INTERNATIONAL STANDARD

ISO/IEC 6429

Third edition
1992-12-15

Information technology — Control functions for coded character sets

Technologies de l'information — Fonctions de commande pour les jeux de caractères codés

Reference number
ISO/IEC 6429:1992(E)

Contents

		Page
1	Scope	1
2	Conformance	1
2.1	Types of conformance	1
2.2	Conformance of information interchange	1
2.3	Conformance of devices	2
2.3.1	Device description	2
2.3.2	Originating devices	2
2.3.3	Receiving devices	2
3	Normative references	2
4	Notation and definitions	3
4.1	Notation	3
4.2	Definitions	3
5	Coded representation	6
5.1	General	6
5.2	Elements of the C0 set	6
5.3	Elements of the C1 set	7
5.4	Control sequences	8
5.4.1	Parameter representation	10
5.4.2	Parameter string format	10
5.4.3	Types of parameters	11
5.5	Independent control functions	11
5.6	Control strings	12

© ISO/IEC 1992
All rights reserved. No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

ISO/IEC Copyright Office • Case Postale 56 • CH-1211 Genève 20 • Switzerland
Printed in Switzerland

6	Device concepts	**12**
6.1	Components	**12**
6.1.1	Presentation component	**13**
6.1.2	The active presentation position	**13**
6.1.3	Data component	**13**
6.1.4	The active data position	**14**
6.1.5	Relationship between active data position and active presentation position	**14**
6.1.6	Implicit movement	**14**
6.1.7	Explicit movement	**15**
6.1.8	Indirect movement	**15**
6.2	The data stream	**16**
6.2.1	Data organization	**16**
6.3	The graphic image output	**16**
6.4	Formator functions and editor functions	**16**
6.4.1	Formator functions	**16**
6.4.2	Composite graphic characters	**17**
6.4.3	Editor functions	**17**
6.5	Selected and qualified areas	**17**
6.5.1	Selected areas	**17**
6.5.2	Qualified areas	**17**
6.6	Auxiliary input/output devices	**18**
6.7	Tabulation and fields	**18**
7	Modes	**18**
7.1	The concept of modes	**18**
7.2	Definition of modes	**19**
7.2.1	BDSM - BI-DIRECTIONAL SUPPORT MODE	**21**
7.2.2	CRM - CONTROL REPRESENTATION MODE	**21**
7.2.3	DCSM - DEVICE COMPONENT SELECT MODE	**21**
7.2.4	ERM - ERASURE MODE	**21**
7.2.5	FEAM - FORMAT EFFECTOR ACTION MODE	**21**
7.2.6	FETM - FORMAT EFFECTOR TRANSFER MODE	**22**
7.2.7	GATM - GUARDED AREA TRANSFER MODE	**22**
7.2.8	GRCM - GRAPHIC RENDITION COMBINATION MODE	**22**
7.2.9	HEM - CHARACTER EDITING MODE	**22**
7.2.10	IRM - INSERTION REPLACEMENT MODE	**23**
7.2.11	KAM - KEYBOARD ACTION MODE	**23**
7.2.12	MATM - MULTIPLE AREA TRANSFER MODE	**23**
7.2.13	PUM - POSITIONING UNIT MODE	**23**
7.2.14	SATM - SELECTED AREA TRANSFER MODE	**23**
7.2.15	SRM - SEND/RECEIVE MODE	**23**

7.2.16 SRTM - STATUS REPORT TRANSFER MODE 23
7.2.17 TSM - TABULATION STOP MODE 24
7.2.18 TTM - TRANSFER TERMINATION MODE 24
7.2.19 VEM - LINE EDITING MODE 24
7.2.20 ZDM - ZERO DEFAULT MODE 24

7.3 Interaction between modes 24

7.3.1 GUARDED AREA TRANSFER MODE (GATM), MULTIPLE AREA TRANSFER MODE (MATM), SELECTED AREA TRANSFER MODE (SATM), and TRANSFER TERMINATION MODE (TTM) 25
7.3.2 CONTROL REPRESENTATION MODE (CRM) and FORMAT EFFECTOR ACTION MODE (FEAM) 25
7.3.3 CHARACTER EDITING MODE (HEM) and INSERTION REPLACEMENT MODE (IRM) 25
7.3.4 BI-DIRECTIONAL SUPPORT MODE (BDSM) and DEVICE COMPONENT SELECT MODE (DCSM) 26

7.4 Private modes 26

8 Control functions 26

8.1 Types of control functions 26
8.2 Categories of control functions 27

8.2.1 Delimiters 27
8.2.2 Introducers 27
8.2.3 Shift functions 27
8.2.4 Format effectors 27
8.2.5 Presentation control functions 28
8.2.6 Editor functions 29
8.2.7 Cursor control functions 30
8.2.8 Display control functions 30
8.2.9 Device control functions 30
8.2.10 Information separators 30
8.2.11 Area definition 31
8.2.12 Mode setting 31
8.2.13 Transmission control functions 31
8.2.14 Miscellaneous control functions 31

8.3 Definition of control functions 32

8.3.1 ACK - ACKNOWLEDGE 32
8.3.2 APC - APPLICATION PROGRAM COMMAND 32
8.3.3 BEL - BELL 33
8.3.4 BPH - BREAK PERMITTED HERE 33
8.3.5 BS - BACKSPACE 33
8.3.6 CAN - CANCEL 33
8.3.7 CBT - CURSOR BACKWARD TABULATION 33
8.3.8 CCH - CANCEL CHARACTER 33
8.3.9 CHA - CURSOR CHARACTER ABSOLUTE 34
8.3.10 CHT - CURSOR FORWARD TABULATION 34
8.3.11 CMD - CODING METHOD DELIMITER 34
8.3.12 CNL - CURSOR NEXT LINE 34
8.3.13 CPL - CURSOR PRECEDING LINE 34
8.3.14 CPR - ACTIVE POSITION REPORT 34
8.3.15 CR - CARRIAGE RETURN 35
8.3.16 CSI - CONTROL SEQUENCE INTRODUCER 35
8.3.17 CTC - CURSOR TABULATION CONTROL 35

8.3.18 CUB - CURSOR LEFT 36
8.3.19 CUD - CURSOR DOWN 36
8.3.20 CUF - CURSOR RIGHT 36
8.3.21 CUP - CURSOR POSITION 36
8.3.22 CUU - CURSOR UP 36
8.3.23 CVT - CURSOR LINE TABULATION 36
8.3.24 DA - DEVICE ATTRIBUTES 37
8.3.25 DAQ - DEFINE AREA QUALIFICATION 37
8.3.26 DCH - DELETE CHARACTER 37
8.3.27 DCS - DEVICE CONTROL STRING 38
8.3.28 DC1 - DEVICE CONTROL ONE 38
8.3.29 DC2 - DEVICE CONTROL TWO 38
8.3.30 DC3 - DEVICE CONTROL THREE 38
8.3.31 DC4 - DEVICE CONTROL FOUR 39
8.3.32 DEL - DELETE 39
8.3.33 DL - DELETE LINE 39
8.3.34 DLE - DATA LINK ESCAPE 39
8.3.35 DMI - DISABLE MANUAL INPUT 39
8.3.36 DSR - DEVICE STATUS REPORT 40
8.3.37 DTA - DIMENSION TEXT AREA 40
8.3.38 EA - ERASE IN AREA 40
8.3.39 ECH - ERASE CHARACTER 41
8.3.40 ED - ERASE IN PAGE 41
8.3.41 EF - ERASE IN FIELD 42
8.3.42 EL - ERASE IN LINE 42
8.3.43 EM - END OF MEDIUM 43
8.3.44 EMI - ENABLE MANUAL INPUT 43
8.3.45 ENQ - ENQUIRY 43
8.3.46 EOT - END OF TRANSMISSION 43
8.3.47 EPA - END OF GUARDED AREA 43
8.3.48 ESA - END OF SELECTED AREA 43
8.3.49 ESC - ESCAPE 44
8.3.50 ETB - END OF TRANSMISSION BLOCK 44
8.3.51 ETX - END OF TEXT 44
8.3.52 FF - FORM FEED 44
8.3.53 FNK - FUNCTION KEY 44
8.3.54 FNT - FONT SELECTION 44
8.3.55 GCC - GRAPHIC CHARACTER COMBINATION 45
8.3.56 GSM - GRAPHIC SIZE MODIFICATION 45
8.3.57 GSS - GRAPHIC SIZE SELECTION 45
8.3.58 HPA - CHARACTER POSITION ABSOLUTE 45
8.3.59 HPB - CHARACTER POSITION BACKWARD 46
8.3.60 HPR - CHARACTER POSITION FORWARD 46
8.3.61 HT - CHARACTER TABULATION 46
8.3.62 HTJ - CHARACTER TABULATION WITH JUSTIFICATION 46
8.3.63 HTS - CHARACTER TABULATION SET 46
8.3.64 HVP - CHARACTER AND LINE POSITION 46
8.3.65 ICH - INSERT CHARACTER 47
8.3.66 IDCS - IDENTIFY DEVICE CONTROL STRING 47
8.3.67 IGS - IDENTIFY GRAPHIC SUBREPERTOIRE 47
8.3.68 IL - INSERT LINE 48
8.3.69 INT - INTERRUPT 48
8.3.70 IS1 - INFORMATION SEPARATOR ONE (US - UNIT SEPARATOR) 48
8.3.71 IS2 - INFORMATION SEPARATOR TWO (RS - RECORD SEPARATOR) 48
8.3.72 IS3 - INFORMATION SEPARATOR THREE (GS - GROUP SEPARATOR) 48

8.3.73 IS4 - INFORMATION SEPARATOR FOUR (FS - FILE SEPARATOR) **49**
8.3.74 JFY - JUSTIFY **49**
8.3.75 LF - LINE FEED **49**
8.3.76 LS0 - LOCKING-SHIFT ZERO **49**
8.3.77 LS1 - LOCKING-SHIFT ONE **50**
8.3.78 LS1R - LOCKING-SHIFT ONE RIGHT **50**
8.3.79 LS2 - LOCKING-SHIFT TWO **50**
8.3.80 LS2R - LOCKING-SHIFT TWO RIGHT **50**
8.3.81 LS3 - LOCKING-SHIFT THREE **50**
8.3.82 LS3R - LOCKING-SHIFT THREE RIGHT **50**
8.3.83 MC - MEDIA COPY **51**
8.3.84 MW - MESSAGE WAITING **51**
8.3.85 NAK - NEGATIVE ACKNOWLEDGE **51**
8.3.86 NBH - NO BREAK HERE **51**
8.3.87 NEL - NEXT LINE **51**
8.3.88 NP - NEXT PAGE **52**
8.3.89 NUL - NULL **52**
8.3.90 OSC - OPERATING SYSTEM COMMAND **52**
8.3.91 PEC - PRESENTATION EXPAND OR CONTRACT **52**
8.3.92 PFS - PAGE FORMAT SELECTION **53**
8.3.93 PLD - PARTIAL LINE FORWARD **53**
8.3.94 PLU - PARTIAL LINE BACKWARD **53**
8.3.95 PM - PRIVACY MESSAGE **54**
8.3.96 PP - PRECEDING PAGE **54**
8.3.97 PPA - PAGE POSITION ABSOLUTE **54**
8.3.98 PPB - PAGE POSITION BACKWARD **54**
8.3.99 PPR - PAGE POSITION FORWARD **54**
8.3.100 PTX - PARALLEL TEXTS **54**
8.3.101 PU1 - PRIVATE USE ONE **55**
8.3.102 PU2 - PRIVATE USE TWO **55**
8.3.103 QUAD - QUAD **55**
8.3.104 REP - REPEAT **56**
8.3.105 RI - REVERSE LINE FEED **56**
8.3.106 RIS - RESET TO INITIAL STATE **56**
8.3.107 RM - RESET MODE **56**
8.3.108 SACS - SET ADDITIONAL CHARACTER SEPARATION **57**
8.3.109 SAPV - SELECT ALTERNATIVE PRESENTATION VARIANTS **57**
8.3.110 SCI - SINGLE CHARACTER INTRODUCER **58**
8.3.111 SCO - SELECT CHARACTER ORIENTATION **58**
8.3.112 SCP - SELECT CHARACTER PATH **59**
8.3.113 SCS - SET CHARACTER SPACING **59**
8.3.114 SD - SCROLL DOWN **60**
8.3.115 SDS - START DIRECTED STRING **60**
8.3.116 SEE - SELECT EDITING EXTENT **60**
8.3.117 SEF - SHEET EJECT AND FEED **61**
8.3.118 SGR - SELECT GRAPHIC RENDITION **61**
8.3.119 SHS - SELECT CHARACTER SPACING **63**
8.3.120 SI - SHIFT-IN **63**
8.3.121 SIMD - SELECT IMPLICIT MOVEMENT DIRECTION **63**
8.3.122 SL - SCROLL LEFT **63**
8.3.123 SLH - SET LINE HOME **64**
8.3.124 SLL - SET LINE LIMIT **64**
8.3.125 SLS - SET LINE SPACING **64**
8.3.126 SM - SET MODE **65**
8.3.127 SO - SHIFT-OUT **65**

8.3.128 SOH - START OF HEADING 65
8.3.129 SOS - START OF STRING 66
8.3.130 SPA - START OF GUARDED AREA 66
8.3.131 SPD - SELECT PRESENTATION DIRECTIONS 66
8.3.132 SPH - SET PAGE HOME 67
8.3.133 SPI - SPACING INCREMENT 67
8.3.134 SPL - SET PAGE LIMIT 68
8.3.135 SPQR - SELECT PRINT QUALITY AND RAPIDITY 68
8.3.136 SR - SCROLL RIGHT 68
8.3.137 SRCS - SET REDUCED CHARACTER SEPARATION 68
8.3.138 SRS - START REVERSED STRING 69
8.3.139 SSA - START OF SELECTED AREA 69
8.3.140 SSU - SELECT SIZE UNIT 69
8.3.141 SSW - SET SPACE WIDTH 70
8.3.142 SS2 - SINGLE-SHIFT TWO 70
8.3.143 SS3 - SINGLE-SHIFT THREE 70
8.3.144 ST - STRING TERMINATOR 70
8.3.145 STAB - SELECTIVE TABULATION 71
8.3.146 STS - SET TRANSMIT STATE 71
8.3.147 STX - START OF TEXT 71
8.3.148 SU - SCROLL UP 71
8.3.149 SUB - SUBSTITUTE 71
8.3.150 SVS - SELECT LINE SPACING 71
8.3.151 SYN - SYNCHRONOUS IDLE 72
8.3.152 TAC - TABULATION ALIGNED CENTRED 72
8.3.153 TALE - TABULATION ALIGNED LEADING EDGE 72
8.3.154 TATE - TABULATION ALIGNED TRAILING EDGE 72
8.3.155 TBC - TABULATION CLEAR 73
8.3.156 TCC - TABULATION CENTRED ON CHARACTER 73
8.3.157 TSR - TABULATION STOP REMOVE 73
8.3.158 TSS - THIN SPACE SPECIFICATION 74
8.3.159 VPA - LINE POSITION ABSOLUTE 74
8.3.160 VPB - LINE POSITION BACKWARD 74
8.3.161 VPR - LINE POSITION FORWARD 74
8.3.162 VT - LINE TABULATION 74
8.3.163 VTS - LINE TABULATION SET 75

Annexes

A - Formator functions and editor functions 77

B - Coding examples 79

C - Text composition considerations 81

D - Implementation-dependent features 82

E - Text area formats 83

F - Differences between the third and the second edition of ISO/IEC 6429 85

G - Bibliography 88

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.

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.*