	-	-----	NU	--	-	-----

Figure A-25. Code Chart-BRAZIL

KBD	Lowercase				Uppercase			
	GRAP	EBCDIC	S	S-SLC	GRAP	EBCDIC	S	S-SLC
1	NU	--	-	-----	NU	--	-	-----
2	1	F1	L	1	|	4F	U	A821C
3	2	F2	L	2	"	7F		IA
4	3	F3	L	21C	#	4A		IA
5	4	F4	L	4	⌘	5A		IA
6	5	F5	L	41C	%	6C	U	41C
7	6	F6	L	42C	&	50	L	BAC
8	7	F7	L	421	+	4E	U	BAC
9	8	F8	L	8	(	4D	U	81C
10	9	F9	L	81C	)	5D	U	82C
11	0	F0	L	82C	=	7E	U	1
12		61	L	A1C	?	6F	U	A1C
13	\	E0		IA	`	79		IA
16	q	98	L	B8C	Q	D8	U	B8C
17	w	A6	L	A42	W	E6	U	A42
18	e	85	L	BA41C	E	C5	U	BA41C
19	r	99	L	B81	R	D9	U	B81
20	t	A3	L	A21	T	E3	U	A21
21	y	A8	L	A8C	Y	E8	U	A8C
22	u	A4	L	A4C	U	E4	U	A4C
23	i	89	L	BA81C	I	C9	U	BA81C
24	o	96	L	B42	O	D6	U	B42
25	p	97	L	B421C	P	D7	U	B421C
26	ä	D0	U	B821	Ä	5B	L	B821C
27	ü	A1		IA	Ü	5F	U	BA821
30	a	81	L	BA1	A	C1	U	BA1
31	s	A2	L	A2C	S	E2	U	A2C
32	d	84	L	BA4	D	C4	U	BA4
33	f	86	L	BA42C	F	C6	U	BA42C
34	g	87	L	BA421	G	C7	U	BA421
35	h	88	L	BA8	H	C8	U	BA8
36	j	91	L	B1C	J	D1	U	B1C
37	k	92	L	B2C	K	D2	U	B2C
38	l	93	L	B21	L	D3	U	B21
39	æ	C0	U	821	Æ	7B	L	821
40	ø	6A	U	A	Ø	7C	L	A
41	•	7D	U	42C	*	5C	U	8
44	<	4C	U	2	>	6E	U	421
45	z	A9	L	A81	Z	E9	U	A81
46	x	A7	L	A421C	X	E7	U	A421C
47	c	83	L	BA21C	C	C3	U	BA21C
48	v	A5	L	A41	V	E5	U	A41
49	b	82	L	BA2	B	C2	U	BA2
50	n	95	L	B41	N	D5	U	B41
51	m	94	L	B4C	M	D4	U	B4C
52	•	6B	L	A821C	;	5E	U	21C
53	•	4B	L	BA821	:	7A	U	4
54	-	60	L	B	-	6D	U	B
56	NU	--	-	-----	NU	--	-	-----

Figure A-26. Code Chart-DENMARK

KBD	Lowercase				Uppercase			
	GRAP	EBCDIC	S	S-SLC	GRAP	EBCDIC	S	S-SLC
1	NU	--	-	-----	NU	--	-	-----
2	1	F1	L	1	!	4F	U	A821C
3	2	F2	L	2	"	7F		IA
4	3	F3	L	21C	\$	4A		IA
5	4	F4	L	4	⌘	5A		IA
6	5	F5	L	41C	%	6C	U	41C
7	6	F6	L	42C	&	50	L	BAC
8	7	F7	L	421	/	61	L	A1C
9	8	F8	L	8	(	4D	U	81C
10	9	F9	L	81C	)	5D	U	82C
11	0	F0	L	82C	=	7E	U	1
12	+	4E	U	BAC	?	6F	U	A1C
13	é	79		IA	É	E0		IA
16	q	98	L	B8C	Q	D8	U	B8C
17	w	A6	L	A42	W	E6	U	A42
18	e	85	L	BA41C	E	C5	U	BA41C
19	r	99	L	B81	R	D9	U	B81
20	t	A3	L	A21	T	E3	U	A21
21	y	A8	L	A8C	Y	E8	U	A8C
22	u	A4	L	A4C	U	E4	U	A4C
23	i	89	L	BA81C	I	C9	U	BA81C
24	o	96	L	B42	O	D6	U	B42
25	p	97	L	B421C	P	D7	U	B421C
26	-	60	L	B	-	6D	U	B
27	ü	A1		IA	ü	5F	U	BA821
30	a	81	L	BA1	A	C1	U	BA1
31	s	A2	L	A2C	S	E2	U	A2C
32	d	84	L	BA4	D	C4	U	BA4
33	f	86	L	BA42C	F	C6	U	BA42C
34	g	87	L	BA421	G	C7	U	BA421
35	h	88	L	BA8	H	C8	U	BA8
36	j	91	L	B1C	J	D1	U	B1C
37	k	92	L	B2C	K	D2	U	B2C
38	l	93	L	B21	L	D3	U	B21
39	,	6B	L	A821C	,	5E	U	21C
40	.	4B	L	BA821	.	7A	U	4
41	!	7D	U	42C	!	5C	U	8
44	<	4C	U	2	>	6E	U	421
45	z	A9	L	A81	Z	E9	U	A81
46	x	A7	L	A421C	X	E7	U	A421C
47	c	83	L	BA21C	C	C3	U	BA21C
48	v	A5	L	A41	V	E5	U	A41
49	b	82	L	BA2	B	C2	U	BA2
50	n	95	L	B41	N	D5	U	B41
51	m	94	L	B4C	M	D4	U	B4C
52	å	D0	L	B821C	Å	5B	U	B821C
53	ä	C0	L	821	Ä	7B	U	821
54	ö	6A	L	A	Ö	7C	U	A
56	NU	--	-	-----	NU	--	-	-----

Figure A-27. Code Chart-FINLAND

KBD	Lowercase				Uppercase			
	GRAP	EBCDIC	S	S-SLC	GRAP	EBCDIC	S	S-SLC
1	NU	--	-	-----	NU	--	-	-----
2	1	F1	L	1	!	4F	U	A821C
3	2	F2	L	2	"	7F	U	821
4	3	F3	L	21C	§	5A	U	B821C
5	4	F4	L	4	\$	5B	L	B821C
6	5	F5	L	41C	%	6C	U	41C
7	6	F6	L	42C	+	4E	U	BAC
8	7	F7	L	421	/	61	L	A1C
9	8	F8	L	8	(	4D	U	81C
10	9	F9	L	81C	)	5D	U	82C
11	0	F0	L	82C	=	7E	U	1
12	•	7D	U	42C	?	6F	U	A1C
13	^	5F	U	BA821	..	A1		IA
16	q	98	L	B8C	Q	D8	U	B8C
17	w	A6	L	A42	W	E6	U	A42
18	e	85	L	BA41C	E	C5	U	BA41C
19	r	99	L	B81	R	D9	U	B81
20	t	A3	L	A21	T	E3	U	A21
21	y	A8	L	A8C	Y	E8	U	A8C
22	u	A4	L	A4C	U	E4	U	A4C
23	i	89	L	BA81C	I	C9	U	BA81C
24	o	96	L	B42	O	D6	U	B42
25	p	97	L	B421C	P	D7	U	B421C
26	à	7C	L	A	Ç	E0		IA
27	&	50	L	BAC	*	5C	U	8
30	a	81	L	BA1	A	C1	U	BA1
31	s	A2	L	A2C	S	E2	U	A2C
32	d	84	L	BA4	D	C4	U	BA4
33	f	86	L	BA42C	F	C6	U	BA42C
34	g	87	L	BA421	G	C7	U	BA421
35	h	88	L	BA8	H	C8	U	BA8
36	j	91	L	B1C	J	D1	U	B1C
37	k	92	L	B2C	K	D2	U	B2C
38	l	93	L	B21	L	D3	U	B21
39	é	C0		IA	è	D0		IA
40	ù	6A		IA	°	4A	U	A
41	•	79		IA	£	7B	L	821
44	<	4C	U	2	>	6E	U	421
45	z	A9	L	A81	Z	E9	U	A81
46	x	A7	L	A421C	X	E7	U	A421C
47	c	83	L	BA21C	C	C3	U	BA21C
48	v	A5	L	A41	V	E5	U	A41
49	b	82	L	BA2	B	C2	U	BA2
50	n	95	L	B41	N	D5	U	B41
51	m	94	L	B4C	M	D4	U	B4C
52	,	6B	L	A821C	;	5E	U	21C
53	.	4B	L	BA821	:	7A	U	4
54	-	60	L	B	-	6D	U	B
56	NU	--	-	-----	NU	--	-	-----

Figure A-28. Code Chart-FRANCE

KBD	Lowercase				Uppercase			
	GRAP	EBCDIC	S	S-SLC	GRAP	EBCDIC	S	S-SLC
1	NU	--	-	-----	NU	--	-	-----
2	1	F1	L	1	!	4F	U	B821C
3	2	F2	L	2	"	7F	U	821
4	3	F3	L	21C	£	7B	L	821
5	4	F4	L	4	\$	5B	L	B821C
6	5	F5	L	41C	%	6C	U	41C
7	6	F6	L	42C	&	50	L	BAC
8	7	F7	L	421	/	61	L	A1C
9	8	F8	L	8	(	4D	U	81C
10	9	F9	L	81C	)	5D	U	82C
11	0	F0	L	82C	=	7E	U	1
12	•	7D	U	42C	?	6F	U	A1C
13	†	A1	U	A821C	^	5F	U	BA821
16	q	98	L	B8C	Q	D8	U	B8C
17	w	A6	L	A42	W	E6	U	A42
18	e	85	L	BA41C	E	C5	U	BA41C
19	r	99	L	B81	R	D9	U	B81
20	t	A3	L	A21	T	E3	U	A21
21	y	A8	L	A8C	Y	E8	U	A8C
22	u	A4	L	A4C	U	E4	U	A4C
23	i	89	L	BA81C	I	C9	U	BA81C
24	o	96	L	B42	O	D6	U	B42
25	p	97	L	B421C	P	D7	U	B421C
26	è	D0		IA	é	5A	L	A
27	+	4E	U	BAC	*	5C	U	8
30	a	81	L	BA1	A	C1	U	BA1
31	s	A2	L	A2C	S	E2	U	A2C
32	d	84	L	BA4	D	C4	U	BA4
33	f	86	L	BA42C	F	C6	U	BA42C
34	g	87	L	BA421	G	C7	U	BA421
35	h	88	L	BA8	H	C8	U	BA8
36	j	91	L	B1C	J	D1	U	B1C
37	k	92	L	B2C	K	D2	U	B2C
38	l	93	L	B21	L	D3	U	B21
39	ò	6A		IA	ç	E0	U	A
40	à	C0		IA	°	4A		IA
41	ù	79		IA	§	7C		IA
44	<	4C	U	2	>	6E	U	421
45	z	A9	L	A81	Z	E9	U	A81
46	x	A7	L	A421C	X	E7	U	A421C
47	c	83	L	BA21C	C	C3	U	BA21C
48	v	A5	L	A41	V	E5	U	A41
49	b	82	L	BA2	B	C2	U	BA2
50	n	95	L	B41	N	D5	U	B41
51	m	94	L	B4C	M	D4	U	B4C
52	•	6B	L	A821C	;	5E	U	21C
53	•	4B	L	BA821	:	7A	U	4
54	-	60	L	B	-	6D	U	B
56	NU	--	-	-----	NU	--	-	-----

Figure A-29. Code Chart-ITALY

KBD	Alphameric		Alpha Symbol			KATAKANA		KANA Symbol		
	GRAP	EBCDIC	GRAP	FRN	EBCDIC	GRAP	EBCDIC	GRAP	FRN	EBCDIC
3	1	F1	!	S10	5A	ヌ	98	NU	---	---
4	2	F2	"	S12	7F	フ	9F	NU	---	---
5	3	F3	#	S23	7B	フ	81	ア	K47	47
6	4	F4	\$	S24	E0	ウ	83	ウ	K49	49
7	5	F5	%	S3	6C	エ	84	エ	K50	51
8	6	F6	&	S4	50	オ	85	オ	K51	52
9	7	F7	•	S11	7D	ヤ	A9	ヤ	K53	53
10	8	F8	(	S7	4D	ユ	AA	ユ	K54	54
11	9	F9	)	S8	5D	ヨ	AC	ヨ	K55	55
12	0	F0	£	C29	4A	ワ	BC	ヲ	K45	46
13	-	60	=	S22	7E	ホ	A3	NU	---	---
14	┘	5F	-	S39	A1	ハ	A2	NU	---	---
15	¥	5B	|	S38	4F	ヘ	58	NU	---	---
22	Q	D8	NU	----	----	タ	91	NU	---	---
23	W	E6	NU	----	----	テ	94	NU	---	---
24	E	C5	NU	----	----	イ	82	イ	K48	48
25	R	D9	NU	----	----	ス	8E	NU	---	---
26	T	E3	NU	----	----	カ	86	NU	---	---
27	Y	E8	NU	----	----	ン	BD	NU	---	---
28	U	E4	NU	----	----	ナ	96	NU	---	---
29	I	C9	NU	----	----	ニ	97	NU	---	---
30	O	D6	NU	----	----	ラ	AD	NU	---	---
31	P	D7	NU	----	----	セ	8F	NU	---	---
32	@	7C	NU	----	----	ッ	BE	NU	---	---
33	NU	---	NU	----	----	。	BF	┘	K59	42
40	A	C1	NU	----	----	チ	92	NU	---	---
41	S	E2	NU	----	----	ト	95	NU	---	---
42	D	C4	NU	----	----	シ	8D	NU	---	---
43	F	C6	NU	----	----	ハ	9D	NU	---	---
44	G	C7	NU	----	----	キ	87	NU	---	---
45	H	C8	NU	----	----	ク	88	NU	---	---
46	J	D1	NU	----	----	マ	A4	NU	---	---
47	K	D2	NU	----	----	ノ	9A	NU	---	---
48	L	D3	NU	----	----	ウ	AE	NU	---	---
49	;	5E	+	S19	4E	レ	BA	NU	---	---
50	:	7A	*	S6	5C	ケ	89	NU	---	---
51	NU	---	NU	----	----	ム	A6	┘	K60	43
58	Z	E9	NU	----	----	ツ	93	ツ	K52	56
59	X	E7	NU	----	----	サ	8C	NU	---	---
60	C	C3	NU	----	----	ソ	90	NU	---	---
61	V	E5	NU	----	----	ヒ	9E	NU	---	---
62	B	C2	NU	----	----	コ	8A	NU	---	---
63	N	D5	NU	----	----	ミ	A5	NU	---	---
64	M	D4	NU	----	----	モ	A8	NU	---	---
65	,	6B	<	S21	4C	ネ	99	,	K61	44
66	-	4B	>	S20	6E	ル	AF	。	K58	41
67	/	61	?	S9	6F	メ	A7	.	K62	45
68	NU	---	-	S17	6D	口	BB	NU	---	---

Figure A-30. Code Chart-KATAKANA

KBD	Lowercase				Uppercase			
	GRAP	EBCDIC	S	S-SLC	GRAP	EBCDIC	S	S-SLC
1	NU	--	-	-----	NU	--	-	-----
2	1	F1	L	1	ı	4F	U	A821C
3	2	F2	L	2	"	7F		IA
4	3	F3	L	21C	#	4A		IA
5	4	F4	L	4	œ	5A		IA
6	5	F5	L	41C	%	6C	U	41C
7	6	F6	L	42C	&	50	L	BAC
8	7	F7	L	421	/	61	L	A1C
9	8	F8	L	8	(	4D	U	81C
10	9	F9	L	81C	)	5D	U	82C
11	0	F0	L	82C	=	7E	U	1
12	+	4E	U	BAC	?	6F	U	A1C
13	\	E0		IA	`	79		IA
16	q	98	L	B8C	Q	D8	U	B8C
17	w	A6	L	A42	W	E6	U	A42
18	e	85	L	BA41C	E	C5	U	BA41C
19	r	99	L	B81	R	D9	U	B81
20	t	A3	L	A21	T	E3	U	A21
21	y	A8	L	A8C	Y	E8	U	A8C
22	u	A4	L	A4C	U	E4	U	A4C
23	i	89	L	BA81C	I	C9	U	BA81C
24	o	96	L	B42	O	D6	U	B42
25	p	97	L	B421C	P	D7	U	B421C
26	ø	D0	L	B821C	ø	5B	U	B821C
27	ü	A1		IA	ı	5F	U	BA821
30	a	81	L	BA1	A	C1	U	BA1
31	s	A2	L	A2C	S	E2	U	A2C
32	d	84	L	BA4	D	C4	U	BA4
33	f	86	L	BA42C	F	C6	U	BA42C
34	g	87	L	BA421	G	C7	U	BA421
35	h	88	L	BA8	H	C8	U	BA8
36	j	91	L	B1C	J	D1	U	B1C
37	k	92	L	B2C	K	D2	U	B2C
38	l	93	L	B21	L	D3	U	B21
39	ø	6A	L	A	ø	7C	U	A
40	æ	C0	L	821	æ	7B	U	821
41	•	7D	U	42C	*	5C	U	8
44	<	4C	U	2	>	6E	U	421
45	z	A9	L	A81	Z	E9	U	A81
46	x	A7	L	A421C	X	E7	U	A421C
47	c	83	L	BA21C	C	C3	U	BA21C
48	v	A5	L	A41	V	E5	U	A41
49	b	82	L	BA2	B	C2	U	BA2
50	n	95	L	B41	N	D5	U	B41
51	m	94	L	B4C	M	D4	U	B4C
52	•	6B	L	A821C	;	5E	U	21C
53	•	4B	L	BA821	:	7A	U	4
54	-	60	L	B	-	6D	U	B
56	NU	--	-	-----	NU	--	-	-----

Figure A-31. Code Chart-NORWAY

KBD	Lowercase				Uppercase			
	GRAP	EBCDIC	S	S-SLC	GRAP	EBCDIC	S	S-SLC
1	NU	--	-	-----	NU	--	-	-----
2	1	F1	L	1	!	4F	U	B821C
3	2	F2	L	2	"	7F	U	821
4	3	F3	L	21C	[	4A	U	A
5	4	F4	L	4	\$	5B	L	B821C
6	5	F5	L	41C	%	6C	U	41C
7	6	F6	L	42C	&	50	L	BAC
8	7	F7	L	421	/	61	L	A1C
9	8	F8	L	8	(	4D	U	81C
10	9	F9	L	81C	)	5D	U	82C
11	0	F0	L	82C	=	7E	U	1
12	•	7D	U	42C	?	6F	U	A1C
13	^	5F	U	BA821	]	5A	U	A821C
16	q	98	L	B8C	Q	D8	U	B8C
17	w	A6	L	A42	W	E6	U	A42
18	e	85	L	BA41C	E	C5	U	BA41C
19	r	99	L	B81	R	D9	U	B81
20	t	A3	L	A21	T	E3	U	A21
21	y	A8	L	A8C	Y	E8	U	A8C
22	u	A4	L	A4C	U	E4	U	A4C
23	i	89	L	BA81C	I	C9	U	BA81C
24	o	96	L	B42	O	D6	U	B42
25	p	97	L	B421C	P	D7	U	B421C
26	ã	C0		IA	Ã	7B	L	821
27	+	4E	U	BAC	*	5C	U	8
30	a	81	L	BA1	A	C1	U	BA1
31	s	A2	L	A2C	S	E2	U	A2C
32	d	84	L	BA4	D	C4	U	BA4
33	f	86	L	BA42C	F	C6	U	BA42C
34	g	87	L	BA421	G	C7	U	BA421
35	h	88	L	BA8	H	C8	U	BA8
36	j	91	L	B1C	J	D1	U	B1C
37	k	92	L	B2C	K	D2	U	B2C
38	l	93	L	B21	L	D3	U	B21
39	ç	A1		IA	Ç	4C	U	2
40	õ	6A		IA	Õ	7C	L	A
41	`	79		IA	¸	D0		IA
44	NU	--	-	-----	>	6E	U	421
45	z	A9	L	A81	Z	E9	U	A81
46	x	A7	L	A421C	X	E7	U	A421C
47	c	83	L	BA21C	C	C3	U	BA21C
48	v	A5	L	A41	V	E5	U	A41
49	b	82	L	BA2	B	C2	U	BA2
50	n	95	L	B41	N	D5	U	B41
51	m	94	L	B4C	M	D4	U	B4C
52	•	6B	L	A821C	;	5E	U	21C
53	•	4B	L	BA821	:	7A	U	4
54	-	60	L	B	-	6D	U	B
56	NU	--	-	-----	NU	--	-	-----

Figure A-32. Code Chart-PORTUGAL

KBD	Lowercase				Uppercase			
	GRAP	EBCDIC	S	S-SLC	GRAP	EBCDIC	S	S-SLC
1	NU	---	-	-----	NU	---	-	-----
2	1	F1	L	1	!	4F	U	A821C
3	2	F2	L	2	"	7F		IA
4	3	F3	L	21C	@	7C	L	A
5	4	F4	L	4	Ps	5B	L	B821C
6	5	F5	L	41C	%	6C	U	41C
7	6	F6	L	42C	&	50	L	BAC
8	7	F7	L	421	/	61	L	A1C
9	8	F8	L	8	(	4D	U	81C
10	9	F9	L	81C	)	5D	U	82C
11	0	F0	L	82C	=	7E	U	1
12	•	7D	U	42C	?	6F	U	A1C
13	┘	5F	U	BA821	..	A1		IA
16	q	98	L	B8C	Q	D8	U	B8C
17	w	A6	L	A42	W	E6	U	A42
18	e	85	L	BA41C	E	C5	U	BA41C
19	r	99	L	B81	R	D9	U	B81
20	t	A3	L	A21	T	E3	U	A21
21	y	A8	L	A8C	Y	E8	U	A8C
22	u	A4	L	A4C	U	E4	U	A4C
23	i	89	L	BA81C	I	C9	U	BA81C
24	o	96	L	B42	O	D6	U	B42
25	p	97	L	B421C	P	D7	U	B421C
26	\	E0	U	A	\	79	U	B821C
27	+	4E	U	BAC	*	5C	U	8
30	a	81	L	BA1	A	C1	U	BA1
31	s	A2	L	A2C	S	E2	U	A2C
32	d	84	L	BA4	D	C4	U	BA4
33	f	86	L	BA42C	F	C6	U	BA42C
34	g	87	L	BA421	G	C7	U	BA421
35	h	88	L	BA8	H	C8	U	BA8
36	j	91	L	B1C	J	D1	U	B1C
37	k	92	L	B2C	K	D2	U	B2C
38	l	93	L	B21	L	D3	U	B21
39	ñ	6A	L	821	Ñ	7B	U	821
40	{	C0		IA	[	4A		IA
41	}	D0		IA	]	5A		IA
44	<	4C	U	2	>	6E	U	421
45	z	A9	L	A81	Z	E9	U	A81
46	x	A7	L	A421C	X	E7	U	A421C
47	c	83	L	BA21C	C	C3	U	BA21C
48	v	A5	L	A41	V	E5	U	A41
49	b	82	L	BA2	B	C2	U	BA2
50	n	95	L	B41	N	D5	U	B41
51	m	94	L	B4C	M	D4	U	B4C
52	•	6B	L	A821C	;	5E	U	21C
53	•	4B	L	BA821	:	7A	U	4
54	-	60	L	B	-	6D	U	B
56	NU	---	-	-----	NU	---	-	-----

Figure A-33. Code Chart-SPAIN

KBD	Lowercase				Uppercase			
	GRAP	EBCDIC	S	S-SLC	GRAP	EBCDIC	S	S-SLC
1	NU	--	-	-----	NU	--	-	-----
2	1	F1	L	1	!	4F	U	A821C
3	2	F2	L	2	"	7F		IA
4	3	F3	L	21C	@	7C	L	A
5	4	F4	L	4	\$	5B	L	B821C
6	5	F5	L	41C	%	6C	U	41C
7	6	F6	L	42C	&	50	L	BAC
8	7	F7	L	421	/	61	L	A1C
9	8	F8	L	8	(	4D	U	81C
10	9	F9	L	81C	)	5D	U	82C
11	0	F0	L	82C	=	7E	U	1
12	•	7D	U	42C	?	6F	U	A1C
13	┌	5F	U	BA821	..	A1		IA
16	q	98	L	B8C	Q	D8	U	B8C
17	w	A6	L	A42	W	E6	U	A42
18	e	85	L	BA41C	E	C5	U	BA41C
19	r	99	L	B81	R	D9	U	B81
20	t	A3	L	A21	T	E3	U	A21
21	y	A8	L	A8C	Y	E8	U	A8C
22	u	A4	L	A4C	U	E4	U	A4C
23	i	89	L	BA81C	I	C9	U	BA81C
24	o	96	L	B42	O	D6	U	B42
25	p	97	L	B421C	P	D7	U	B421C
26	\	E0	U	A	•	79	U	B821C
27	+	4E	U	BAC	*	5C	U	8
30	a	81	L	BA1	A	C1	U	BA1
31	s	A2	L	A2C	S	E2	U	A2C
32	d	84	L	BA4	D	C4	U	BA4
33	f	86	L	BA42C	F	C6	U	BA42C
34	g	87	L	BA421	G	C7	U	BA421
35	h	88	L	BA8	H	C8	U	BA8
36	j	91	L	B1C	J	D1	U	B1C
37	k	92	L	B2C	K	D2	U	B2C
38	l	93	L	B21	L	D3	U	B21
39	ñ	6A	L	821	Ñ	7B	U	821
40	{	C0		IA	[	4A		IA
41	}	D0		IA	]	5A		IA
44	<	4C	U	2	>	6E	U	421
45	z	A9	L	A81	Z	E9	U	A81
46	x	A7	L	A421C	X	E7	U	A421C
47	c	83	L	BA21C	C	C3	U	BA21C
48	v	A5	L	A41	V	E5	U	A41
49	b	82	L	BA2	B	C2	U	BA2
50	n	95	L	B41	N	D5	U	B41
51	m	94	L	B4C	M	D4	U	B4C
52	•	6B	L	A821C	;	5E	U	21C
53	•	4B	L	BA821	:	7A	U	4
54	-	60	L	B	-	6D	U	B
56	NU	--	-	-----	NU	--	-	-----

Figure A-34. Code Chart-SPANISH-SPEAKING

KBD	Lowercase				Uppercase			
	GRAP	EBCDIC	S	S-SLC	GRAP	EBCDIC	S	S-SLC
1	NU	--	-	-----	NU	--	-	-----
2	1	F1	L	1	ı	4F	U	A821C
3	2	F2	L	2	"	7F		IA
4	3	F3	L	21C	§	4A		IA
5	4	F4	L	4	⌘	5A		IA
6	5	F5	L	41C	%	6C	U	41C
7	6	F6	L	42C	&	50	L	BAC
8	7	F7	L	421	/	61	L	A1C
9	8	F8	L	8	(	4D	U	81C
10	9	F9	L	81C	)	5D	U	82C
11	0	F0	L	82C	=	7E	U	1
12	+	4E	U	BAC	?	6F	U	A1C
13	e'	79		IA	É	E0		IA
16	q	98	L	B8C	Q	D8	U	B8C
17	w	A6	L	A42	W	E6	U	A42
18	e	85	L	BA41C	E	C5	U	BA41C
19	r	99	L	B81	R	D9	U	B81
20	t	A3	L	A21	T	E3	U	A21
21	y	A8	L	A8C	Y	E8	U	A8C
22	u	A4	L	A4C	U	E4	U	A4C
23	i	89	L	BA81C	I	C9	U	BA81C
24	o	96	L	B42	O	D6	U	B42
25	p	97	L	B421C	P	D7	U	B421C
26	ä	D0	L	B821C	Å	5B	U	B821C
27	ü	A1		IA	┘	5F	U	BA821
30	a	81	L	BA1	A	C1	U	BA1
31	s	A2	L	A2C	S	E2	U	A2C
32	d	84	L	BA4	D	C4	U	BA4
33	f	86	L	BA42C	F	C6	U	BA42C
34	q	87	L	BA421	G	C7	U	BA421
35	h	88	L	BA8	H	C8	U	BA8
36	j	91	L	B1C	J	D1	U	B1C
37	k	92	L	B2C	K	D2	U	B2C
38	l	93	L	B21	L	D3	U	B21
39	ö	6A	L	A	Ö	7C	U	A
40	ä	C0	L	821	Ä	7B	U	821
41	ı	7D	U	42C	*	5C	U	8
44	<	4C	U	2	>	6E	U	421
45	z	A9	L	A81	Z	E9	U	A81
46	x	A7	L	A421C	X	E7	U	A421C
47	c	83	L	BA21C	C	C3	U	BA21C
48	v	A5	L	A41	V	E5	U	A41
49	b	82	L	BA2	B	C2	U	BA2
50	n	95	L	B41	N	D5	U	B41
51	m	94	L	B4C	M	D4	U	B4C
52	•	6B	L	A821C	;	5E	U	21C
53	•	4B	L	BA821	:	7A	U	4
54	-	60	L	B	-	6D	U	B
56	NU	--	-	-----	NU	--	-	-----

Figure A-35. Code Chart-SWEDEN

KBD	Lowercase				Uppercase			
	GRAP	EBCDIC	S	S-SLC	GRAP	EBCDIC	S	S-SLC
1	\	E0		IA	|	6A		IA
2	1	F1	L	1	|	4F	U	A821C
3	2	F2	L	2	"	7F	U	821
4	3	F3	L	21C	£	7B	L	B821C
5	4	F4	L	4	\$	5B	U	A
6	5	F5	L	41C	%	6C	U	41C
7	6	F6	L	42C	&	50	L	BAC
8	7	F7	L	421	•	7D	U	42C
9	8	F8	L	8	(	4D	U	81C
10	9	F9	L	81C	)	5D	U	82C
11	0	F0	L	82C	NU	--	-	-----
12	-	60	L	B	=	7E	U	1
13	┌	5F	U	BA821	-	A1		IA
16	q	98	L	B8C	Q	D8	U	B8C
17	w	A6	L	A42	W	E6	U	A42
18	e	85	L	BA41C	E	C5	U	BA41C
19	r	99	L	B81	R	D9	U	B81
20	t	A3	L	A21	T	E3	U	A21
21	y	A8	L	A8C	Y	E8	U	A8C
22	u	A4	L	A4C	U	E4	U	A4C
23	i	89	L	BA81C	I	C9	U	BA81C
24	o	96	L	B42	O	D6	U	B42
25	p	97	L	B421C	P	D7	U	B421C
26	@	7C	L	A	`	79		IA
27	[	4A	L	821	{	C0		IA
30	a	81	L	BA1	A	C1	U	BA1
31	s	A2	L	A2C	S	E2	U	A2C
32	d	84	L	BA4	D	C4	U	BA4
33	f	86	L	BA42C	F	C6	U	BA42C
34	g	87	L	BA421	G	C7	U	BA421
35	h	88	L	BA8	H	C8	U	BA8
36	j	91	L	B1C	J	D1	U	B1C
37	k	92	L	B2C	K	D2	U	B2C
38	l	93	L	B21	L	D3	U	B21
39	;	5E	U	21C	+	4E	U	BAC
40	:	7A	U	4	*	5C	U	8
41	]	5A	U	B821C	}	D0		IA
44	NU	--	-	-----	-	6D	U	B
45	z	A9	L	A81	Z	E9	U	A81
46	x	A7	L	A421C	X	E7	U	A421C
47	c	83	L	BA21C	C	C3	U	BA21C
48	v	A5	L	A41	V	E5	U	A41
49	b	82	L	BA2	B	C2	U	BA2
50	n	95	L	B41	N	D5	U	B41
51	m	94	L	B4C	M	D4	U	B4C
52	•	6B	L	A821C	<	4C	U	2
53	•	4B	L	BA821	>	6E	U	421
54	/	61	L	A1C	?	6F	U	A1C
56	NU	--	-	-----	NU	--	-	-----

Figure A-36. Code Chart-UNITED KINGDOM

Appendix B. Glossary

addressing: The means whereby the originator or control station selects the unit to which it is going to send a message.

alphanumeric: Pertaining to a character set that contains letters, digits, and usually other characters such as punctuation marks; synonymous with "alphanumeric".

BASIC: An algebra-like language used for problem-solving by engineers, scientists, and others who may not be professional programmers.

bps: Bits per second. In serial transmission, the instantaneous bit speed within one character, as transmitted by a machine or a channel.

byte: The representation of a character; eight binary digits (bits), in System/360 or System/370.

communicate (online): Pertaining to equipment or devices that are under control of the central processing unit.

CPU: Central processing unit. The unit of a computer that includes the circuits controlling the interpretation and execution of instructions.

EOB: End of block. A code that marks the end of a block of data.

EOM: End of message. The specific character or sequence of characters that indicates the termination of a message or record.

half-duplex: A communications channel that is capable of transmitting in both directions, but in only one direction at a time.

integrated communication adapter (ICA): Performs the same functions as a multiplexer, but it is integrated into the CPU.

line control: The scheme of operating procedures and control signals by which a telecommunications system is controlled.

line speed: The maximum rate at which signals may be transmitted over a given channel, usually measured in baud or bits per second.

local (offline): Pertaining to equipment or devices that are not under control of the central processing unit.

modem: A device that modulates and demodulates signals transmitted over communications facilities.

multiplexer: A device for collecting the input from many communications lines and transferring it to the CPU; also, a device for receiving information from the CPU and transferring it to one of many communications lines without forcing the CPU's timing to match that of the connected terminals.

online: Associated with a processor, either directly or through a transmission control unit. The physical connection is either by multiwire cable or a communications line.

overflow: (1) That portion of the result of an operation that exceeds the capacity of the intended unit of storage. (2) A condition caused by entering a number, during offline calculation, that has more integer positions than are allowed by the current decimal point position.

private line: A communications line without interexchange switching arrangements, furnished to a customer for his exclusive use.

switched line: A telecommunications line in which the connection between the computer and a remote station is established by dialing.

telecommunications line: Telephone or other communications lines that are used to transmit messages from one location to another.

terminal: A machine or group of machines capable of generating and/or receiving signals transmitted and/or received from a communications line.

underflow: A condition caused by entering a number, during offline calculation, that has more fractional positions than are allowed by the current decimal point position.

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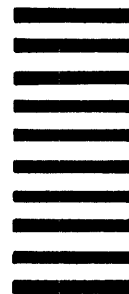
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