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**Information technology — Control
functions for coded character sets**

iTeh *Technologies de l'information — Fonctions de commande pour les jeux
de caractères codés* **STANDARD PREVIEW**
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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

International Standard ISO/IEC 6429 was prepared by the European Computer Manufacturers Association (as Standard ECMA-48) and was adopted, under a special "fast-track procedure" by Joint Technical Committee ISO/IEC JTC1, *Information technology*, in parallel with its approval by national bodies of ISO and IEC.

This third edition cancels and replaces the second edition (ISO 6429:1988), which has been technically revised.

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

Introduction

This International Standard constitutes a repertoire of a large number of control functions the definitions and coded representations of which are thus standardized. For each application the required selection of control functions can be made from this repertoire.

This third edition of ISO/IEC 6429 contains the control functions already standardized in the second edition and, in addition, new control functions needed for handling bi-directional texts, i.e. texts comprising parts written with a left-to-right script and parts written with a right-to-left script. ECMA Technical Report TR/53 gives further information and examples of handling such texts. The inclusion of these specialized control functions has required a corresponding adjustment of the definitions of some of the other control functions. Moreover, the concept of "device" had to be revised.

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Information technology – Control functions for coded character sets

1 Scope

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 International Standard ISO 2022.

This International Standard specifies technical means to handle bi-directional texts in character-imaging devices in the case of

- texts in a single script of which specific parts need to be presented in an opposite direction (for example, numbers in Arabic or Hebrew text);
- texts in different scripts presented in opposite directions (like texts in Latin and Arabic or texts in Latin and Hebrew);
- texts like the above with a horizontal line orientation and a top-to-bottom line progression.

The control functions defined in this International Standard are intended to be used embedded in character-coded data for interchange, in particular with character-imaging devices.

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 architecture of such a device. 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 standards specifying control functions may define more restricted definitions of them than those in this International Standard.

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 in 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.

The facilities selected for a particular application may be registered according to ISO 2375 for ease of reference in information interchange.

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.

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 5.4, 5.4.1 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. 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:

- i) identifies, by reference to the clauses of, or to the control functions specified in this International Standard, the selection of control functions, the coded representations of which the device can originate or can receive and interpret;
- ii) identifies the means by which the user may supply the corresponding control functions, or may recognize them, as specified respectively in 2.3.2 and 2.3.3 below.

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, and of their parameter values (including mode selection parameters), 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 over the coding interface.

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, and of their parameter values (including mode selection parameters), conforming to this International Standard.

If the identified selection contains a control sequence for which a default value for a parameter is specified in this International Standard, the identified selection shall include the default value both in explicit and in 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 over the coding interface, in such a form that the user can recognize it from among the control functions within 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 edition indicated was 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 edition 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 8613-6:1989, *Information processing - Text and office systems - Office Document Architecture (ODA) and interchange format - Part 6: Character content architectures.*

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.

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 purpose of this International Standard, the following definitions apply.

4.2.1 Active area: The area in the data component which contains the active data position.

The area in the presentation component which contains the active presentation position.

4.2.2 Active field: The field in the data component which contains the active data position.

The field in the presentation component which contains the active presentation position.

4.2.3 Active line: The line in the data component which contains the active data position. The line in the presentation component which contains the active presentation position.

4.2.4 Active page: The page in the data component which contains the active data position. The page in the presentation component which contains the active presentation position.

4.2.5 Active position: The character position which is to image the graphic symbol representing the next graphic character or relative to which the next control function is to be executed.

NOTE - In general, the active position is indicated in a display by a cursor.

Active data position

In the data component the character position which is to receive the next graphic character or the next control function from the data stream and relative to which certain control functions are to be executed.

Active presentation position

In the presentation component the character position which is to receive the next graphic character for graphic image output and relative to which certain control functions are to be executed.

NOTE - In general, the active presentation position is indicated in a display 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 Bi-directional data: Data containing text strings which are to be presented in different writing directions, like left-to-right and right-to-left.

4.2.9 Bit combination: An ordered set of bits used for the representation of characters.

4.2.10 Byte: A bit string that is operated upon as a unit.

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

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

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 sequential order of the character positions along a line of the presentation component.

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

In the data component a position available for receiving a graphic character for further presentation processing.

In the presentation component a position available for receiving a graphic character for the rendering of the graphic image output.

4.2.16 Character progression: The sequential order of the character positions along a line of the data component.

4.2.17 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.

4.2.18 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.

4.2.19 Coded-character-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.

NOTE 1

In a communication environment according to the reference model for Open Systems Interconnection of ISO 7498, a CC-data-element will form all or part of the information that corresponds to the Presentation-Protocol-Data-Units (PPDU) defined in that International Standard.

NOTE 2

When information interchange is accomplished by means of interchangeable media, a CC-data-element will form all or part of the information that corresponds to the user data, and not that recorded during formatting and initialization.

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

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

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

4.2.23 Control function: An action that affects the recording, processing, transmission, or interpretation of data, and that has a coded representation consisting of one or more bit combinations.

4.2.24 Control sequence: A string of bit combinations starting with the control function CONTROL SEQUENCE INTRODUCER (CSI), and used for the coded representation of control functions with or without parameters.

4.2.25 Control string: A string of bit combinations which may occur in the data stream as a logical entity for control purposes.

4.2.26 Cursor: A special indicator used in a display to mark the active presentation position.

4.2.27 Data component: The device component which is used for storing the received data for further presentation processing.

4.2.28 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.

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

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

4.2.31 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.

4.2.32 Device: A component of information processing equipment which can transmit, and/or receive, coded information within CC-data-elements.

NOTE - It may be an input/output device in the conventional sense, or a process such as an application program or gateway function.

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

4.2.34 Editor function: A control function used for editing, altering or transposing the visual arrangement of data.

- 4.2.35 Eligible:** The term used to denote an area considered for transmission or transfer.
- 4.2.36 Environment:** The characteristic that identifies the number of bits used for representing a character in a data processing or data communication system or in a part of such a system.
- 4.2.37 To erase:** To remove the contents from character positions and leaving the resulting gap open.
- 4.2.38 Escape sequence:** A string of bit combinations that is used for control purposes in code extension procedures. The first of these bit combinations represents the control function ESCAPE.
- 4.2.39 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).
- 4.2.40 Final Byte:** The bit combination that terminates an escape sequence or a control sequence.
- 4.2.41 Formator function:** A control function (format effector or presentation control function) describing how the originator of the data stream wishes the information to be formatted or presented.
- 4.2.42 Graphic character:** A character, other than a control function, that has a visual representation normally hand-written, printed or displayed, and that has a coded representation consisting of one or more bit combinations.
- 4.2.43 Graphic rendition:** The visual style of displaying a set of graphic symbols.
- 4.2.44 Graphic symbol:** A visual representation of a graphic character or of a control function.
- 4.2.45 Guarded area:** A special case of a qualified area, the contents of which may be excluded from transmission as a data stream and from transfer to an auxiliary input/output device.
- 4.2.46 Initial state:** The state a device has after it is made operational. It is the recommended "reset" state of the modes.
- 4.2.47 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.
- 4.2.48 To invoke:** To cause a designated set of characters to be represented by the prescribed bit combinations whenever those bit combinations occur.
- 4.2.49 Line:** A set of a consecutive character positions.
- 4.2.50 Line home position:** A reference position on a line in the data component ahead of which the active data position can normally not be moved.
A reference position on a line in the presentation component ahead of which the active presentation position can normally not be moved.
- 4.2.51 Line limit position:** A reference position on a line in the data component beyond which the active data position can normally not be moved.
A reference position on a line in the presentation component beyond which the active presentation position can normally not be moved.
- 4.2.52 Line orientation:** The term used to describe the way in which a line will appear in the graphic image output. In this International Standard, line orientation may only be vertical or horizontal.
- 4.2.53 Line progression:** The direction of presentation of successive lines.
- 4.2.54 Operating system:** The software that controls the execution of computer programs and that may provide scheduling, debugging, input/output control, accounting, compilation, storage assignment, data management, and related services.
- 4.2.55 Page:** A set of consecutive lines.
- 4.2.56 Page home position:** A reference position on a page in the data component ahead of which the active line (the line that contains the active data position) can normally not be moved.
A reference position on a page in the presentation component ahead of which the active line (the line that contains the active presentation position) can normally not be moved.