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МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

Information processing — Control functions for 7-bit and 8-bit coded character sets

Traitement de l'information — Fonctions de commande pour jeux de caractères codés à 7 et à 8 éléments

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Contents

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 6429 was prepared by the European Computer Manufacturers Association (as Standard ECMA-48) and was adopted, under a special "fast-track procedure", by Technical Committee ISO/TC 97, *Information processing systems*, in parallel with its approval by the ISO member bodies.

This second edition cancels and replaces the first edition (ISO 6429 : 1983), of which it constitutes a full revision.

Annexes A, B, C, D and E of this International Standard are for information only.

Information processing — Control functions for 7-bit and 8-bit coded character sets

1 Scope

1.1 This International Standard defines control functions and their coded representations for use in a 7-bit code, an extended 7-bit code, an 8-bit code or an extended 8-bit code, if such a code is structured in accordance with ISO 2022. This International Standard specifies a C0 set, a C1 set, control functions derived therefrom and a number of independent control functions.

1.2 The control functions are intended to be used embedded in character-coded data for interchange with character-imaging devices.

A character-imaging device is a device which is capable of receiving a data stream that consists of coded control functions and graphic characters, and is capable of producing character image output, i.e. output that can be read by a human being. The character image output is, in general, produced in the form of one or more rectangular arrays of character positions and lines which are called pages.

If the device is an input/output device rather than merely an output device, it is also capable of transmitting a data stream that consists of coded control functions and graphic characters; the transmitted data stream is, in general, composed of a combination of data which have been sent to the device and data which have been entered locally into the device, for example by an associated keyboard.

In general, the control functions are defined by their effects on a character-imaging input/output device. It is, therefore, necessary to make certain assumptions about the device architecture. These assumptions are as unrestrictive as possible; they are specified in clause 6.

In addition to being performed the control functions may need to be represented by a graphic symbol.

The structure of this International Standard is open-ended, so that more control functions can be included in future editions.

Other International Standards specifying control functions may define more restricted definitions of them than those in this International Standard.

1.3 The devices to which this International Standard applies can vary greatly from each other depending on the application for which a device has been specifically designed. It is technically and economically impractical for one device to implement all the facilities specified in this International Standard. The intention is that within any type of device only a limited selection of the facilities appropriate to the application will be implemented.

2 Conformance

2.1 Types of conformance

Full conformance to a standard means that all of its requirements are met. Conformance will only have a unique meaning if the standard contains no options. If there are options within the standard they must be clearly identified, and any claim of conformance must include a statement that identifies those options that have been adopted.

This International Standard is of a different nature since it specifies a large number of facilities from which different selections may be made to suit individual applications. These selections are not identified in this International Standard, but must be identified at the time that a claim of conformance is made. Conformance to such an identified selection is known as limited conformance.

2.2 Conformance of information interchange

A CC-data-element within coded information for interchange is in conformance with this International Standard if the coded representations of control functions within that CC-data-element satisfy the following conditions:

a) a coded representation of a control function that is specified in this International Standard shall always represent that control function;

b) a control function that is specified in this International Standard shall always be represented by the coded representation that is specified in this International Standard for that control function;

c) any coded representation that is reserved for future standardization by this International Standard shall not appear.

Coded representations of control functions and modes not specified in this International Standard may appear in interchanged information subject to the above conditions (see 5.5, 5.5.1 and 7.4).

2.3 Conformance of devices

A device is in conformance with this International Standard if it conforms to the requirements of 2.3.1, and either or both 2.3.2 and 2.3.3 below. Any claim of conformance shall identify the document which contains the description specified in 2.3.1.

2.3.1 Device description

A device that conforms to this International Standard shall be the subject of a description that

a) identifies, by reference to the clauses of, or to the control functions specified in, this International Standard, the selection of coded representations that the device can originate or can receive and interpret;

b) for each such control function with selective parameters, specifies the parameter values implemented;

c) if the identified selection contains a control function for which a default value for a parameter is specified in this International Standard, includes the explicit and implicit representations of this default value;

d) identifies the means by which the user may supply the corresponding control functions or may recognize them, as specified in 2.3.2 and 2.3.3, respectively.

2.3.2 Originating devices

An originating device shall be capable of transmitting within a CC-data-element the coded representations of an identified selection of control functions conforming to this International Standard.

Such a device shall allow the user to supply any control function that he chooses from among the identified selection for the purpose of transmitting its coded representation within a CC-data-element.

2.3.3 Receiving devices

A receiving device shall be capable of receiving within a CC-data-element and interpreting the coded representations of an identified selection of control functions conforming to this International Standard. It shall be able to interpret default values in both explicit and implicit representations.

Such a device shall make available to the user any control function that is within the identified selection, and the coded representation of which is received within a CC-data-element, in such a form that the user can recognize it from among the control functions of the identified selection.

3 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 1745 : 1975, *Information processing — Basic mode control procedures for data communication systems.*

ISO 2022 : 1986, *Information processing — ISO 7-bit and 8-bit coded character sets — Code extension techniques.*

ISO 2375 : 1985, *Data processing — Procedure for registration of escape sequences.*

ISO 6937 : 1983, *Information processing — Coded character sets for text communication.*

ISO 7350 : 1984, *Text communication — Registration of graphic character subrepertoires.*

ISO 8613-6 : —[1], *Information processing — Text and office systems — Office Document Architecture (ODA) and interchange format — Part 6: Character content architectures.*

ISO International Register of Coded Character Sets to be Used with Escape Sequences.

CCITT Recommendation T.61, 1984, *Character repertoire and coded character sets for the international teletex service.*

4 Notation and definitions

4.1 Notation

In this International Standard a convention has been adopted to assist the reader. Capital letters are used to refer to a specific control function, mode, mode setting, or graphic character in order to avoid confusion, for example, between the concept "space" and the character SPACE.

It is intended that this convention and the acronyms of the modes and the control functions be retained in all translations of the text. (See annex E.)

This International Standard uses the notation of the form xx/yy, where xx represents the column number 00 to 07 in a 7-bit code table or 00 to 15 in an 8-bit code table, and yy represents the row number 00 to 15.

4.2 Definitions

For the purposes of this International Standard, the following definitions apply.

4.2.1 active area: The area which contains the active position.

1) To be published.

4.2.2 active field: The field which contains the active position.

4.2.3 active line: The line which contains the active position.

4.2.4 active page: The page which contains the active position.

4.2.5 active position: The character position which is to image the graphic symbol representing the next graphic character or the next control function for which a graphic representation is required.

In general, the active position is indicated by a cursor.

4.2.6 area: A series of successive character positions that are not necessarily on the same line.

4.2.7 auxiliary device: A device connected to a character-imaging device for the purpose of inputting, storing, retrieving, or imaging data.

4.2.8 bit combination: An ordered set of bits that represents a coded character or is used as part of the representation of a coded character.

4.2.9 byte: A bit string that is operated upon as a unit.

4.2.10 to cancel: To mark data in such a way that it can be ignored in subsequent processing.

4.2.11 character: A member of a set of elements used for the organization, control or representation of data.

4.2.12 character-coded-data-element (CC-data-element): An element of interchanged information that is specified to consist of a sequence of coded representations of characters, in accordance with one or more identified standards for coded character sets.

4.2.13 character-imaging device: A device that gives a visual representation of data in the form of graphic symbols using any technology, for example cathode ray tube or printer.

4.2.14 character path: The direction of presentation of successive graphic characters along a line.

4.2.15 character position: The portion of a display that is imaging or is capable of imaging a graphic symbol.

4.2.16 to clear: To remove the display of data or the information used for the display of data, for example tabulation stops marking the boundaries between fields.

4.2.17 coded character set; code: A set of unambiguous rules that establishes a character set and the one-to-one relationship between the characters of the set and their bit combinations.

4.2.18 code extension: The techniques for the encoding of characters that are not included in the character set of a given code.

4.2.19 code table: A table showing the character allocated to each bit combination in a code.

4.2.20 control character: A control function the coded representation of which consists of a single bit combination.

4.2.21 control function: An element of a character set that effects the recording, processing, transmission, or interpretation of data, and that has a coded representation consisting of one or more bit combinations.

4.2.22 control sequence: A sequence of bit combinations starting with that representing the control character CONTROL SEQUENCE INTRODUCER (CSI), used for the coded representation of control functions with parameters.

4.2.23 control string: A delimited string of characters which may occur in the data stream as a logical entity for control purposes.

4.2.24 cursor: A special indicator used to mark the active position in a display.

4.2.25 decimal mark: A graphic symbol, usually a FULL STOP or a COMMA, used to separate the fractional part of a decimal number from the integer part of that number.

4.2.26 default: A value or a state that is to be assumed when no value or state is explicitly specified.

4.2.27 to delete: To remove the contents from character positions and closing the resulting gap by moving adjacent graphic characters into the empty positions.

4.2.28 to designate: To identify a set of characters that are to be represented, in some cases immediately and in others on the occurrence of a further control function, in a prescribed manner.

4.2.29 device: A component of information processing equipment which can transmit, and/or receive, coded information within CC-data-elements. (It may be an input/output device in the conventional sense, or a process such as an application program or gateway function.)

4.2.30 display: The region for visual presentation of data on any type of character-imaging device, including printer, cathode ray tube and similar devices.

4.2.31 editor function: Control functions used for editing, altering or transposing the visual arrangement of data.

4.2.32 eligible: The term used to denote an area considered for transmission or transfer.

4.2.33 environment: The characteristic that identifies the number of bits used to represent a character in a data processing or data communication system or in a part of such a system.

4.2.34 to erase: To remove the contents from character positions and leaving the resulting gap open.

4.2.35 escape sequence: A bit string that is used for control purposes in code extension procedures and that consists of two or more bit combinations. The first of these bit combinations represents the character ESCAPE.

4.2.36 field: An area consisting of the character position at a character tabulation stop (beginning of the field) and the character positions up to, but not including, the character position at the following character tabulation stop (end of the field).

4.2.37 Final Byte: The bit combination that terminates an escape sequence or a control sequence.

4.2.38 formator function: Control functions describing how the originator of the data stream wishes the information to be formatted or presented.

4.2.39 graphic character: A character, other than a control function, that has a visual representation normally handwritten, printed or displayed, and that has a coded representation consisting of one or more bit combinations.

4.2.40 graphic rendition: The visual style of displaying a set of graphic symbols.

4.2.41 graphic symbol: A visual representation of a graphic character or of a control function.

4.2.42 guarded area: A special case of a qualified area.

4.2.43 initial state: The state a device has after it is made operational.

It is the recommended "reset" state of the modes.

4.2.44 Intermediate Byte

a) In an Escape Sequence, a bit combination that may occur between the control function ESCAPE (ESC) and the Final Byte.

b) In a Control Sequence, a bit combination that may occur between the control function CONTROL SEQUENCE INTRODUCER (CSI) and the Final Byte, or between a Parameter Byte and the Final Byte.

4.2.45 to invoke: To cause a designated set of characters to be represented by the prescribed bit combinations whenever those bit combinations occur, until an appropriate code extension function occurs.

4.2.46 line: A set of a predetermined number of character positions.

4.2.47 line progression: The direction of presentation of successive lines.

4.2.48 operating system: The software that controls the execution of computer programs and that may provide scheduling, debugging, input/output contol, accounting, compilation, storage assignment, data management, and related services.

4.2.49 page: A set of a predetermined number of lines.

4.2.50 Parameter Byte: In a control sequence, a bit combination that may occur between the control function CONTROL SEQUENCE INTRODUCER (CSI) and the Final Byte, or between CSI and an Intermediate Byte.

4.2.51 position: The part of a code table identified by its column and row coordinates.

4.2.52 private (or experimental) use: The means of representing a non-standardized control function in a manner compatible with this International Standard.

4.2.53 protected area: A special case of a qualified area.

4.2.54 qualified area: A string of character positions to which certain characteristics are associated.

4.2.55 repertoire: The set of characters which can be represented by means of a coded representation using a coded character set.

4.2.56 scroll: The action whereby all, or part of, the graphic symbols of a display are moved in a specified direction.

4.2.57 selected area: A string of character positions, the contents of which may be eligible to be transmitted in the form of a data stream or to be transferred to an auxiliary input/output device.

4.2.58 tabulation: The technique of identifying character positions or lines in a display for the purpose of arranging information systematically.

4.2.59 tabulation stop: The indication that a character position or a line is to be used for tabulation; a character tabulation stop may also serve as a boundary between fields.

4.2.60 user: A person or other entity that invokes the services provided by a device. (This entity may be a process such as an application program if the "device" is a code convertor or a gateway function, for example.)

5 Coded representation

5.1 General

Each control function in this International Standard (except DELETE) belongs to one of the following types:

a) elements of the C0 set;

b) elements of the C1 set;

c) control sequences;

d) independent control functions;

e) control strings.

5.2 DELETE

This control function does not belong to any set. For reference purposes it is considered to be an element of the Cx set.

5.3 Elements of the C0 set

These control functions are represented in 7-bit and 8-bit codes by bit combinations from 00/00 to 01/15.

This method of representation permits coding of up to 32 control functions.

The definitions and the coded representations of the control functions are specified in 8.3 (see also table 1).

The 3-character escape sequence designating and invoking this C0 set is ESC 02/01 04/00.

NOTE — It is assumed that even with no invoked C0 set the control character ESCAPE is available and is represented by bit-combination 01/11.

Table 1 — Bit combinations representing the control functions of the C0 set

Row number	Column number	
	00	01
00	NUL	DLE
01	SOH	DC1
02	STX	DC2
03	ETX	DC3
04	EOT	DC4
05	ENQ	NAK
06	ACK	SYN
07	BEL	ETB
08	BS	CAN
09	HT	EM
10	LF	SUB
11	VT	ESC
12	FF	IS4
13	CR	IS3
14	SO or LS1	IS2
15	SI or LS0	IS1

5.4 Elements of the C1 set

These control functions are represented

a) in a 7-bit code by 2-character escape sequences of the form ESC Fe, where ESC is represented by bit combination 01/11 and Fe is represented by a bit combination from 04/00 to 05/15;

b) in an 8-bit code by bit combinations from 08/00 to 09/15; however, when the announcer sequence ESC 02/00 04/06 according to ISO 2022 is used, the control functions of the C1 set are represented by ESC Fe sequences.

The definitions and the coded representations of the control functions are specified in 8.3 (see also table 2).

The 3-character escape sequences designating and invoking this C1 set are ESC 02/06 04/00 and ESC 02/02 04/03.

Table 2 — Bit combinations representing the control functions of the C1 set

Row number	Column number		
	7-bit code	04	05
	8-bit code	08	09
00			DCS
01		—	PU1
02		BPH	PU2
03		NBH	STS
04		IND*	CCH
05		NEL	MW
06		SSA	SPA
07		ESA	EPA
08		HTS	SOS
09		HTJ	—
10		VTS	SCI
11		PLD	CSI
12		PLU	ST
13		RI	OSC
14		SS2	PM
15		SS3	APC

* See annex E.

The unallocated bit combinations are reserved for future standardization and shall not be used. They are not available for private (or experimental) use.

5.5 Control sequences

A control sequence consists of a sequence of bit combinations starting with that representing the control character CONTROL SEQUENCE INTRODUCER (CSI) followed by one or more bit combinations representing parameters, if any, and by one or more bit combinations identifying the control character. The control function CSI itself is an element of the C1 set.

The format of a control sequence is

CSI P ... P I ... I F

where

a) CSI is represented by bit combinations 01/11 (representing ESC) and 05/11 in a 7-bit code or by bit combination 09/11 in an 8-bit code, see 5.4;

b) P ... P are Parameter Bytes, which, if present, consist of bit combinations from 03/00 to 03/15;

c) I ... I are Intermediate Bytes, which, if present, consist of bit combinations from 02/00 to 02/15. Together with the Final Byte F, they identify the control function;

NOTE — The number of Intermediate Bytes is not limited by this International Standard; in practice, one Intermediate Byte will be sufficient since over one thousand control functions may be identified in this way.

d) F is the Final Byte; it consists of a bit combination from 04/00 to 07/14; it terminates the control sequence and together with the Intermediate Bytes, if present, identifies the control function. Bit combinations 07/00 to 07/14 are available as Final Bytes of control sequences for private (or experimental) use.

The definitions and the coded representations of the control functions are specified in 8.3 (see also tables 3 and 4).

Table 3 — Final Bytes of control sequences without Intermediate Bytes

Row number	Column number		
	04	05	06
00	ICH	DCH	HPA
01	CUU	SEE	HPR
02	CUD	CPR	REP
03	CUF	SU	DA
04	CUB	SD	VPA
05	CNL	NP	VPR
06	CPL	PP	HVP
07	CHA	CTC	TBC
08	CUP	ECH	SM
09	CHT	CVT	MC
10	ED	CBT	HPB
11	EL	SRS	VPB
12	IL	PTX	RM
13	DL	—	SGR
14	EF	—	DSR
15	EA	—	DAQ

The unallocated bit combinations are reserved for future standardization and shall not be used.

Table 4 — Final Bytes of control sequences with a single Intermediate Byte 02/00

Row number	Column number		
	04	05	06
00	SL	PPA	TATE
01	SR	PPR	TALE
02	GSM	PPB	TAC
03	GSS	SPD	TCC
04	FNT	DTA	TSR
05	TSS	SLH	SCO
06	JFY	SLL	SRCS
07	SPI	FNK	SCS
08	QUAD	SPQR	SLS
09	SSU	SEF	—
10	PFS	PEC	—
11	SHS	SSW	—
12	SVS	SACS	—
13	IGS	SAPV	—
14	HTSA*	STAB	—
15	IDCS	GCC	—

* See annex E.

The unallocated bit combinations are reserved for future standardization and shall not be used.

5.5.1 Parameter representation

A control sequence may contain a string of Parameter Bytes P ... P representing one or more parameters to complete the specification of the control function.

The Parameter Bytes are bit combinations from 03/00 to 03/15. The parameter string is interpreted as follows:

a) If the first bit combination of the parameter string is in the range 03/00 to 03/11, the parameter string is interpreted according to the format described in 5.5.2.

b) If the first bit combination of the parameter string is in the range 03/12 to 03/15, the parameter string is available for private (or experimental) use. Its format and meaning are not defined by this International Standard.

5.5.2 Parameter string format

A parameter string which does not start with a bit combination in the range 03/12 to 03/15 shall have the following format:

a) A parameter string consists of one or more parameter sub-strings, each of which represents a number in decimal notation.

b) Each parameter sub-string consists of one or more bit combinations from 03/00 to 03/10; the bit combinations from 03/00 to 03/09 represent the digits ZERO to NINE; bit combination 03/10 may be used as a separator in a parameter sub-string, for example, to separate the integer and decimal fraction part of a number.

c) Parameter sub-strings are separated by one bit combination 03/11.

d) Bit combinations 03/12 to 03/15 are reserved for future standardization except when used as the first bit combination of the parameter string.

e) An empty parameter sub-string represents a default value which depends on the control function, see 7.2.20.

f) In each parameter sub-string, leading bit combinations 03/00 are not significant and may be omitted. If the parameter sub-string consists of bit combinations 03/00 only, at least one of them must be retained to indicate the zero value of the sub-string, see 7.2.20.

g) If the parameter string starts with the bit combination 03/11, an empty parameter sub-string is assumed preceding the separator; if the parameter string terminates with the bit combination 03/11, an empty parameter sub-string is assumed following the separator; if the parameter string contains successive bit combinations 03/11, empty parameter sub-strings are assumed between the separators.

h) If the control function has more than one parameter, and some parameter sub-strings are empty, the separators (bit combination 03/11) must still be present. However, if the last parameter sub-string(s) is empty, the separator preceding it may be omitted, see clause B.2 of annex B.

5.5.3 Types of parameters

In a control sequence with parameters, each parameter sub-string corresponds to one parameter and represents the value

of that parameter. The number of parameters is either fixed or variable, depending on the control function. If the number of parameters is variable, neither the maximum number of values nor the order in which the corresponding actions are performed are defined by this International Standard.

A parameter may be purely numeric or it may be selective, i.e. denoting one of a numbered list of actions the control function can perform.

In the case of selected parameters a particular parameter value may have the same meaning as a combination of two or more separate values.

Unassigned selective parameter values are reserved for future standardization.

5.6 Independent control functions

These control functions are represented in 7-bit and 8-bit codes by 2-character escape sequences of the form ESC Fs, where ESC is represented by bit combination 01/11 and Fs is represented by a bit combination from 06/00 to 07/14.

The definitions and the coded representations of the control functions are specified in 8.3 (see also table 5).

Table 5 — Independent control functions

Row number	Column number	
	06	07
00	DMI	—
01	INT	—
02	EMI	—
03	RIS	—
04	CMD	—
05	—	—
06	—	—
07	—	—
08	—	—
09	—	—
10	—	—
11	—	—
12	—	LS3R
13	—	LS2R
14	LS2	LS1R
15	LS3	—

The unallocated bit combinations are reserved for future standardization and shall not be used. They are not available for private (or experimental) use.

NOTE — ESC Fs sequences are registered in the ISO International Register of Coded Character Sets to be Used with Escape Sequences, which is maintained by the Registration Authority for ISO 2375. Any candidates for ESC Fs sequences have to be approved by ISO/IEC JTC1/SC2 for registration. The coding for the Final Byte, Fs, will then be assigned by the Registration Authority.

5.7 Control strings

A control string is a delimited string of characters which may occur in the data stream as a logical entity for control purposes. A control string consists of an opening delimiter, a command string or a character string, and a terminating delimiter, the STRING TERMINATOR (ST).

A command string consists of a sequence of characters represented by bit combinations in the range 00/08 to 00/13 and 02/00 to 07/14.

A character string consists of a sequence of characters represented by any bit combination, except those representing START OF STRING (SOS) or STRING TERMINATOR (ST).

The interpretation of the command string or the character string is not defined by this International Standard, but instead requires prior agreement between the sender and the recipient of the data.

The opening delimiters defined in this International Standard are

a) APPLICATION PROGRAM COMMAND (APC)
b) DEVICE CONTROL STRING (DCS)
c) OPERATING SYSTEM COMMAND (OSC)
d) PRIVACY MESSAGE (PM)
e) START OF STRING (SOS)

6 Device concepts

The definitions of the control functions in this International Standard are based on general assumptions about the architecture of a character-imaging device. Examples of devices conforming to these concepts are: an alpha-numeric display device, a printer or a microfilm output device.

6.1 The received data stream

The received data stream is considered to be a continuous stream. It may be structured in messages, records and/or blocks, but this does not affect the operation of the device at the abstract level of description in this International Standard; the logical or physical units of data are regarded as being concatenated to form a continuous stream.

The device may contain a buffer in which the received data are temporarily stored before they are used to produce the character image output, or in which the received data are permanently stored and continuously used to produce the character image output.

6.2 The character image output

The character image output may consist of one or more pages of a predetermined size.

A page is composed of a predetermined number of lines, each composed of a predetermined number of character positions. The device may have the capability of varying the number of lines per page, the number of character positions per line, the line spacing, and the character spacing during the operation of the device.

The lines constituting a page as well as the character positions constituting a line are identified by the natural numbers 1, 2, 3...

Each character position either is in the erased state or images a graphic symbol. A graphic symbol represents SPACE, a graphic character, or a control function for which a graphical representation is required.

The initial state of all character positions is "erased".

Depending on implementation, there may or may not be a distinction between a character position in the erased state and a character position imaging SPACE.

The size of a character position may be fixed or may depend on the character being imaged.

In this International Standard, the character image output is regarded as being produced in the form of a continuous stream, but it may in actual fact be made available character-by-character, line-by-line, or page-by-page.

The lines and the character positions are numbered relative to the character image (page) output, not to the buffer (if any), according to the directions of the established line progression and the character path.

The font design of the graphic symbols is not defined by this International Standard.

6.3 The active position

At any time, there is a unique character position which is called the "active position".

The active position is the character position which is to image the graphic symbol representing the next graphic character of the received data stream or the next control function for which a graphical representation is required. The active position is also the reference position against which certain format functions or editor functions are performed (see 6.4). The line containing the active position is called the active line.

The field containing the active position is called the active field.

The page containing the active position is called the active page.

The area containing the active position is called the active area.

6.3.1 Implicit movement

If the active position is not the last character position of the active line, it is moved to the following character position of the line in the direction of the character path.

An implicit movement is performed after SPACE or a graphic character is received or a control function, for which a graphical representation is required, is executed.

6.3.2 Explicit movement

The active position is moved to a specified character position.

An explicit movement is performed when a control function is executed which causes the active position to be moved to a specified character position.

NOTES

1 It is common practice to mark the active position by means of a special indicator which is called the "cursor".

2 In the following situations, the effect of an attempt to move the active position is not defined by this International Standard:

a) an attempt to perform an implicit movement when the active position is the last character position of a line;

b) an attempt to perform an explicit movement to a non-existing character position, for example beyond the last character position of a line, or beyond the last line of a page.

Depending on implementation, an attempt to perform such an active position movement may

1) cause a wrap-around movement;

2) cause the active position to be blocked (a condition in which no graphic character can be entered until a valid explicit active position movement is performed);

3) cause the active position to remain where it is but permit graphic characters to be entered thereby replacing or overstriking the previously entered character;

4) cause the cursor to disappear from the operator's view;

5) cause the cursor to move to the opposite end of the display but one row or column offset;

6) cause scrolling to occur;

7) cause other implementation-dependent action.

6.4 Formator functions and editor functions

Two classes of control functions have an action on the layout or positioning of information in character-imaging devices. They are formator functions and editor functions. The principal difference between editor functions and formator functions is that the latter are sensitive to the FORMAT EFFECTOR ACTION MODE (FEAM); whereas the former are not (see annex A).

6.4.1 Formator functions

They are format effectors and presentation control functions. Formator functions may be part of the data stream. They describe how the originator of the data stream wishes the information to be formatted or presented.

Therefore, if formator functions are not stored by the receiving device they shall be regenerated by the device for subsequent transmission to additional recipients in order to preserve data integrity.

Formator functions are processed depending on the setting of the FORMAT EFFECTOR ACTION MODE (FEAM) of the device.

6.4.2 Composite graphic characters

Composite graphic characters may be obtained by using formator functions only; editor functions shall not be used for this purpose (see clause A.3 of annex A).

6.4.3 Editor functions

The main purpose of editor functions is to edit, alter or transpose the visual arrangement of data.

Editor functions are performed immediately and do not become part of the data stream.

The active position (or the active line, where applicable) is the reference position against which all editing operations are performed.

6.5 Selected and qualified areas

This sub-clause is applicable primarily to buffered input/output devices. It may also be applicable to unbuffered input/output devices when the SEND/RECEIVE MODE (SRM) is set to SIMULTANEOUS.

6.5.1 Selected areas

A selected area is a string of character positions, the contents of which may be eligible (see 7.3.1) to be transmitted in the form of a data stream or to be transferrred to an auxiliary input/output device (see 6.6).

The beginning of a selected area is established by START OF SELECTED AREA (SSA). The character position which is the active position after the receipt of SSA is the first character position of the selected area.

The end of a selected area is established by END OF SELECTED AREA (ESA). The character position which is the active position before the receipt of ESA is the last character position of the selected area.

6.5.2 Qualified areas

A qualified area is a string of character positions with which certain characteristics are associated, such as one or a combination of the following:

a) the contents are protected against manual alteration;

b) the kind of characters which are permitted to be entered is restricted (for example, to numeric or alphabetic characters only);

c) the contents are protected against erasure;

d) a tabulation stop is associated with the first character position;

e) the contents are to be excluded, i.e. guarded (see 6.5.2.2) from transmission as a data stream, or from transfer to an auxiliary input/output device (see 6.6).

The beginning of a qualified area is established by DEFINE AREA QUALIFICATION (DAQ). The character position which is the active position after receipt of DAQ is the first character position of the qualified area. The type of area qualification is specified by the parameter of DAQ. The end of a qualified area is established by the beginning of the following qualified area.

6.5.2.1 Protected areas

A protected area is a special case of a qualified area. It is a string of character positions, the contents of which are protected against manual alteration and may also be protected against erasure depending on the setting of the ERASURE MODE (ERM). A protected area may, in general, be either guarded or unguarded.

6.5.2.2 Guarded areas

A guarded area is a special case of a qualified area. It is a protected area the contents of which are excluded from transmission as a data stream and from transfer to an auxiliary input/output device, depending on the setting of the GUARDED AREA TRANSFER MODE (GATM).

Alternatively to using DEFINE AREA QUALIFICATION (DAQ) the start of a guarded area may also be established by START OF GUARDED AREA (SPA). The character position which is the active position after receipt of SPA is the first character position of the guarded area.

Also, alternatively to using DAQ the end of a guarded area may be established by END OF GUARDED AREA (EPA). The character position which is the active position before the receipt of EPA is the last character position of the guarded area.

NOTE — Interaction between guarded areas established by SPA and EPA, and those established by DAQ is not defined by this International Standard.

6.6 Auxiliary input/output devices

This sub-clause is applicable primarily to buffered input/output devices. It may also be applicable to unbuffered input/output devices when the SEND/RECEIVE MODE (SRM) is set to SIMULTANEOUS.

Data transfer from, or to, an auxiliary input/output device is initiated either by the operation of an appropriate key on a keyboard or by the control function MEDIA COPY (MC) appearing in the received data stream.

If there is more than one auxiliary input/output device, the relevant device is specified by the parameter of MC.

An input data stream which is received from an auxiliary device is processed in the same way as any other received data stream. The method of terminating the input from the auxiliary device depends on the implementation.

7 Modes

7.1 The concept of modes

This International Standard is intended to be applicable to a very large range of devices, in which there are variations. Some of these variations have been formalized in the form of modes. They deal with the way in which a device transmits, receives, processes, or images data. Each mode has two states. The reset state is shown first in the definitions in 7.2.

The states of the modes may be established explicitly in the data stream by the control functions SET MODE (SM) and RESET MODE (RM) or may be established by agreement between sender and recipient. In an implementation, some or all of the modes may have one state only.

To ensure data compatibility and ease of interchange with a variety of equipment the use of modes is deprecated. If modes have to be implemented for backward compatibility it is recommended that the reset state of the modes be the initial state. Otherwise, explicit agreements will have to be negotiated between sender and recipient, to the detriment of "blind" interchange.

7.2 Definition of modes

The modes are set and reset by the control functions SET MODE (SM) and RESET MODE (RM). The parameter of SM or RM specifies the mode which is affected. In each of the mode definitions below, the first state is caused by RM, the second one by SM.

The modes are listed in the alphabetical order of their acronyms. It is intended that the acronyms be retained in all translations of the text.(See annex E.)

7.2.1 CRM — CONTROL REPRESENTATION MODE

CONTROL:

All control functions are performed as defined; the way formator functions are processed depends on the setting of the FORMAT EFFECTOR ACTION MODE (FEAM). A device may choose to image the graphical representations of control functions in addition to performing them.

GRAPHIC:

All control functions, except RESET MODE (RM), are treated as graphic characters. A device may choose to perform some control functions in addition to storing them and imaging their graphical representations.

NOTE — All control functions, except RM, are affected.

7.2.2 EBM — EDITING BOUNDARY MODE (see annex E)

Because a relevant parameter was added to SELECT EDITING EXTENT (SEE) this mode is no longer required and should no longer be used.

7.2.3 ERM — ERASURE MODE

PROTECT:

Only the contents of unprotected areas are affected by an erasure control function.

ALL:

The contents of protected as well as of unprotected areas are affected by an erasure control function.

NOTE — Control functions affected are: EA, ECH, ED, EF, EL.

7.2.4 FEAM — FORMAT EFFECTOR ACTION MODE

EXECUTE:

Formator functions are performed immediately and may be stored in addition to being performed.

STORE:

Formator functions are stored but not performed. In this case, the specified action is intended to be performed by another device when the associated data are transmitted or transferred.

NOTE — Control functions affected are: BPH, BS, CR, DTA, FF, FNT, GCC, GSM, GSS, HPA, HPB, HPR, HT, HTJ, HTS, HTSA*, HVP, IND*, JFY, NEL, PEC, PFS, PLD, PLU, PPA, PPB, PPR, PTX, QUAD, RI, SACS, SAPV, SCO, SCS, SGR, SHS, SLH, SLL, SLS, SPD, SPI, SPQR, SRCS, SRS, SSU, SSW, STAB, SVS, TAC, TALE, TATE, TBC, TCC, TSS, VPA, VPB, VPR, VTS.

* See annex E.

7.2.5 FETM — FORMAT EFFECTOR TRANSFER MODE

INSERT:

Formator functions may be inserted in a data stream to be transmitted or in data to be transferred to an auxiliary input/output device.

EXCLUDE:

No formator functions other than those received while the FORMAT EFFECTOR ACTION MODE (FEAM) is set to STORE are included in a transmitted data stream or in data transferred to an auxiliary input/output device.

NOTE — No control functions are affected.

7.2.6 GATM — GUARDED AREA TRANSFER MODE

GUARD:

Only the contents of unguarded areas in an eligible area are transmitted or transferred.

ALL:

The contents of guarded as well as of unguarded areas in an eligible area are transmitted or transferred.

NOTE — No control functions are affected.

Table 6 — Mode summary

Acronym	Reset-state set-state	Name	Defined in
CRM	CONTROL GRAPHIC	CONTROL REPRESENTATION MODE	7.2.1
EBM	DISPLAY ALL	EDITING BOUNDARY MODE	clause E.2 of annex E
ERM	PROTECT ALL	ERASURE MODE	7.2.3
FEAM	EXECUTE STORE	FORMAT EFFECTOR ACTION MODE	7.2.4
FETM	INSERT EXCLUDE	FORMAT EFFECTOR TRANSFER MODE	7.2.5
GATM	GUARD ALL	GUARDED AREA TRANSFER MODE	7.2.6
GRCM	REPLACING CUMULATIVE	GRAPHIC RENDITION COMBINATION MODE	7.2.7
HEM	FOLLOWING PRECEDING	CHARACTER EDITING MODE	7.2.8
IRM	REPLACE INSERT	INSERTION REPLACEMENT MODE	7.2.9
KAM	ENABLED DISABLED	KEYBOARD ACTION MODE	7.2.10
LF/NLM	LINE FEED NEW LINE	LINE FEED/NEW LINE MODE	clause E.2 of annex E
MATM	SINGLE MULTIPLE	MULTIPLE AREA TRANSFER MODE	7.2.12
PUM	CHARACTER SIZE	POSITIONING UNIT MODE	7.2.13
SATM	SELECT ALL	SELECTED AREA TRANSFER MODE	7.2.14
SRM	MONITOR SIMULTANEOUS	SEND/RECEIVER MODE	7.2.15
SRTM	NORMAL DIAGNOSTIC	STATUS REPORT TRANSFER MODE	7.2.16
TSM	MULTIPLE SINGLE	TABULATION STOP MODE	7.2.17
TTM	CURSOR ALL	TRANSFER TERMINATION MODE	7.2.18
VEM	FOLLOWING PRECEDING	LINE EDITING MODE	7.2.19
ZDM	ZERO DEFAULT	ZERO DEFAULT MODE	7.2.20

7.2.7 GRCM — GRAPHIC RENDITION COMBINATION MODE

REPLACING:

Each occurrence of the control function SELECT GRAPHIC RENDITION (SGR) cancels the effect of any preceding occurrence. Any graphic rendition aspects that are to remain unchanged after an occurrence of SGR have to be re-specified by that SGR.

CUMULATIVE:

Each occurrence of the control function SELECT GRAPHIC RENDITION (SGR) causes only those graphic rendition aspects to be changed that are specified by that SGR. All other graphic rendition aspects remain unchanged.

NOTE — Control function affected is: SGR.

7.2.8 HEM — CHARACTER EDITING MODE

FOLLOWING:

A character insertion causes the contents of the active position and of the following character positions to be shifted in the direction of the character path; a character deletion causes the contents of character positions following the active position to be shifted in the direction opposite to that of the character path.

PRECEDING:

A character insertion causes the contents of the active position and of preceding character positions to be shifted in the direction opposite to that of the character path; a character deletion causes the contents of character positions preceding the active position to be shifted in the direction of the character path.

NOTE — Control functions affected are: DCH, ICH.

7.2.9 IRM — INSERTION REPLACEMENT MODE

REPLACE:

The graphic symbol of a graphic character or of a control function, for which a graphical representation is required, replaces (or, depending upon the implementation, is combined with) the graphic symbol imaged at the active position.

INSERT:

The graphic symbol of a graphic character or of a control function, for which a graphical representation is required, is inserted at the active position.

NOTE — Only control functions for which a graphical representation is required are affected.

7.2.10 KAM — KEYBOARD ACTION MODE

ENABLED:

All or part of the manual input facilities are enabled to be used.

DISABLED:

All or part of the manual input facilities are disabled.

NOTE — No control functions are affected.

7.2.11 LF/NLM — LINE FEED/NEW LINE MODE

See annex E.

7.2.12 MATM — MULTIPLE AREA TRANSFER MODE

SINGLE:

Only the contents of the selected area which contains the active position are eligible to be transmitted or transferred.

MULTIPLE:

The contents of all selected areas are eligible to be transmitted or transferred.

NOTE — No control functions are affected.

7.2.13 PUM — POSITIONING UNIT MODE

CHARACTER:

The unit for numeric parameters of the positioning format effectors is one character position.

SIZE:

The unit for numeric parameters of the positioning format effectors is that established by SELECT SIZE UNIT (SSU).

NOTE — Control functions affected are: CUB, CUD, CUF, CUU, HPA, HPB, HPR, HTSA*, HVP, SLH, SLL, SSU, VPA, VPB, VPR.

* See annex E.

7.2.14 SATM — SELECTED AREA TRANSFER MODE

SELECT:

Only the contents of selected areas are eligible to be transmitted or transferred.

ALL:

The contents of all character positions, irrespective of any explicitly defined selected areas, are eligible to be transmitted or transferred.

NOTE — No control functions are affected.

7.2.15 SRM — SEND/RECEIVE MODE

MONITOR:

Data which are locally entered are immediately imaged.

SIMULTANEOUS:

Local input facilities are logically disconnected from the output mechanism; only data which are sent to the device are imaged.

NOTE — No control functions are affected.

7.2.16 SRTM — STATUS REPORT TRANSFER MODE

NORMAL:

Status reports in the form of DEVICE CONTROL STRINGs (DCS) are not generated automatically.

DIAGNOSTIC:

Status reports in the form of DEVICE CONTROL STRINGs (DCS) are included in every data stream transmitted or transferred.

NOTE — No control functions are affected.

7.2.17 TSM — TABULATION STOP MODE

MULTIPLE:

Character tabulation stops are set or cleared in the active line and in the corresponding character positions of the preceding lines and of the following lines.

SINGLE:

Character tabulation stops are set or cleared in the active line only.

NOTE — Control functions affected are: CTC, DL, HTS, HTSA*, IL, TBC.

* See annex E.

7.2.18 TTM — TRANSFER TERMINATION MODE

CURSOR:

Only the contents of the character positions preceding the active position are eligible to be transmitted or transferred.

ALL:

The contents of character positions preceding, following, and at the active position are eligible to be transmitted or transferred.

NOTE — No control functions are affected.

7.2.19 VEM — LINE EDITING MODE

FOLLOWING:

A line insertion causes the contents of the active line and of following lines to be shifted in the direction of the line progression; a line deletion causes the contents of the lines following the active line to be shifted in the direction opposite to that of the line progression.

PRECEDING:

A line insertion causes the contents of the active line and of preceding lines to be shifted in the direction opposite to that of the line progression; a line deletion causes the contents of the lines preceding the active line to be shifted in the direction of the line progression.

NOTE — Control functions affected are: DL, IL.

7.2.20 ZDM — ZERO DEFAULT MODE

ZERO:

A parameter value of zero of a control function means the number zero.

DEFAULT:

A parameter value of zero represents a default parameter value which may be different from zero.

NOTE — This mode is provided for implementations of the previous edition of this International Standard which specified that "an empty parameter sub-string or a parameter sub-string which consists of bit combinations 03/00 only represents a default value which depends on the control function".

For numeric parameters which are expressed in units established by SELECT SIZE UNIT (SSU), zero is now a specifiable value. For numeric parameters which are effectively repeat counts, a zero parameter value now corresponds to a 'no-op'. In either instance, non-negative computed numeric parameter values may be used without treating zero as a special (unusable) case.

Where an explicit parameter value is not used, implementors are urged to omit a parameter value (use an empty parameter sub-string) to imply a default parameter value.

Control functions affected are: CBT, CHA, CHT, CNL, CPL, CPR, CUB, CUD, CUF, CUP, CUU, CVT, DCH, DL, ECH, GSM, HPA, HPB, HPR, HVP, ICH, IL, NP, PP, PPA, PPB, PPR, REP, SD, SL, SR, SU, TCC, VPA, VPB, VPR.

7.3 Interaction between modes

Three groups of modes are specified below. Each group contains two or more modes which interact with one another.

a) GUARDED AREA TRANSFER MODE (GATM), MULTIPLE AREA TRANSFER MODE (MATM), SELECTED AREA TRANSFER MODE (SATM), and TRANSFER TERMINATION MODE (TTM)

b) CONTROL REPRESENTATION MODE (CRM), and FORMAT EFFECTOR ACTION MODE (FEAM)

c) CHARACTER EDITING MODE (HEM), and INSERTION REPLACEMENT MODE (IRM)

7.3.1 GUARDED AREA TRANSFER MODE (GATM), MULTIPLE AREA TRANSFER MODE (MATM), SELECTED AREA TRANSFER MODE (SATM), and TRANSFER TERMINATION MODE (TTM)

These modes have a combined effect on the format of a transmitted data stream or of a data stream transferred to an auxiliary input/output device, as described hereafter.

The term "active selected area" is used to denote the selected area containing the active position. The term "eligible" is used to denote any area which may be considered for transmitting or transferring.

a) If the TTM is set to CURSOR, the SATM to SELECT, and the MATM to SINGLE, then the contents of the active selected area, up to but excluding the active position, are eligible.

b) If the TTM is set to CURSOR, the SATM to SELECT, and the MATM to MULTIPLE, then the contents of any selected area, up to but excluding the active position, are eligible.

c) If the TTM is set to CURSOR and the SATM to ALL, then the contents of the buffer up to but excluding the active position, are eligible.

d) If the TTM is set to ALL, the SATM to SELECT, and the MATM to SINGLE, then the complete contents of the active selected area are eligible.

e) If the TTM is set to ALL, the SATM to SELECT, and the MATM to MULTIPLE, then the complete contents of all selected areas are eligible.

f) If the TTM and the SATM are both set to ALL, then the complete contents of the buffer are eligible.

g) If the GATM is set to GUARD, the contents of the eligible area or areas are transmitted or transferred, except for the contents of guarded areas which are completely contained within an eligible area. In the case where a guarded area is only partly contained within an eligible area, the contents of the part contained in the eligible area may be transmitted or not, depending on the implementation.

h) If the GATM is set to ALL, guarded as well as unguarded data in an eligible area are transmitted or transferred.

If the active position is not within a selected area, the format of the data stream in the first and fourth case above is not defined by this International Standard.

7.3.2 CONTROL REPRESENTATION MODE (CRM) and FORMAT EFFECTOR ACTION MODE (FEAM)

a) If the CRM is set to CONTROL, and the FEAM is set to EXECUTE, all control functions are performed as defined.

b) If the CRM is set to CONTROL, and the FEAM is set to STORE, format functions are treated as graphic characters.

c) If the CRM is set to GRAPHIC, all control functions except RM are treated as graphic characters.

7.3.3 CHARACTER EDITING MODE (HEM) and INSERTION REPLACEMENT MODE (IRM)

a) If the IRM is set to REPLACE, the HEM influences the control functions DELETE CHARACTER (DCH) and INSERT CHARACTER (ICH) only.

b) If the IRM is set to INSERT, then, in addition, the effect of the receipt of a graphic character or a control function for which a graphical representation is required depends on the setting of the HEM. If the latter is set to FOLLOWING, the implicit movement of the active position is performed normally; if it is set to PRECEDING, the active position does not move.

7.4 Private modes

A device may implement modes other than those specified in 7.2. Such modes are called Private Modes. See SET MODE (SM) and RESET MODE (RM), and 5.5.1.

The reset state of a private mode shall permit the selection of coded representations of control functions (including parameters for control of modes) that are identified in accordance with 2.3.1 to have the meanings specified in this International Standard.

8 Control functions

8.1 Types of control functions

There are different types of control functions. They are indicated by the following notations:

a)	(Cx)	:	Not an element of any set
b)	(C0)	:	Element of the C0 set
c)	(C1)	:	Element of the C1 set
d)	(Pn)	:	Control sequence with a single numeric parameter
e)	(Pn1;Pn2)	:	Control sequence with two numeric parameters
f)	(Pn...)	:	Control sequence with any number of numeric parameters
g)	(Ps)	:	Control sequence with a single selective parameter
h)	(Ps1;Ps2)	:	Control sequence with two selective parameters
i)	(Ps...)	:	Control sequence with any number of selective parameters
k)	(Fs)	:	Independent control function, represented by an ESC Fs sequence

8.2 Categories of control functions

The following list groups the control functions defined in this International Standard. This grouping is intended to aid in understanding the International Standard and does not restrict the use of the control functions to the indicated categories.

8.2.1 Delimiters

Acronym	Notation	Name	Defined in
APC	(C1)	APPLICATION PROGRAM COMMAND	8.3.2
CMD	(Fs)	CODING METHOD DELIMITER	8.3.11
DCS	(C1)	DEVICE CONTROL STRING	8.3.27
OSC	(C1)	OPERATING SYSTEM COMMAND	8.3.90
PM	(C1)	PRIVACY MESSAGE	8.3.95
SOS	(C1)	START OF STRING	8.3.126
ST	(C1)	STRING TERMINATOR	8.3.139

8.2.2 Introducers

Acronym	Notation	Name	Defined in
CSI	(C1)	CONTROL SEQUENCE INTRODUCER	8.3.16
ESC	(C0)	ESCAPE	8.3.49
SCI	(C1)	SINGLE CHARACTER INTRODUCER	8.3.110

8.2.3 Shift functions

Acronym	Notation	Name	Defined in
LS0	(C0)	LOCKING-SHIFT ZERO	8.3.76
LS1	(C0)	LOCKING-SHIFT ONE	8.3.77
LS1R	(Fs)	LOCKING-SHIFT ONE RIGHT	8.3.78
LS2	(Fs)	LOCKING-SHIFT TWO	8.3.79
LS2R	(Fs)	LOCKING-SHIFT TWO RIGHT	8.3.80
LS3	(Fs)	LOCKING-SHIFT THREE	8.3.81
LS3R	(Fs)	LOCKING-SHIFT THREE RIGHT	8.3.82
SI	(C0)	SHIFT-IN	8.3.118
SO	(C0)	SHIFT-OUT	8.3.124
SS2	(C1)	SINGLE-SHIFT TWO	8.3.137
SS3	(C1)	SINGLE-SHIFT THREE	8.3.138

8.2.4 Format effectors

Acronym	Notation	Name	Defined in
BS	(C0)	BACKSPACE	8.3.5
CR	(C0)	CARRIAGE RETURN	8.3.15
FF	(C0)	FORM FEED	8.3.52

HPA	(Pn)	CHARACTER POSITION ABSOLUTE	8.3.58
HPB	(Pn)	CHARACTER POSITION BACKWARD	8.3.59
HPR	(Pn)	CHARACTER POSITION FORWARD	8.3.60
HT	(C0)	CHARACTER TABULATION	8.3.61
HTJ	(C1)	CHARACTER TABULATION WITH JUSTIFICATION	8.3.62
HTS	(C1)	CHARACTER TABULATION SET	8.3.63
HTSA	(Pn...)	CHARACTER TABULATION SET ABSOLUTE	clause E.3 of annex E
HVP	(Pn1;Pn2)	CHARACTER AND LINE POSITION	8.3.64
IND	(C1)	INDEX	clause E.3 of annex E
LF	(C0)	LINE FEED	8.3.75
NEL	(C1)	NEXT LINE	8.3.87
PLD	(C1)	PARTIAL LINE FORWARD	8.3.93
PLU	(C1)	PARTIAL LINE BACKWARD	8.3.94
PPA	(Pn)	PAGE POSITION ABSOLUTE	8.3.97
PPB	(Pn)	PAGE POSITION BACKWARD	8.3.98
PPR	(Pn)	PAGE POSITION FORWARD	8.3.99
RI	(C1)	REVERSE LINE FEED	8.3.105
TBC	(Ps)	TABULATION CLEAR	8.3.150
TSR	(Pn)	TABULATION STOP REMOVE	8.3.152
VPA	(Pn)	LINE POSITION ABSOLUTE	8.3.154
VPB	(Pn)	LINE POSITION BACKWARD	8.3.155
VPR	(Pn)	LINE POSITION FORWARD	8.3.156
VT	(C0)	LINE TABULATION	8.3.157
VTS	(C1)	LINE TABULATION SET	8.3.158

8.2.5 Presentation control functions

Acronym	Notation	Name	Defined in
BPH	(C1)	BREAK PERMITTED HERE	8.3.4
DTA	(Pn1;Pn2)	DIMENSION TEXT AREA	8.3.37
FNT	(Ps1;Ps2)	FONT SELECTION	8.3.54
GCC	(Ps)	GRAPHIC CHARACTER COMPOSITION	8.3.55
GSM	(Pn1;Pn2)	GRAPHIC SIZE MODIFICATION	8.3.56
GSS	(Pn)	GRAPHIC SIZE SELECTION	8.3.57

JFY	(Ps...)	JUSTIFY	8.3.74
NBH	(C1)	NO BREAK HERE	8.3.86
PEC	(Ps)	PRESENTATION EXPAND OR CONTRACT	8.3.91
PFS	(Ps)	PAGE FORMAT SELECTION	8.3.92
PTX	(Ps)	PARALLEL TEXTS	8.3.100
QUAD	(Ps...)	QUAD	8.3.103
SACS	(Pn)	SET ADDITIONAL CHARACTER SEPARATION	8.3.108
SAPV	(Ps...)	SELECT ALTERNATIVE PRESENTATION VARIANTS	8.3.109
SCO	(Ps)	SET CHARACTER ORIENTATION	8.3.111
SCS	(Pn)	SET CHARACTER SPACING	8.3.112
SGR	(Ps...)	SELECT GRAPHIC RENDITION	8.3.116
SHS	(Ps)	SELECT CHARACTER SPACING	8.3.117
SLH	(Pn)	SET LINE HOME	8.3.120
SLL	(Pn)	SET LINE LIMIT	8.3.121
SLS	(Pn)	SET LINE SPACING	8.3.122
SPD	(Ps)	SELECT PRESENTATION DIRECTIONS	8.3.128
SPI	(Pn1;Pn2)	SPACING INCREMENT	8.3.129
SPQR	(Ps)	SELECT PRINT QUALITY AND RAPIDITY	8.3.130
SRCS	(Pn)	SET REDUCED CHARACTER SEPARATION	8.3.132
SRS	(Ps)	START REVERSED STRING	8.3.133
SSU	(Ps)	SELECT SIZE UNIT	8.3.135
SSW	(Pn)	SELECT SPACE WIDTH	8.3.136
STAB	(Ps)	SELECTIVE TABULATION	8.3.140
SVS	(Ps)	SELECT LINE SPACING	8.3.145
TAC	(Pn)	TABULATION ALIGNED CENTRED	8.3.147
TALE	(Pn)	TABULATION ALIGNED LEADING EDGE	8.3.148
TATE	(Pn)	TABULATION ALIGNED TRAILING EDGE	8.3.149
TCC	(Pn1;Pn2)	TABULATION CENTRED ON CHARACTER	8.3.151
TSS	(Pn)	THIN SPACE SPECIFICATION	8.3.153

8.2.6 Editor functions

Acronym	Notation	Name	Defined in
DCH	(Pn)	DELETE CHARACTER	8.3.26
DL	(Pn)	DELETE LINE	8.3.33

EA	(Ps)	ERASE IN AREA	8.3.38
ECH	(Pn)	ERASE CHARACTER	8.3.39
ED	(Ps)	ERASE IN PAGE	8.3.40
EF	(Ps)	ERASE IN FIELD	8.3.41
EL	(Ps)	ERASE IN LINE	8.3.42
ICH	(Pn)	INSERT CHARACTER	8.3.65
IL	(Pn)	INSERT LINE	8.3.68

8.2.7 Cursor control functions

Acronym	Notation	Name	Defined in
CBT	(Pn)	CURSOR BACKWARD TABULATION	8.3.7
CHA	(Pn)	CURSOR CHARACTER ABSOLUTE	8.3.9
CHT	(Pn)	CURSOR FORWARD TABULATION	8.3.10
CNL	(Pn)	CURSOR NEXT LINE	8.3.12
CPL	(Pn)	CURSOR PRECEDING LINE	8.3.13
CTC	(Ps...)	CURSOR TABULATION CONTROL	8.3.17
CUB	(Pn)	CURSOR LEFT	8.3.18
CUD	(Pn)	CURSOR DOWN	8.3.19
CUF	(Pn)	CURSOR RIGHT	8.3.20
CUP	(Pn1;Pn2)	CURSOR POSITION	8.3.21
CUU	(Pn)	CURSOR UP	8.3.22
CVT	(Pn)	CURSOR LINE TABULATION	8.3.23

8.2.8 Display control functions

Acronym	Notation	Name	Defined in
NP	(Pn)	NEXT PAGE	8.3.88
PP	(Pn)	PRECEDING PAGE	8.3.96
SD	(Pn)	SCROLL DOWN	8.3.113
SL	(Pn)	SCROLL LEFT	8.3.119
SR	(Pn)	SCROLL RIGHT	8.3.131
SU	(Pn)	SCROLL UP	8.3.143

8.2.9 Device control functions

Acronym	Notation	Name	Defined in
DC1	(C0)	DEVICE CONTROL ONE	8.3.28

DC2	(C0)	DEVICE CONTROL TWO	8.3.29
DC3	(C0)	DEVICE CONTROL THREE	8.3.30
DC4	(C0)	DEVICE CONTROL FOUR	8.3.31

8.2.10 Information separators

Acronym	Notation	Name	Defined in
IS1	(C0)	INFORMATION SEPARATOR ONE	8.3.70
IS2	(C0)	INFORMATION SEPARATOR TWO	8.3.71
IS3	(C0)	INFORMATION SEPARATOR THREE	8.3.72
IS4	(C0)	INFORMATION SEPARATOR FOUR	8.3.73

NOTE — Each information separator is given two names. The names, INFORMATION SEPARATOR FOUR (IS4), INFORMATION SEPARATOR THREE (IS3), INFORMATION SEPARATOR TWO (IS2), and INFORMATION SEPARATOR ONE (IS1) are the general names. The names FILE SEPARATOR (FS), GROUP SEPARATOR (GS), RECORD SEPARATOR (RS), and UNIT SEPARATOR (US) are the specific names and are intended mainly for applications where the information separators are used hierarchically. The ascending order is then US, RS, GS, FS. In this case, data normally delimited by a particular separator cannot be split by a higher-order separator but will be considered as delimited by any other higher-order separator.

In ISO 6937-3, IS3 and IS4 are given the names PAGE TERMINATOR (PT) and DOCUMENT TERMINATOR (DT), respectively and may be used to reset presentation attributes to the default state.

8.2.11 Area definition

Acronym	Notation	Name	Defined in
DAQ	(Ps...)	DEFINE AREA QUALIFICATION	8.3.25
EPA	(C1)	END OF GUARDED AREA	8.3.47
ESA	(C1)	END OF SELECTED AREA	8.3.48
SPA	(C1)	START OF GUARDED AREA	8.3.127
SSA	(C1)	START OF SELECTED AREA	8.3.134

8.2.12 Mode setting

Acronym	Notation	Name	Defined in
RM	(Ps...)	RESET MODE	8.3.107
SM	(Ps...)	SET MODE	8.3.123

8.2.13 Transmission control functions

Acronym	Notation	Name	Defined in
ACK	(C0)	ACKNOWLEDGE	8.3.1
DLE	(C0)	DATA LINK ESCAPE	8.3.34
ENQ	(C0)	ENQUIRY	8.3.45
EOT	(C0)	END OF TRANSMISSION	8.3.46
ETB	(C0)	END OF TRANSMISSION BLOCK	8.3.50
ETX	(C0)	END OF TEXT	8.3.51

NAK	(C0)	NEGATIVE ACKNOWLEDGE	8.3.85
SOH	(C0)	START OF HEADING	8.3.125
STX	(C0)	START OF TEXT	8.3.142
SYN	(C0)	SYNCHRONOUS IDLE	8.3.146

8.2.14 Miscellaneous control functions

Acronym	Notation	Name	Defined in
BEL	(C0)	BELL	8.3.3
CAN	(C0)	CANCEL	8.3.6
CCH	(C1)	CANCEL CHARACTER	8.3.8
CPR	(Pn1;Pn2)	ACTIVE POSITION REPORT	8.3.14
DA	(Ps)	DEVICE ATTRIBUTES	8.3.24
DEL	(Cx)	DELETE	8.3.32
DMI	(Fs)	DISABLE MANUAL INPUT	8.3.35
DSR	(Ps)	DEVICE STATUS REPORT	8.3.36
EM	(C0)	END OF MEDIUM	8.3.43
EMI	(Fs)	ENABLE MANUAL INPUT	8.3.44
FNK	(Pn)	FUNCTION KEY	8.3.53
IDCS	(Ps)	IDENTIFY DEVICE CONTROL STRING	8.3.66
IGS	(Ps)	IDENTIFY GRAPHIC SUBREPERTOIRE	8.3.67
INT	(Fs)	INTERRUPT	8.3.69
MC	(Ps)	MEDIA COPY	8.3.83
MW	(C1)	MESSAGE WAITING	8.3.84
NUL	(C0)	NULL	8.3.89
PU1	(C1)	PRIVATE USE ONE	8.3.101
PU2	(C1)	PRIVATE USE TWO	8.3.102
REP	(Pn)	REPEAT	8.3.104
RIS	(Fs)	RESET TO INITIAL STATE	8.3.106
SEE	(Ps)	SELECT EDITING EXTENT	8.3.114
SEF	(Ps)	SHEET EJECT AND FEED	8.3.115
STS	(C1)	SET TRANSMIT STATE	8.3.141
SUB	(C0)	SUBSTITUTE	8.3.144

8.3 Definition of control functions

The control functions are listed in the alphabetical order of their acronyms. It is intended that the acronyms be retained in all translations of the text (see also clause E.1, annex E).

8.3.1 ACK — ACKNOWLEDGE

Notation: (C0)
Representation: 00/06

ACK is transmitted by a receiver as an affirmative response to the sender.

The use of ACK is defined in ISO 1745.

8.3.2 APC — APPLICATION PROGRAM COMMAND

Notation: (C1)
Representation: 09/15 or ESC 05/15

APC is used as the opening delimiter of a control string for application program use. The command string following may consist of a sequence of characters represented by bit combinations in the range 00/08 to 00/13 and 02/00 to 07/14. The control string is closed by the terminating delimiter STRING TERMINATOR (ST). The interpretation of the command string depends on the relevant application program.

8.3.3 BEL — BELL

Notation: (C0)
Representation: 00/07

BEL is used when there is a need to call for attention; it may control alarm or attention devices.

8.3.4 BPH — BREAK PERMITTED HERE

Notation: (C1)
Representation: 08/02 or ESC 04/02

BPH is used to indicate a point where a line break may occur when text is formatted. BPH may occur between two graphic characters, either or both of which may be SPACE.

8.3.5 BS — BACKSPACE

Notation: (C0)
Representation: 00/08

BS causes the active position to move one character position in the direction opposite to that of the character path.

The direction of the character path depends on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.6 CAN — CANCEL

Notation: (C0)
Representation: 01/08

CAN is used to indicate that the data preceding it in the data stream is in error. As a result, this data shall be ignored. The specific meaning of this control function shall be defined for each application and/or between sender and recipient.

8.3.7 CBT — CURSOR BACKWARD TABULATION

Notation: (Pn)
Representation: CSI Pn 05/10
Parameter default value: Pn = 1

CBT causes the active position to be moved to the character position corresponding to the *n*-th preceding character tabulation stop, where *n* equals the value of Pn.

The direction of the character path depends on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.8 CCH — CANCEL CHARACTER

Notation: (C1)
Representation: 09/04 or ESC 05/04

CCH is used to indicate that both the preceding graphic character in the data stream, (represented by one or more bit combinations) including SPACE, and the control function CCH itself are to be ignored for further interpretation of the data stream.

If the character preceding CCH in the data stream is a control function (represented by one or more bit combinations), the effect of CCH is not defined by this International Standard.

8.3.9 CHA — CURSOR CHARACTER ABSOLUTE

Notation: (Pn)
Representation: CSI Pn 04/07
Parameter default value: Pn = 1

CHA causes the active position to be moved to the *n*-th character position of the active line, where *n* equals the value of Pn.

The direction of the character path depends on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.10 CHT — CURSOR FORWARD TABULATION

Notation: (Pn)
Representation: CSI Pn 04/09
Parameter default value: Pn = 1

CHT causes the active position to be moved to the character position corresponding to the *n*-th following character tabulation stop, where *n* equals the value of Pn.

The direction of the character path depends on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.11 CMD — CODING METHOD DELIMITER

Notation: (Fs)
Representation: ESC 06/04

CMD is used as the delimiter of a string of data coded according to ISO 2022 and to switch to a general level of control.

The use of CMD is not mandatory if the higher level protocol defines means of delimiting the string, for instance, by specifying the length of the string.

8.3.12 CNL — CURSOR NEXT LINE

Notation: (Pn)
Representation: CSI Pn 04/05
Parameter default value: Pn = 1

CNL causes the active position to be moved to the first character position of the *n*-th following line, where *n* equals the value of Pn.

The direction of the character path and the direction of the line progression depend on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.13 CPL — CURSOR PRECEDING LINE

Notation: (Pn)
Representation: CSI Pn 04/06
Parameter default value: Pn = 1

CNL causes the active position to be moved to the first character position of the *n*-th preceding line, where *n* equals the value of Pn.

The direction of the character path and the direction of the line progression depend on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.14 CPR — ACTIVE POSITION REPORT

Notation: (Pn1;Pn2)
Representation: CSI Pn1;Pn2 05/02
Parameter default values: Pn1 = 1, Pn2 = 1

CPR is used to report the active position of the sending device as residing on the *n*-th line at the *m*-th character position, where *n* equals the value of Pn1 and *m* equals the value of Pn2.

CPR may be solicited by a DEVICE STATUS REPORT (DSR) or be sent unsolicited.

The direction of the character path and the direction of the line progression depend on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.15 CR — CARRIAGE RETURN

Notation: (C0)
Representation: 00/13

CR causes the active position to be moved to the line home position of the same line. The line home position is established by the parameter of SET LINE HOME (SLH).

The direction of the character path depends on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.16 CSI — CONTROL SEQUENCE INTRODUCER

Notation: (C1)
Representation: 09/11 or ESC 05/11

CSI is used as the first character of a control sequence, see 5.5.

8.3.17 CTC — CURSOR TABULATION CONTROL

Notation: (Ps...)
Representation: CSI Ps... 05/07
Parameter default value: Ps = 0

CTC causes one or more tabulation stops to be set or cleared, depending on the parameter values:

0 a character tabulation stop is set at the active position

1 a line tabulation stop is set at the active line

2 the character tabulation stop at the active position is cleared

3 the line tabulation stop at the active line is cleared

4 all character tabulation stops in the active line are cleared

5 all character tabulation stops are cleared

6 all line tabulation stops are cleared

In the case of parameter values 0, 2 or 4 the number of lines affected depends on the setting of the TABULATION STOP MODE (TSM).

8.3.18 CUB — CURSOR LEFT

Notation: (Pn)
Representation: CSI Pn 04/04
Parameter default value: Pn = 1

CUB causes the active position to be moved leftwards by *n* character positions if the character path is horizontal, or by *n* lines if the character path is vertical, where *n* equals the value of Pn.

Whether the character path is horizontal or vertical depends on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.19 CUD — CURSOR DOWN

Notation: (Pn)
Representation: CSI Pn 04/02
Parameter default value: Pn = 1

CUD causes the active position to be moved downwards by *n* lines if the character path is horizontal, or by *n* character positions if the character path is vertical, where *n* equals the value of Pn.

Whether the character path is horizontal or vertical depends on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.20 CUF — CURSOR RIGHT

Notation: (Pn)
Representation: CSI Pn 04/03
Parameter default value: Pn = 1

CUF causes the active position to be moved rightwards by *n* character positions if the character path is horizontal, or by *n* lines if the character path is vertical, where *n* equals the value of Pn.

Whether the character path is horizontal or vertical depends on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.21 CUP — CURSOR POSITION

Notation: (Pn1;Pn2)
Representation: CSI Pn1;Pn2 04/08
Parameter default values: Pn1 = 1; Pn2 = 1

CUP causes the active position to be moved to the *n*-th line at the *m*-th character position, where *n* equals the value of Pn1 and *m* equals the value of Pn2.

The direction of the character path and the direction of the line progression depend on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.22 CUU — CURSOR UP

Notation: (Pn)
Representation: CSI Pn 04/01
Parameter default value: Pn = 1

CUU causes the active position to be moved upwards by *n* lines if the character path is horizontal, or by *n* character positions if the character path is vertical, where *n* equals the value of Pn.

Whether the character path is horizontal or vertical depends on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.23 CVT — CURSOR LINE TABULATION

Notation: (Pn)
Representation: CSI Pn 05/09
Parameter default value: Pn = 1

CVT causes the active position to be moved to the corresponding character position of the line corresponding to the *n*-th following line tabulation stop, where *n* equals the value of Pn.

The direction of the line progression depends on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.24 DA — DEVICE ATTRIBUTES

Notation: (Ps)
Representation: CSI Ps 06/03
Parameter default value: Ps = 0

With a parameter value not equal to 0, DA is used to identify the device which sends the DA. The parameter value is a device type identification code according to some register which is to be established. If the parameter value is 0, DA is used to request an identifying DA from a device.

8.3.25 DAQ — DEFINE AREA QUALIFICATION

Notation: (Ps...)
Representation: CSI Ps... 06/15
Parameter default value: Ps = 0

DAQ is used to indicate that the active position is the first character position of a qualified area. The last character position of the qualified area is the character position immediately preceding the first character position of the following qualified area.

The parameter value designates the type of qualified area:

0 unprotected and unguarded
1 protected and guarded
2 graphic character input
3 numeric input
4 alphabetic input
5 input aligned on the last character position of the qualified area
6 fill with ZEROs
7 set a character tabulation stop at the active position (the first character position of the qualified area) to indicate the beginning of a field
8 protected and unguarded
9 fill with SPACEs
10 input aligned on the first character position of the qualified area
11 the order of the character positions in the input field is reversed, i.e. the last position in each line becomes the first and vice versa; input begins at the new first position

This control function operates independently of the setting of the TABULATION STOP MODE (TSM). The character tabulation stop set by parameter 7 applies to the active line only.

8.3.26 DCH — DELETE CHARACTER

Notation: (Pn)
Representation: CSI Pn 05/00
Parameter default value: Pn = 1

DCH causes the contents of the active position and, depending on the setting of the CHARACTER EDITING MODE (HEM), the contents of the *n*-1 preceding or following character positions to be removed, where *n* equals the value of Pn. The resulting gap is closed by shifting the contents of the adjacent character positions towards the active position. At the other end of the shifted part, *n* character positions are put into the erased state.

The extent of the shifted part is established by SELECT EDITING EXTENT (SEE).

The effect of DCH on the start or end of a selected area, the start or end of a qualified area, or a tabulation stop in the shifted part is not defined by this International Standard.

The direction of the character path and the direction of the line progression depend on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.27 DCS — DEVICE CONTROL STRING

Notation: (C1)
Representation: 09/00 or ESC 05/00

DCS is used as the opening delimiter of a control string for device control use. The command string following may consist of a sequence of characters represented by bit combinations in the range 00/08 to 00/13 and 02/00 to 07/14. The control string is closed by the terminating delimiter STRING TERMINATOR (ST).

The command string represents either one or more commands for the receiving device, or one or more status reports from the sending device. The purpose and the format of the command string are specified by the most recent occurrence of IDENTIFY DEVICE CONTROL STRING (IDCS), if any, or depend on the sending and/or the receiving device.

8.3.28 DC1 — DEVICE CONTROL ONE

Notation: (C0)
Representation: 01/01

DC1 is primarily intended for turning on or starting an ancillary device. If it is not required for this purpose, it may be used to restore a device to the basic mode of operation (see also DC2 and DC3), or any other device control function not provided by other DCs.

When used for data flow control, DC1 is sometimes called "X-ON".

8.3.29 DC2 — DEVICE CONTROL TWO

Notation: (C0)
Representation: 01/02

DC2 is primarily intended for turning on or starting an ancillary device. If it is not required for this purpose, it may be used to set a device to a special mode of operation (in which case DC1 is used to restore the device to the basic mode), or for any other device control function not provided by other DCs.

8.3.30 DC3 — DEVICE CONTROL THREE

Notation: (C0)
Representation: 01/03

DC3 is primarily intended for turning off or stopping an ancillary device. This function may be a secondary level stop, for example wait, pause, stand-by or halt (in which case DC1 is used to restore normal operation). If it is not required for this purpose, it may be used for any other device control function not provided by other DCs.

When used for data flow control, DC3 is sometimes called "X-OFF".

8.3.31 DC4 — DEVICE CONTROL FOUR

Notation: (C0)
Representation: 01/04

DC4 is primarily intended for turning off, stopping or interrupting an ancillary device. If it is not required for this purpose, it may be used for any other device control function not provided by other DCs.

8.3.32 DEL — DELETE

Notation: (Cx)
Representation: 07/15

DEL was originally used to erase or obliterate an erroneous or unwanted character in punched tape. DEL may be used for media-fill or time-fill. DEL characters may be inserted into, or removed from, a data stream without affecting the information content of that stream, but such action may affect the information layout and/or the control of equipment.

NOTE — When a set of 96 graphic characters is invoked into columns 02 to 07, or when the last character of such a set is invoked by a single-shift function, bit combination 07/15 will not have the meaning of DEL.

8.3.33 DL — DELETE LINE

Notation: (Pn)
Representation: CSI Pn 04/13
Parameter default value: Pn = 1

DL causes the contents of the active line and, depending on the setting of the LINE EDITING MODE (VEM), the contents of the $n-1$ preceding or following lines to be removed, where n equals the value of Pn. The resulting gap is closed by shifting the contents of a number of adjacent lines towards the active line. At the other end of the shifted part, n lines are put into the erased state.

The extent of the shifted part is established by SELECT EDITING EXTENT (SEE).

Any occurrences of the start or end of a selected area, the start or end of a qualified area, or a tabulation stop in the shifted part, are also shifted.

If the TABULATION STOP MODE (TSM) is set to SINGLE, character tabulation stops are cleared in the lines that are put into the erased state.

The active position is moved to the line home position within the active line. The line home position is established by the parameter of SET LINE HOME (SLH).

The direction of the character path and the direction of the line progression depend on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.34 DLE — DATA LINK ESCAPE

Notation: (C0)
Representation: 01/00

DLE is used exclusively to provide supplementary transmission control functions.

The use of DLE is defined in ISO 1745.

8.3.35 DMI — DISABLE MANUAL INPUT

Notation: (Fs)
Representation: ESC 06/00

DMI causes the manual input facilities of a device to be disabled.

8.3.36 DSR — DEVICE STATUS REPORT

Notation: (Ps)
Representation: CSI Ps 06/14
Parameter default value: Ps = 0

DSR is used either to report the status of the sending device or to request a status report from the receiving device, depending on the parameter values:

0 ready, no malfunction detected

1 busy, another DSR must be requested later

2 busy, another DSR will be sent later

3 some malfunction detected, another DSR must be requested later

4 some malfunction detected, another DSR will be sent later

5 a DSR is requested

6 a report of the active position in the form of ACTIVE POSITION REPORT (CPR) is requested

DSR with parameter value 0, 1, 2, 3 or 4 may be sent either unsolicited or as a response to a request such as a DSR with a parameter value 5 or MESSAGE WAITING (MW).

8.3.37 DTA — DIMENSION TEXT AREA

Notation: (Pn1;Pn2)
Representation: CSI Pn1;Pn2 02/00 05/04
No parameter default value.

DTA is used to establish the dimensions of the text area for subsequent pages.

The established dimensions remain in effect until the next occurrence of DTA in the data stream.

Pn1 specifies the dimension in the direction perpendicular to the character path

Pn2 specifies the dimension in the direction parallel to the character path

The unit in which the parameter value is expressed depends on the setting of the POSITIONING UNIT MODE (PUM). If that mode is set to SIZE, the unit is that established by SELECT SIZE UNIT (SSU).

The direction of the character path and the direction of the line progression depend on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.38 EA — ERASE IN AREA

Notation: (Ps)
Representation: CSI Ps 04/15
Parameter default value: Ps = 0

EA causes some or all character positions in the active qualified area, i.e. the qualified area which contains the active position, to be put into the erased state, depending on the parameter values:

0 the active position and the character positions up to the end of the qualified area are put into the erased state

1 the character positions from the beginning of the qualified area up to and including the active position are put into the erased state

2 all character positions of the qualified area are put into the erased state

Whether the character positions of protected areas are put into the erased state, or the character positions of unprotected areas only, depends on the setting of the ERASURE MODE (ERM).

The direction of the character path and the direction of the line progression depend on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.39 ECH — ERASE CHARACTER

Notation: (Pn)
Representation: CSI Pn 05/08
Parameter default value: Pn = 1

ECH causes the active position and the $n - 1$ following character positions to be put into the erased state, where n equals the value of Pn.

Whether the character positions of protected areas are put into the erased state, or the character positions of unprotected areas only, depends on the setting of the ERASURE MODE (ERM).

The direction of the character path and the direction of the line progression depend on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.40 ED — ERASE IN PAGE

Notation: (Ps)
Representation: CSI Ps 04/10
Parameter default value: Ps = 0

ED causes some or all character positions of the active page, i.e. the page which contains the active position, to be put into the erased state, depending on the parameter values:

0 the active position and the character positions up to the end of the page are put into the erased state

1 the character positions from the beginning of the page up to and including the active position are put into the erased state

2 all character positions of the page are put into the erased state

Whether the character positions of protected areas are put into the erased state, or the character positions of unprotected areas only, depends on the setting of the ERASURE MODE (ERM).

The direction of the character path and the direction of the line progression depend on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.41 EF — ERASE IN FIELD

Notation: (Ps)
Representation: CSI Ps 04/14
Parameter default value: Ps = 0

EF causes some or all character positions of the active field, i.e. the field which contains the active position, to be put into the erased state, depending on the parameter values:

0 the active position and the character positions up to the end of the field are put into the erased state

1 the character positions from the beginning of the field up to and including the active position are put into the erased state

2 all character positions of the field are put into the erased state

Whether the character positions of protected areas are put into the erased state, or the character positions of unprotected areas only, depends on the setting of the ERASURE MODE (ERM).

The direction of the character path and the direction of the line progression depend on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.42 EL — ERASE IN LINE

Notation: (Ps)
Representation: CSI Ps 04/11
Parameter default value: Ps = 0

EL causes some or all character positions of the active line, i.e. the line which contains the active position, to be put into the erased state, depending on the parameter values:

0 the active position and the character positions up to the end of the line are put into the erased state

1 the character positions from the beginning of the line up to and including the active position are put into the erased state

2 all character positions of the line are put into the erased state

Whether the character positions of protected areas are put into the erased state, or the character positions of unprotected areas only, depends on the setting of the ERASURE MODE (ERM).

The direction of the character path and the direction of the line progression depend on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.43 EM — END OF MEDIUM

Notation: (C0)
Representation: 01/09

EM is used to identify the physical end of a medium, or the end of the used portion of a medium, or the end of the wanted portion of data recorded on a medium.

8.3.44 EMI — ENABLE MANUAL INPUT

Notation: (Fs)
Representation: ESC 06/02

EMI is used to enable the manual input facilities of a device.

8.3.45 ENQ — ENQUIRY

Notation: (C0)
Representation: 00/05

ENQ is transmitted by a sender as a request for a response from a receiver.

The use of ENQ is defined in ISO 1745.

8.3.46 EOT — END OF TRANSMISSION

Notation: (C0)
Representation: 00/04

EOT is used to indicate the conclusion of the transmission of one or more texts.

The use of EOT is defined in ISO 1745.

8.3.47 EPA — END OF GUARDED AREA

Notation: (C1)
Representation: 09/07 or ESC 05/07

EPA is used to indicate that the active position is the last of a string of character positions, the contents of which are protected against manual alteration, are guarded against transmission or transfer, depending on the setting of the GUARDED AREA TRANSFER MODE (GATM), and may be protected against erasure, depending on the setting of the ERASURE MODE (ERM). The beginning of this string is indicated by START OF GUARDED AREA (SPA).

8.3.48 ESA — END OF SELECTED AREA

Notation: (C1)
Representation: 08/07 or ESC 04/07

ESA is used to indicate that the active position is the last of a string of character positions, the contents of which are eligible to be transmitted in the form of a data stream or transferred to an auxiliary input/output device. The beginning of this string is indicated by START OF SELECTED AREA (SSA).

8.3.49 ESC — ESCAPE

Notation: (C0)
Representation: 01/11

ESC is used for code extension purposes. It causes the meanings of a limited number of bit combinations following it in the data stream to be changed.

The use of ESC is defined in ISO 2022.

8.3.50 ETB — END OF TRANSMISSION BLOCK

Notation: (C0)
Representation: 01/07

ETB is used to indicate the end of a block of data where the data are divided into such blocks for transmission purposes.

The use of ETB is defined in ISO 1745.

8.3.51 ETX — END OF TEXT

Notation: (C0)
Representation: 00/03

ETX is used to indicate the end of a text.

The use of ETX is defined in ISO 1745.

8.3.52 FF — FORM FEED

Notation: (C0)
Representation: 00/12

FF causes the active position to be moved to the corresponding character position on a predetermined line of the next form or page.

8.3.53 FNK — FUNCTION KEY

Notation: (Pn)
Representation: CSI Pn 02/00 05/07
No pararameter default value.

FNK is a control function in which the parameter identifies the function key which has been operated.

8.3.54 FNT — FONT SELECTION

Notation: (Ps1;Ps2)
Representation: CSI Ps1;Ps2 02/00 04/04
Parameter default values: Ps1 = 0; Ps2 = 0

FNT is used to identify the character font to be selected as primary or alternative font by subsequent occurrences of SELECT GRAPHIC RENDITION (SGR) in the data stream. Ps1 specifies the primary or alternative font concerned:

0 primary font
1 first alternative font
2 second alternative font
3 third alternative font
4 fourth alternative font
5 fifth alternative font
6 sixth alternative font
7 seventh alternative font
8 eighth alternative font
9 ninth alternative font

Ps2 identifies the character font according to some register which is to be established.

8.3.55 GCC — GRAPHIC CHARACTER COMPOSITION

Notation: (Ps)
Representation: CSI Ps 02/00 05/15
Parameter default value: Ps = 0

GCC is used to indicate that two or more graphic characters are to be combined into one graphic symbol. GCC with a parameter value of 0 indicates that the following two graphic characters are to be presented as a single symbol; GCC with a parameter value of 1 and GCC with a parameter value of 2 indicate respectively the beginning and the end of a string of graphic characters which are to be combined into one graphic symbol for presentation.

NOTE — GCC does not explicitly specify the relative sizes or placements of the component parts of a composite graphic symbol. In the simplest case, two components may be "half-width" and side-by-side. For example, in Japanese text a pair of characters may be presented side-by-side, and occupy the space of a normal-size Kanji character.

8.3.56 GSM — GRAPHIC SIZE MODIFICATION

Notation: (Pn1;Pn2)
Representation: CSI Pn1;Pn2 02/00 04/02
Parameter default values: Pn1 = 100; Pn2 = 100

GSM is used to modify for subsequent text the height and/or the width of all primary and alternative fonts identified by FONT SELECTION (FNT) and established by GRAPHIC SIZE SELECTION (GSS). The established values remain in effect until the next occurrence of GSM or GSS in the data steam.

Pn1 specifies the height as a percentage of the height established by GSS

Pn2 specifies the width as a percentage of the width established by GSS

8.3.57 GSS — GRAPHIC SIZE SELECTION

Notation: (Pn)
Representation: CSI Pn 02/00 04/03
No parameter default value.

GSS is used to establish for subsequent text the height and the width of all primary and alternative fonts identified by FONT SELECTION (FNT). The established values remain in effect until the next occurrence of GSS in the data stream.

Pn specifies the height, the width is implicitly defined by the height.

The unit in which the parameter value is expressed is that established by SELECT SIZE UNIT (SSU).

8.3.58 HPA — CHARACTER POSITION ABSOLUTE

Notation: (Pn)
Representation: CSI Pn 06/00
Parameter default value: Pn = 1

HPA causes the active position to be moved to position *n* within the active line, where *n* equals the value of Pn.

The unit in which the parameter value is expressed depends on the setting of the POSITIONING UNIT MODE (PUM). If that mode is set to SIZE, the unit is that established by SELECT SIZE UNIT (SSU).

The direction of the character path depends on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.59 HPB — CHARACTER POSITION BACKWARD

Notation: (Pn)
Representation: CSI Pn 06/10
Parameter default value: Pn = 1

HPB causes the active position to be moved by *n* units in the direction opposite to that of the character path, where *n* equals the value of Pn.

The unit in which the parameter value is expressed depends on the setting of the POSITIONING UNIT MODE (PUM). If that mode is set to SIZE, the unit is that established by SELECT SIZE UNIT (SSU).

The direction of the character path depends on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.60 HPR — CHARACTER POSITION FORWARD

Notation: (Pn)
Representation: CSI Pn 06/01
Parameter default value: Pn = 1

HPR causes the active position to be moved by *n* units in the direction of the character path, where *n* equals the value of Pn.

The unit in which the parameter value is expressed depends on the setting of the POSITIONING UNIT MODE (PUM). If that mode is set to SIZE, the unit is that established by SELECT SIZE UNIT (SSU).

The direction of the character path depends on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.61 HT — CHARACTER TABULATION

Notation: (C0)
Representation: 00/09

HT causes the active position to be moved to the following character tabulation stop.

In addition, if that following character tabulation stop has been set by TABULATION ALIGN CENTRE (TAC), TABULATION ALIGN LEADING EDGE (TALE), TABULATION ALIGN TRAILING EDGE (TATE) or TABULATION CENTRED ON CHARACTER (TCC), HT indicates the beginning of a string of text which is to be positioned within a line according to the properties of that tabulation stop. The end of the string is indicated by the next occurrence of HT or CARRIAGE RETURN (CR) or NEXT LINE (NEL) in the data stream.

The direction of the character path and the direction of the line progression depend on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.62 HTJ — CHARACTER TABULATION WITH JUSTIFICATION

Notation: (C1)
Representation: 08/09 or ESC 04/09

HTJ causes the contents of the active field to be shifted forward so that it ends at the character position preceding the following character tabulation stop. The active position is moved to that following character tabulation stop. The character positions which precede the beginning of the shifted string are put into the erased state.

The direction of the character path and the direction of the line progression depend on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.63 HTS — CHARACTER TABULATION SET

Notation: (C1)
Representation: 08/08 or ESC 04/08

HTS causes a character tabulation stop to be set at the active position.

The number of lines affected depends on the setting of the TABULATION STOP MODE (TSM).

8.3.64 HVP — CHARACTER AND LINE POSITION

Notation: (Pn1;Pn2)
Representation: CSI Pn1;Pn2 06/06
Parameter default values: Pn1 = 1; Pn2 = 1

HVP causes the active position to be moved to position *n* in the direction of the line progression and to position *m* in the direction of the character path, where *n* equals the value of Pn1 and *m* equals the value of Pn2.

The unit in which the parameter values are expressed depends on the setting of the POSITIONING UNIT MODE (PUM). If that mode is set to SIZE, the unit is that established by SELECT SIZE UNIT (SSU).

The direction of the character path and the direction of the line progression depend on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.65 ICH — INSERT CHARACTER

Notation: (Pn)
Representation: CSI Pn 04/00
Parameter default value: Pn = 1

ICH is used to prepare the insertion of n characters, by putting into the erased state the active position and, depending on the setting of the CHARACTER EDITING MODE (HEM), the $n - 1$ preceding or following character positions, where n equals the value of Pn. The previous contents of the active position and an adjacent string of character positions are shifted away from the active position. The contents of n character positions at the other end of the shifted part are removed.

The extent of the shifted part is established by SELECT EDITING EXTENT (SEE).

The effect of ICH on the start or end of a selected area, the start or end of a qualified area, or a tabulation stop in the shifted part, is not defined by this International Standard.

The direction of the character path and the direction of the line progression depend on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.66 IDCS — IDENTIFY DEVICE CONTROL STRING

Notation: (Ps)
Representation: CSI Ps 02/00 04/15
No parameter default value.

IDCS is used to specify the purpose and format of the command string of subsequent DEVICE CONTROL STRINGs (DCS). The specified purpose and format remain in effect until the next occurrence of IDCS in the data stream.

The parameter values are

1 reserved for use with the DIAGNOSTIC state of the STATUS REPORT TRANSFER MODE (SRTM)

2 reserved for Dynamically Redefinable Character Sets (DRCS) according to ISO 2022

The format and interpretation of the command string corresponding to these parameter values are to be defined in appropriate standards. If this control function is used to identify a private command string, a private parameter value shall be used.

8.3.67 IGS — IDENTIFY GRAPHIC SUBREPERTOIRE

Notation: (Ps)
Representation: CSI Ps 02/00 04/13
Parameter default value: Ps = 0

IGS is used to indicate that a subrepertoire of the graphic character repertoire of ISO 6937 is used in the subsequent text.

0 identifies the complete graphic character repertoire of ISO 6937

With a parameter value not equal to 0, IGS identifies a graphic character subrepertoire registered in accordance with ISO 7350.

8.3.68 IL — INSERT LINE

Notation: (Pn)
Representation: CSI Pn 04/12
Parameter default value: Pn = 1

IL is used to prepare the insertion of n lines, by putting into the erased state the active line and, depending on the setting of the LINE EDITING MODE (VEM), the $n - 1$ preceding or following lines, where n equals the value of Pn. The previous contents of the active line and of adjacent lines are shifted away from the active line. The contents of n lines at the other end of the shifted part are removed.

The extent of the shifted part is established by SELECT EDITING EXTENT (SEE).

Any occurrences of the start or end of a selected area, the start or end of a qualified area, or a tabulation stop in the shifted part, are also shifted.

If the TABULATION STOP MODE (TSM) is set to SINGLE, character tabulation stops are cleared in the lines that are put into the erased state.

The active position is moved to the line home position within the active line. The line home position is established by the parameter of SET LINE HOME (SLH).

The direction of the character path and the direction of the line progression depend on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.69 INT — INTERRUPT

Notation: (Fs)
Representation: ESC 06/01

INT is used to indicate to the receiving device that the current process is to be interrupted and an agreed procedure is to be initiated. This control function is applicable to either direction of transmission.

8.3.70 IS1 — INFORMATION SEPARATOR ONE (US — UNIT SEPARATOR)

Notation: (C0)
Representation: 01/15

IS1 is used to separate and qualify data logically; its specific meaning has to be defined for each application. If this control function is used in hierarchical order, it may delimit a data item called a unit, see 8.2.10.

8.3.71 IS2 — INFORMATION SEPARATOR TWO (RS — RECORD SEPARATOR)

Notation: (C0)
Representation: 01/14

IS2 is used to separate and qualify data logically; its specific meaning has to be defined for each application. If this control function is used in hierarchical order, it may delimit a data item called a record, see 8.2.10.

8.3.72 IS3 — INFORMATION SEPARATOR THREE (GS — GROUP SEPARATOR)

Notation: (C0)
Representation: 01/13

IS3 is used to separate and qualify data logically; its specific meaning has to be defined for each application. If this control function is used in hierarchical order, it may delimit a data item called a group, see 8.2.10.

8.3.73 IS4 — INFORMATION SEPARATOR FOUR (FS — FILE SEPARATOR)

Notation: (C0)
Representation: 01/12

IS4 is used to separate and qualify data logically; its specific meaning has to be defined for each application. If this control function is used in hierarchical order, it may delimit a data item called a file, see 8.2.10.

8.3.74 JFY — JUSTIFY

Notation: (Ps...)
Representation: CSI Ps... 02/00 04/06
Parameter default value: Ps = 0

JFY is used to indicate the beginning of a string of graphic characters that are to be justified according to the layout specified by the parameter values, see annex C:

0 no justification, end of justification of preceding text
1 word fill
2 word space
3 letter space
4 hyphenation
5 flush to line home position margin
6 centre between line home position and line limit position margins
7 flush to line limit position margin
8 Italian hyphenation

The end of the string to be justified is indicated by the next occurrence of JFY in the data stream.

The line home position is established by the parameter of SET LINE HOME (SLH). The line limit position is established by the parameter of SET LINE LIMIT (SLL).

8.3.75 LF — LINE FEED

Notation: (C0)
Representation: 00/10

LF causes the active position to be moved to the corresponding character position of the following line.

The direction of the line progression depends on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.76 LS0 — LOCKING-SHIFT ZERO

Notation: (C0)
Representation: 00/15

LS0 is used for code extension purposes. It causes the meanings of the bit combinations following it in the data stream to be changed.

The use of LS0 is defined in ISO 2022.

NOTE — LS0 is used in 8-bit environments only; in 7-bit environments SHIFT-IN (SI) is used instead.

8.3.77 LS1 — LOCKING-SHIFT ONE

Notation: (C0)
Representation: 00/14

LS1 is used for code extension purposes. It causes the meanings of the bit combinations following it in the data stream to be changed.

The use of LS1 is defined in ISO 2022.

NOTE — LS1 is used in 8-bit environments only; in 7-bit environments SHIFT-OUT (SO) is used instead.

8.3.78 LS1R — LOCKING-SHIFT ONE RIGHT

Notation: (Fs)
Representation: ESC 07/14

LS1R is used for code extension purposes. It causes the meanings of the bit combinations following it in the data stream to be changed.

The use of LS1R is defined in ISO 2022.

8.3.79 LS2 — LOCKING-SHIFT TWO

Notation: (Fs)
Representation: ESC 06/14

LS2 is used for code extension purposes. It causes the meanings of the bit combinations following it in the data stream to be changed.

The use of LS2 is defined in ISO 2022.

8.3.80 LS2R — LOCKING-SHIFT TWO RIGHT

Notation: (Fs)
Representation: ESC 07/13

LS2R is used for code extension purposes. It causes the meanings of the bit combinations following it in the data stream to be changed.

The use of LS2R is defined in ISO 2022.

8.3.81 LS3 — LOCKING-SHIFT THREE

Notation: (Fs)
Representation: ESC 06/15

LS3 is used for code extension purposes. It causes the meanings of the bit combinations following it in the data stream to be changed.

The use of LS3 is defined in ISO 2022.

8.3.82 LS3R — LOCKING-SHIFT THREE RIGHT

Notation: (Fs)
Representation: ESC 07/12

LS3R is used for code extension purposes. It causes the meanings of the bit combinations following it in the data stream to be changed.

The use of LS3R is defined in ISO 2022.

8.3.83 MC — MEDIA COPY

Notation: (Ps)
Representation: CSI Ps 06/09
Parameter default value: Ps = 0

MC is used either to initiate a transfer of data from or to an auxiliary input/output device or to enable or disable the relay of the received data stream to an auxiliary input/output device, depending on the parameter value:

0 initiate transfer to a primary auxiliary device
1 initiate transfer from a primary auxiliary device
2 initiate transfer to a secondary auxiliary device
3 initiate transfer from a secondary auxiliary device
4 stop relay to a primary auxiliary device
5 start relay to a primary auxiliary device
6 stop relay to a secondary auxiliary device
7 start relay to a secondary auxiliary device

This control function may not be used to switch on or off an auxiliary device.

8.3.84 MW — MESSAGE WAITING

Notation: (C1)
Representation: 09/05 or ESC 05/05

MW is used to set a message waiting indicator in the receiving device. An appropriate acknowledgement to the receipt of MW may be given by using DEVICE STATUS REPORT (DSR).

8.3.85 NAK — NEGATIVE ACKNOWLEDGE

Notation: (C0)
Representation: 01/05

NAK is transmitted by a receiver as a negative response to the sender.

The use of NAK is defined in ISO 1745.

8.3.86 NBH — NO BREAK HERE

Notation: (C1)
Representation: 08/03 or ESC 04/03

NBH is used to indicate a point where a line break shall not occur when text is formatted. NBH may occur between two graphic characters either or both of which may be SPACE.

8.3.87 NEL — NEXT LINE

Notation: (C1)
Representation: 08/05 or ESC 04/05

NEL causes the active position to be moved to the line home position of the following line.

The line home position is established by the parameter of SET LINE HOME (SLH).

The direction of the character path and the direction of the line progression depend on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.88 NP — NEXT PAGE

Notation: (Pn)
Representation: CSI Pn 05/05
Parameter default value: Pn = 1

NP causes the *n*-th following page to be displayed, where *n* equals the value of Pn.

The effect of this control function on the active position is not defined by this International Standard.

8.3.89 NUL — NULL

Notation: (C0)
Representation: 00/00

NUL is used for media-fill or time-fill. NUL characters may be inserted into, or removed from, a data stream without affecting the information content of that stream, but such action may affect the information layout and/or the control of equipment.

8.3.90 OSC — OPERATING SYSTEM COMMAND

Notation: (C1)
Representation: 09/13 or ESC 05/13

OSC is used as the opening delimiter of a control string for operating system use. The command string following may consist of a sequence of characters represented by bit combinations in the range 00/08 to 00/13 and 02/00 to 07/14. The control string is closed by the terminating delimiter STRING TERMINATOR (ST). The interpretation of the command string depends on the relevant operating system.

8.3.91 PEC — PRESENTATION EXPAND OR CONTRACT

Notation: (Ps)
Representation: CSI Ps 02/00 05/10
Parameter default value: Ps = 0

PEC is used to establish graphic characters' spacing and the extent for subsequent text. The spacing and the extent are specified in the direction parallel to the character path as multiples of the spacing explicitly established and the extent implicitly established by the most recent occurrence of SET CHARACTER SPACING (SCS) or of SELECT CHARACTER SPACING (SHS) or of SPACING INCREMENT (SPI) in the data stream. The established spacing and extent remain in effect until the next occurrence of PEC, of SCS, of SHS or of SPI in the data stream. The parameter values are

0 normal (as specified by SHS or SPI)

1 expanded (multiplied by a factor not greater than 2)

2 condensed (multiplied by a factor not less than 0,5)

The direction of the character path depends on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.92 PFS — PAGE FORMAT SELECTION

Notation: (Ps)
Representation: CSI Ps 02/00 04/10
Parameter default value: Ps = 0

PFS is used to establish the available area for the imaging of pages of text based on paper size. The pages are introduced by the subsequent occurrence of FORM FEED (FF) in the data stream.

The established image area remains in effect until the next occurrence of PFS in the data stream. The parameter values are

0 tall basic text communication format

1 wide basic text communication format

2 tall basic A4 format

3 wide basic A4 format

4 tall North American letter format

5 wide North American letter format

6 tall extended A4 format

7 wide extended A4 format

8 tall North American legal format

9 wide North American legal format

10 A4 short lines format

11 A4 long lines format

12 B5 short lines format

13 B5 long lines format

14 B4 short lines format

15 B4 long lines format

8.3.93 PLD — PARTIAL LINE FORWARD

Notation: (C1)
Representation: 08/11 or ESC 04/11

PLD causes the active position to be moved to the corresponding character position of an imaginary line with a partial offset in the direction of the line progression. This offset should be sufficient either to image following characters as subscripts until the first following occurrence of PARTIAL LINE BACKWARD (PLU) in the data stream, or, if preceding characters were imaged as superscripts, to restore imaging of following characters to the active line.

Any interactions between PLD and format effectors other than PLU are not defined by this International Standard.

The direction of the line progression depends on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.94 PLU — PARTIAL LINE BACKWARD

Notation: (C1)
Representation: 08/12 or ESC 04/12

PLU causes the active position to be moved to the corresponding character position of an imaginary line with a partial offset in the direction opposite to that of the line progression. This offset should be sufficient either to image following characters as superscripts until the first following occurrence of PARTIAL LINE FORWARD (PLD) in the data stream, or, if preceding characters were imaged as subscripts, to restore imaging of following characters to the active line.

Any interactions between PLU and format effectors other than PLD are not defined by this International Standard.

The direction of the line progression depends on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.95 PM — PRIVACY MESSAGE

Notation: (C1)
Representation: 09/14 or ESC 05/14

PM is used as the opening delimiter of a control string for privacy message use. The command string following may consist of a sequence of characters represented by bit combinations in the range 00/08 to 00/13 and 02/00 to 07/14. The control string is closed by the terminating delimiter STRING TERMINATOR (ST). The interpretation of the command string depends on the relevant privacy discipline.

8.3.96 PP — PRECEDING PAGE

Notation: (Pn)
Representation: CSI Pn 05/06
Parameter default value: Pn = 1

PP causes the n-th preceding page to be displayed, where n equals the value of Pn. The effect of this control function on the active position is not defined by this International Standard.

8.3.97 PPA — PAGE POSITION ABSOLUTE

Notation: (Pn)
Representation: CSI Pn 02/00 05/00
Parameter default value: Pn = 1

PPA causes the active position to be moved to the corresponding character and line position on the n-th page, where n equals the value of Pn.

8.3.98 PPB — PAGE POSITION BACKWARD

Notation: (Pn)
Representation: CSI Pn 02/00 05/02
Parameter default value: Pn = 1

PPB causes the active position to be moved to the corresponding character and line position on the n-th preceding page, where n equals the value of Pn.

8.3.99 PPR — PAGE POSITION FORWARD

Notation: (Pn)
Representation: CSI Pn 02/00 05/01
Parameter default value: Pn = 1

PPR causes the active position to be moved to the corresponding character and line position on the n-th following page, where n equals the value of Pn.

8.3.100 PTX — PARALLEL TEXTS

Notation: (Ps)
Representation: CSI Ps 05/12
Parameter default value: Ps = 0

PTX is used to delimit strings of graphic characters that are communicated one after another in the data stream but that are intended to be presented in parallel with one another, usually in adjacent lines.

The parameter values are

0 end of parallel texts

1 beginning of a string of principal parallel text

2 beginning of a string of supplementary parallel text

3 beginning of a string of supplementary Japanese phonetic annotation

4 beginning of a string of supplementary Chinese phonetic annotation

5 end of a string of supplementary phonetic annotations

PTX with a parameter value of 1 indicates the beginning of the string of principal text intended to be presented in parallel with one or more strings of supplementary text.

PTX with a parameter value of 2, 3 or 4 indicates the beginning of a string of supplementary text that is intended to be presented in parallel with either a string of principal text or the immediately preceding string of supplementary text, if any; at the same time it indicates the end of the preceding string of principal text or of the immediately preceding string of supplementary text, if any. The end of a string of supplementary text is indicated by a subsequent occurrence of PTX with a parameter value other than 1.

PTX with a parameter value of 0 indicates the end of the strings of text intended to be presented in parallel with one another.

The direction of the character path depends on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

NOTE — PTX does not explicitly specify the relative placement of the strings of principal and supplementary parallel texts, or the relative sizes of graphic characters in the strings of parallel text. A string of supplementary text is normally presented in a line adjacent to the line containing the string of principal text, or adjacent to the line containing the immediately preceding string of supplementary text, if any. The first graphic character of the string of principal text and the first graphic character of a string of supplementary text are normally presented in the same character position of their respective lines. However, a string of supplementary text longer (when presented) than the associated string of principal text may be centred on that string. In the case of long strings of text, such as paragraphs in different languages, the strings may be presented in successive lines in parallel columns, with their beginnings aligned with one another and the shorter of the paragraphs followed by an appropriate amount of "white space".

Japanese phonetic annotation typically consists of a few half-size or smaller Kana characters which indicate the pronunciation or interpretation of one or more Kanji characters and are presented above those Kanji characters if the character path is horizontal, or to the right of them if the character path is vertical.

Chinese phonetic annotation typically consists of a few Pinyin characters which indicate the pronunciation of one or more Hanzi characters and are presented above those Hanzi characters. Alternatively, the Pinyin characters may be presented in the same line as the Hanzi characters and following the respective Hanzi characters. The Pinyin characters will then be presented within enclosing pairs of parentheses.

8.3.101 PU1 — PRIVATE USE ONE

Notation: (C1)
Representation: 09/01 or ESC 05/01

PU1 is reserved for a function without standardized meaning for private use as required, subject to the prior agreement between the sender and the recipient of the data.

8.3.102 PU2 — PRIVATE USE TWO

Notation: (C1)
Representation: 09/02 or ESC 05/02

PU2 is reserved for a function without standardized meaning for private use as required, subject to the prior agreement between the sender and the recipient of the data.

8.3.103 QUAD — QUAD

Notation: (Ps...)
Representation: CSI Ps... 02/00 04/08
Parameter default value: Ps = 0

QUAD is used to indicate the end of a string of graphic characters that are to be positioned on a single line according to the layout specified by the parameter values, see annex C:

0 flush to line home position margin

1 flush to line home position margin and fill with leader

2 centre between line home position and line limit position margins

3 centre between line home position and line limit position margins and fill with leader

4 flush to line limit position margin

5 flush to line limit position margin and fill with leader

6 flush to both margins

The beginning of the string to be positioned is indicated by the preceding occurrence in the data stream of either QUAD or one of the following formator functions: FORM FEED (FF), CHARACTER AND LINE POSITION (HVP), INDEX (IND)*, LINE FEED (LF), NEXT LINE (NEL), PAGE POSITION ABSOLUTE (PPA), PAGE POSITION BACKWARD (PPB), PAGE POSITION FORWARD (PPR), REVERSE LINE FEED (RI), LINE POSITION ABSOLUTE (VPA), LINE POSITION BACKWARD (VPB), LINE POSITION FORWARD (VPR), or LINE TABULATION (VT).

* See annex E.

The line home position is established by the parameter of SET LINE HOME (SLH). The line limit position is established by the parameter of SET LINE LIMIT (SLL).

8.3.104 REP — REPEAT

Notation: (Pn)
Representation: CSI Pn 06/02
Parameter default value: Pn = 1

REP is used to indicate that the preceding character in the data stream, if it is a graphic character (represented by one or more bit combinations) including SPACE, is to be repeated n times, where n equals the value of Pn. If the character preceding REP is a control function or part of a control function, the effect of REP is not defined by this International Standard.

8.3.105 RI — REVERSE LINE FEED

Notation: (C1)
Representation: 08/13 or ESC 04/13

RI causes the active position to be moved to the corresponding character position of the preceding line.

The direction of the line progression depends on the parameter of SELECT PRESENTATION DIRECTIONS (SPD)

8.3.106 RIS — RESET TO INITIAL STATE

Notation: (Fs)
Representation: ESC 06/03

RIS causes a device to be reset to its initial state, i.e. the state it has after it is made operational. This may imply, if applicable: clear tabulation stops, remove qualified areas, reset graphic rendition, put all character positions into the erased state, move the active position to the first position of the first line, set the modes into the reset state, etc.

8.3.107 RM — RESET MODE

Notation: (Ps...)
Representation: CSI Ps... 06/12
No parameter default value.

RM causes the modes of the receiving device to be reset as specified by the parameter values:

1 GUARDED AREA TRANSFER MODE (GATM)

2 KEYBOARD ACTION MODE (KAM)

3 CONTROL REPRESENTATION MODE (CRM)

4 INSERTION REPLACEMENT MODE (IRM)

5 STATUS REPORT TRANSFER MODE (SRTM)

6 ERASURE MODE (ERM)

7 LINE EDITING MODE (VEM)

8 (reserved for future standardization)

9 (reserved for future standardization)

10 CHARACTER EDITING MODE (HEM)

11 POSITIONING UNIT MODE (PUM)

12 SEND/RECEIVE MODE (SRM)

13 FORMAT EFFECTOR ACTION MODE (FEAM)

14 FORMAT EFFECTOR TRANSFER MODE (FETM)

15 MULTIPLE AREA TRANSFER MODE (MATM)

16 TRANSFER TERMINATION MODE (TTM)

17 SELECTED AREA TRANSFER MODE (SATM)

18 TABULATION STOP MODE (TSM)

19 EDITING BOUNDARY MODE (EBM)
see sub-clause E.2.1 of annex E

20 LINE FEED/NEW LINE MODE (LF/NLM)
see sub-clause E.2.2 of annex E

21 GRAPHIC RENDITION COMBINATION MODE (GRCM)

22 ZERO DEFAULT MODE (ZDM)

NOTE — Private modes may be implemented using private parameters, see 5.5.1 and 7.4.

8.3.108 SACS — SET ADDITIONAL CHARACTER SEPARATION

Notation: (Pn)

Representation: CSI Pn 02/00 05/12
Parameter default value: Pn = 0

SACS is used to establish extra inter-character escapement for subsequent text. The established extra escapement remains in effect until the next occurrence of SACS or of SET REDUCED CHARACTER SEPARATION (SRCS) in the data stream or until it is reset to the default value by a subsequent occurrence of CARRIAGE RETURN/LINE FEED (CR LF) or of NEXT LINE (NEL) in the data stream, see annex C.

Pn specifies the number of units by which the inter-character escapement is enlarged.

The unit in which the parameter value is expressed is that established by SELECT SIZE UNIT (SSU).

8.3.109 SAPV — SELECT ALTERNATIVE PRESENTATION VARIANTS

Notation: (Ps...)
Representation: CSI Ps... 02/00 05/13
Parameter default value: Ps = 0

SAPV is used to specify one or more variants for the presentation of subsequent text. The parameter values are

0 default presentation (implementation-defined); cancels the effect of any preceding occurrence of SAPV in the data stream

1 the decimal digits are presented by means of the graphic symbols used in Latin script

2 the decimal digits are presented by means of the graphic symbols used in Arabic script, i.e. the Hindi symbols

3 each of the graphic characters in the graphic character set(s) in use which is one of a left/right handed pair (parentheses, square brackets, curly brackets, greater-than/less-than signs, etc.) is presented as "mirrored", i.e. as the other member of the pair. For example, the coded graphic character given the name LEFT PARENTHESIS is presented as RIGHT PARENTHESIS, and vice versa

4 all graphic characters which represent operators and delimiters in mathematical formulae and which are not symmetrical about a vertical axis are presented as mirrored about that vertical axis

5 the following graphic character is presented in its isolated form

6 the following graphic character is presented in its initial form

7 the following graphic character is presented in its medial form

8 the following graphic character is presented in its final form

9 where the bit combination 02/14 is intended to represent a decimal mark in a decimal number it shall be presented by means of the graphic symbol FULL STOP

10 where the bit combination 02/14 is intended to represent a decimal mark in a decimal number it shall be presented by means of the graphic symbol COMMA

11 vowels are presented above or below the preceding character

12 vowels are presented after the preceding character

13 contextual shape determination of Arabic scripts, including the LAM-ALEPH ligature but excluding all other Arabic ligatures

14 contextual shape determination of Arabic scripts, excluding all Arabic ligatures

15 cancels the effect of parameter values 3 and 4

16 vowels are not presented

8.3.110 SCI — SINGLE CHARACTER INTRODUCER

Notation: (C1)
Representation: 09/10 or ESC 05/10

SCI and the bit combination following it are used to represent a control function or a graphic character. The bit combination following SCI must be from 00/08 to 00/13 or 02/00 to 07/14. The use of SCI is reserved for future standardization

8.3.111 SCO — SELECT CHARACTER ORIENTATION

Notation: (Ps)
Representation: CSI Ps 02/00 06/05
Parameter default value: Ps = 0

SCO is used to establish the amount of rotation of the graphic characters following in the data stream. The established value remains in effect until the next occurrence of SCO in the data stream.

The parameter values are

0 0°
1 45°
2 90°
3 135°
4 180°
5 225°
6 270°
7 315°

Rotation is positive, i.e. counter-clockwise and applies to the normal presentation of the graphic characters along the character path. The centre of rotation of the affected graphic characters is not defined by this International Standard.

The direction of the character path depends on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.112 SCS — SET CHARACTER SPACING

Notation: (Pn)
Representation: CSI Pn 02/00 06/07
No parameter default value.

SCS is used to establish the character spacing for subsequent text. The established spacing remains in effect until the next occurrence of SELECT CHARACTER SPACING (SHS) or of SPACING INCREMENT (SPI) or of SCS in the data stream, see annex C.

Pn specifies the character spacing.

The unit in which the parameter value is expressed is that established by SELECT SIZE UNIT (SSU).

8.3.113 SD — SCROLL DOWN

Notation: (Pn)
Representation: CSI Pn 05/14
Parameter default value: Pn = 1

SD causes the displayed data to be moved by *n* lines if the character path is horizontal, or by *n* character positions if the character path is vertical, such that the data appear to move down; where *n* equals the value of Pn.

The active position is not affected by this control function.

Whether the character path is horizontal or vertical depends on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.114 SEE — SELECT EDITING EXTENT

Notation: (Ps)
Representation: CSI Ps 05/01
Parameter default value: Ps = 0

SEE is used to establish the editing extent for subsequent character insertion or deletion. The established extent remains in effect until the next occurrence of SEE in the data stream. The editing extent depends on the parameter value:

0 the shifted part is limited to the active page
1 the shifted part is limited to the active line
2 the shifted part is limited to the active field
3 the shifted part is limited to the active qualified area
4 the shifted part consists of the relevant part of the entire buffer

8.3.115 SEF — SHEET EJECT AND FEED

Notation: (Ps)
Representation: CSI Ps 02/00 05/09
Parameter default value: Ps = 0

SEF causes a sheet of paper to be ejected from a printing device, and, for non-zero parameter values causes another sheet to be loaded into the printing device from the paper bin specified by the parameter value:

0 eject sheet
1 eject sheet and load another from bin 1
2 eject sheet and load another from bin 2
.
.
.
9 eject sheet and load another from bin 9

8.3.116 SGR — SELECT GRAPHIC RENDITION

Notation: (Ps...)
Representation: CSI Ps... 06/13
Parameter default value: Ps = 0

SGR is used to establish one or more graphic rendition aspects for subsequent text. The established aspects remain in effect until the next occurrence of SGR in the data stream, depending on the setting of the GRAPHIC RENDITION COMBINATION MODE (GRCM). Each graphic rendition aspect is specified by a parameter value:

0 default rendition (implementation-defined), cancels the effect of any preceding occurrence of SGR in the data stream regardless of the setting of the GRAPHIC RENDITION COMBINATION MODE (GRCM)
1 bold or increased intensity
2 faint, decreased intensity or second colour
3 italicized
4 underlined
5 slowly blinking (less then 150 per minute)
6 rapidly blinking (150 per minute or more)
7 negative image
8 concealed characters
9 crossed-out (characters still legible but marked as to be deleted)
10 primary (default) font
11 first alternative font
12 second alternative font
13 third alternative font
14 fourth alternative font
15 fifth alternative font
16 sixth alternative font
17 seventh alternative font
18 eighth alternative font
19 ninth alternative font
20 fraktur (Gothic)
21 doubly underlined
22 normal colour or normal intensity (neither bold nor faint)
23 not italicized, not fraktur
24 not underlined (neither singly nor doubly)
25 steady (not blinking)

26 (reserved for proportional spacing as specified in CCITT Recommendation T.61 1984)

27 positive image

28 revealed characters

29 not crossed out

30 black display

31 red display

32 green display

33 yellow display

34 blue display

35 magenta display

36 cyan display

37 white display

38 (reserved for future standardization)

39 default display colour (implementation-defined)

40 black background

41 red background

42 green background

43 yellow background

44 blue background

45 magenta background

46 cyan background

47 white background

48 (reserved for future standardization)

49 default background colour (implementation-defined)

50 (reserved for cancelling the effect of the rendering aspect established by parameter 26)

51 framed

52 encircled

53 overlined

54 not framed, not encircled

55 not overlined

56 (reserved for future standardization)

57 (reserved for future standardization)

58 (reserved for future standardization)

59 (reserved for future standardization)

60 ideogram underline or right side line

61 ideogram double underline or double right side line

62 ideogram overline or left side line

63 ideogram double overline or double left side line

64 ideogram stress marking

65 cancels the effect of the rendition aspects established by parameters 60 to 64

NOTE — The usable combinations of parameter values are implementation-defined.

8.3.117 SHS — SELECT CHARACTER SPACING

Notation: (Ps)
Representation: CSI Ps 02/00 04/11
Parameter default value: Ps = 0

SHS is used to establish the character spacing for subsequent text. The established spacing remains in effect until the next occurrence of SET CHARACTER SPACING (SCS) or of SPACING INCREMENT (SPI) or of SHS in the data stream. The parameter values are

0 10 characters per 25,4 mm

1 12 characters per 25,4 mm

2 15 characters per 25,4 mm

3 6 characters per 25,4 mm

4 3 characters per 25,4 mm

5 9 characters per 50,8 mm

6 4 characters per 25,4 mm

8.3.118 SI — SHIFT-IN

Notation: (C0)
Representation: 00/15

SI is used for code extension purposes. It causes the meanings of the bit combinations following it in the data stream to be changed.

The use of SI is defined in ISO 2022.

NOTE — SI is used in 7-bit environments only; in 8-bit environments LOCKING-SHIFT ZERO (LS0) is used instead.

8.3.119 SL — SCROLL LEFT

Notation: (Pn)
Representation: CSI Pn 02/00 04/00
Parameter default value: Pn = 1

SL causes the displayed data to be moved by *n* character positions if the character path is horizontal, or by *n* lines if the character path is vertical, such that the data appear to move to the left; where *n* equals the value of Pn.

The active position is not affected by this control function.

Whether the character path is horizontal or vertical depends on the parameter of SELECT PRESENTATION DIRECTIONS (SPD).

8.3.120 SLH — SET LINE HOME

Notation: (Pn)
Representation: CSI Pn 02/00 05/05
No parameter default value.

SLH is used to establish at position *n* within the active line and lines of subsequent text the position to which the active position will be moved by subsequent occurrences of CARRIAGE RETURN (CR), DELETE LINE (DL), INSERT LINE (IL) or NEXT LINE (NEL) in the data stream; where *n* equals the value of Pn.