

## Ascii control codes (control characters, C0 controls)

The following document lists the [control codes](#) (control characters) in [Ascii](#) and in newer character code standards like Unicode, which generally try to be compatible with Ascii in the Ascii code range (positions 0 through 127).

	code pos.		Unicode		Description in <i>C0 of ISO 646</i>
	dec.	hex .	abbr .	name	
	0	0	NUL	NULL	A control character used to accomplish media-fill or time-fill. Null characters may be inserted into or removed from a stream of data without affecting the information content of that stream. But then the addition or removal of these characters may affect the information layout and/or the control of equipment.
ctl-A	1	1	STX	START OF HEADING	A transmission control character used as the first character of a heading of an information message.
ctl-B	2	2	SOT	START OF TEXT	A transmission control character which precedes a text and which is used to terminate a heading.
ctl-C	3	3	ETX	END OF TEXT	A transmission control character which terminates a text.
ctl-D	4	4	EOT	END OF TRANSMISSION	A transmission control character used to indicate the conclusion of the transmission of one or more texts..
ctl-E	5	5	ENQ	ENQUIRY	A transmission control character used as a request for a response from a remote station; the response may include station identification and/or station status. When a "Who are you" function is required on the general switched transmission network, the first use of ENQ after the connection is established shall have the meaning "Who are you" (station identification). Subsequent use of ENQ may, or may not, include the function "Who are you", as determined by agreement.
ctl-F	6	6	ACK	ACKNOWLEDGE	A transmission control character transmitted by a receiver as an affirmative response to the sender.
ctl-G	7	7	BEL	BELL	A control character that is used when there is a need to call for attention; it may control alarm or attention devices.
ctl-H	8	8	BS	BACKSPACE	A format effector which moves the active position one character position backwards on the same line.
ctl-I	9	9	HT	HORIZONTAL TABULATION	A format effector which advances the active position to the next pre-determined character position on the same line.
ctl-J	10	A	LF	LINE FEED	A format effector which advances the active position to the same character position of the next line.
ctl-K	11	B	VT	VERTICAL TABULATION	A format effector which advances the active position to the same character position on the next pre-determined line.
ctl-L	12	C	FF	FORM FEED	A format effector which advances the active position to the same character position on a pre-determined line of the next form or page.
ctl-M	13	D	CR	CARRIAGE RETURN	A format effector which moves the active position to the first character position on the same line.

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ctl-N	14	E	SO	SHIFT OUT	A control character which is used in conjunction with SHIFT IN and ESCAPE to extend the graphic character set of the code. It may alter the meaning of octets 33 - 126 (dec.). The effect of this character when using code extension techniques is described in International Standard ISO 2022.
ctl-O	15	F	SI	SHIFT IN	A control character which is used in conjunction with SHIFT OUT and ESCAPE to extend the graphic character set of the code. It may reinstate the standard meanings of the octets which follow it. The effect of this character when using code extension techniques is described in International Standard ISO 2022.
ctl-P	16	10	DLE	DATA LINK ESCAPE	A transmission control character which will change the meaning of a limited number of contiguously following characters. Its is used exclusively to provide supplementary data transmission control functions. Only graphic characters and transmission control characters can be used in DLE sequences.
ctl-Q	17	11	DC1	DEVICE CONTROL ONE	A device control character which 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 for any other device control function not provided by other DCs.
ctl-R	18	12	DC2	DEVICE CONTROL TWO	A device control character which 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 normal operation), or for any other device control function not provided by other DCs.
ctl-S	19	13	DC3	DEVICE CONTROL THREE	A device control character which 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.
ctl-T	20	14	DC4	DEVICE CONTROL FOUR	A device control character which 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.
ctl-U	21	15	NAK	NEGATIVE ACKNOWLEDGE	A transmission control character transmitted by a receiver as a negative response to the sender.
ctl-V	22	16	SYN	SYNCHRONOUS IDLE	A transmission control character used by a synchronous transmission system in the absence of any other character (idle condition) to provide a signal from which synchronism may be achieved or retained between data terminal equipment.
ctl-W	23	17	ETB	END OF TRANSMISSION BLOCK	A transmission control character used to indicate the end of a transmission block of data where data is divided into such blocks for transmission purposes.

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ctl-X	24	18	CAN	CANCEL	A character, or the first character of a sequence, indicating that the data preceding it is in error. As a result, this data is to be ignored. The specific meaning of this character must be defined for each application and/or between sender and recipient.
ctl-Y	25	19	EM	END OF MEDIUM	A control character that may be 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. The position of this character does not necessarily correspond to the physical end of the medium.
ctl-Z	26	1A	SUB	SUBSTITUTE	A control character used in the place of a character that has been found to be invalid or in error. SUB is intended to be introduced by automatic means.
ctl-[	27	1B	ESC	ESCAPE	A control character which is used to provide additional control functions. It alters the meaning of a limited number of contiguously following bit combinations. The use of this character is specified in International Standard ISO 2022.
ctl-\	28	1C	FS	FILE SEPARATOR	A control character used to separate and qualify data logically; its specific meaning has to be specified for each application. If this character is used in hierarchical order, it delimits a data item called a <i>file</i> .
ctl-]	29	1D	GS	GROUP SEPARATOR	A control character used to separate and qualify data logically; its specific meaning has to be specified for each application. If this character is used in hierarchical order, it delimits a data item called a <i>group</i> .
ctl-^	30	1E	RS	RECORD SEPARATOR	A control character used to separate and qualify data logically; its specific meaning has to be specified for each application. If this character is used in hierarchical order, it delimits a data item called a <i>record</i> .
ctl- _	31	1F	US	UNIT SEPARATOR	A control character used to separate and qualify data logically; its specific meaning has to be specified for each application. If this character is used in hierarchical order, it delimits a data item called a <i>unit</i> .
	127	7F	DEL	DELETE	(not defined)

Notes:

- The first column shows the widely used "control-something" name used for control codes. It relates to the fact that on a keyboard, it is often possible to generate a control code using the control (Ctrl, Ctl) key and a normal key.
- The column *C0 of ISO 646* quotes the definition in that document, with typos fixed, and with references to characters and code positions changed to use Unicode names and modern terms.

Historical table

The following table lists the original names of Ascii control codes as defined in 1963.

code pos.		Ascii 1963	
dec.	hex	abbr.	name
0	0	NULL	Null/Idle

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1	1	SOM	Start of message
2	2	EOA	End of address
3	3	EOM	End of message
4	4	EOT	End of transmission
5	5	WRU	"Who are you...?"
6	6	RU	"Are you...?"
7	7	BELL	Audible signal
8	8	FE <sub>0</sub>	Format effector
9	9	HT/SK	Horizontal tabulation/ Skip (punched card)
10	A	LF	Line feed
11	B	V <sub>TAB</sub>	Vertical tabulation
12	C	FF	Form feed
13	D	CR	Carriage return
14	E	SO	Shift out
15	F	SI	Shift in
16	10	DC <sub>0</sub>	Device control reserved for data link escape
17	11	DC <sub>1</sub>	Device control
18	12	DC <sub>2</sub>	
19	13	DC <sub>3</sub>	
20	14	DC <sub>4</sub> (STOP)	Device control (stop)
21	15	ERR	Error
22	16	SYNC	Synchronous idle
23	17	LEM	Logical end of media
24	18	S <sub>0</sub>	Separator (information)
25	19	S <sub>1</sub>	
26	1A	S <sub>2</sub>	
27	1B	S <sub>3</sub>	
28	1C	S <sub>4</sub>	
29	1D	S <sub>5</sub>	
30	1E	S <sub>6</sub>	
31	1F	S <sub>7</sub>	
127	7F	DEL	Delete/idle

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Ascii 1963 assigned code position 126 to the ESC code. Later [ESC](#) was moved to position 27, and position 126 was assigned to [tilde \(~\)](#). Similarly ACK was moved from 124 to 6, making room for [vertical line](#) (vertical bar, |).

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Note: The [space character](#) (blank, Ascii code position 32) is not discussed here. It can be classified and processed as a graphic character, or as a control character, or both, depending on context.

Sources:

- [\*American Standard Code for Information Interchange ASA standard X3.4-1963\*](#) ("Ascii 1963"); note that it allocated ACK to code position 124 and ESC to code position 126
- [\*C0 Set of ISO 646\*](#) in [\*International Register of Coded Character Sets To Be Used With Escape Sequences\*](#)
- [\*The Unicode Standard Version 3.0\*](#)