

Summary of Z-Machine Version Differences

Section numbers refer to the Z-Machine Standards Document 1.0. “Standard 1.0” and “Standard 1.1” refer to the revisions of the Standards Document.

Memory Limits

	V1	V2	V3	V4	V5	V6	V7	V8
Maximum story length (1.1.4)	128 KB	128 KB	128 KB	256 KB	256 KB	512 KB	512 KB*	512 KB
Address packing factor (1.2.3)	2	2	2	4	4	4, with offsets	4, with offsets	8
Number of properties (12.2)	31	31	31	63	63	63	63	63
Maximum number of objects (12.3.1, 12.3.2)	255	255	255	65535	65535	65535	65535	65535
Number of attributes (12.3.1, 12.3.2)	32	32	32	48	48	48	48	48
Maximum property length (12.4.1, 12.4.2)	8	8	8	64	64	64	64	64

Text Encoding

	V1	V2	V3	V4	V5	V6	V7	V8
Shift lock characters (3.2.2, 3.2.3, Standard 1.1)	Yes	Yes	-	-	-	-	-	-
Abbreviations (3.3)	-	32	96	96	96	96	96	96
Newline character (3.5.2, 3.5.3)	Character 1 in all alphabets	Character 7 in A2	Character 7 in A2	Character 7 in A2	Character 7 in A2	Character 7 in A2	Character 7 in A2	Character 7 in A2
Standard alphabet A2 (3.5.3, 3.5.4)	Includes “<”	Includes newline	Includes newline	Includes newline	Includes newline	Includes newline	Includes newline	Includes newline

* The maximum length for V7 is given as 320 KB in Standard 1.0, but corrected to 512 KB in 1.1.

	V1	V2	V3	V4	V5	V6	V7	V8
Custom alphabet table (3.5.5, 11.1)	-	-	-	-	Yes	Yes	Yes	Yes
Dictionary resolution (3.7, 13.3, 13.4)	6	6	6	9	9	9	9	9
Custom Unicode table (3.8.5.2, 11.1)	-	-	-	-	Yes	Yes	Yes	Yes
Dictionary words ending with truncated characters have no end bit (Standard 1.1)	Yes	Yes	-	-	-	-	-	-

I/O

	V1	V2	V3	V4	V5	V6	V7	V8
Undo (6.1.4)	-	-	-	-	Yes	Yes	Yes	Yes
Timed input (6.4, 10.5.3)	-	-	-	Yes	Yes	Yes	Yes	Yes
Sound effect interrupt (6.4)	-	-	-	-	Yes	Yes	Yes	Yes
Newline interrupt (6.4)	-	-	-	-	-	Yes	-	-
Player input copied to transcript (7.1.1.1)	Yes	Yes	Yes	Yes	Yes	-	Yes	Yes
Output streams 3 and 4 (7.1.2)	-	-	Yes	Yes	Yes	Yes	Yes	Yes
Buffer control (7.2.1)	-	-	-	Yes	Yes	Yes	Yes	Yes
Output stream 1 can be turned off (7.3, 7.4)	-	-	Yes	Yes	Yes	Yes	Yes	Yes
Load/save arbitrary files (7.6)	-	-	-	-	Yes	Yes	Yes	Yes
Sound effects (9.1)	-	-	Yes	Yes	Yes	Yes	Yes	Yes
Sound effect bits in header (9.1.1, 9.1.2)	-	-	-	-	Flags 2 bit 7	Flags 2 bit 7 and Flags 1 bit 5	Flags 2 bit 7	Flags 2 bit 7

	V1	V2	V3	V4	V5	V6	V7	V8
Sound effects can repeat (9.4.3)	-	-	-	-	Yes	Yes	Yes	Yes
Input stream 1 (10.2)	-	-	Yes	Yes	Yes	Yes	Yes	Yes
Mouse (10.3)	-	-	-	-	Yes	Yes	Yes	Yes
Directly readable mouse buttons (10.3.3)	-	-	-	-	-	Yes	-	-
Mouse can be constrained to windows (10.3.4)	-	-	-	-	-	Yes	-	-
Mouse menus (10.4)	-	-	-	-	-	Yes	-	-
Terminating characters table (10.5.2.1)	-	-	-	-	Yes	Yes	Yes	Yes
Single character input (10.6)	-	-	-	Yes	Yes	Yes	Yes	Yes
Line input buffer byte 0 (15.read)	Maximum input length minus 1	Maximum input length minus 1	Maximum input length minus 1	Maximum input length minus 1	Maximum input length	Maximum input length	Maximum input length	Maximum input length
Line input buffer byte 1 (15.read)	First returned character	First returned character	First returned character	First returned character	Length of text	Length of text	Length of text	Length of text
Line input text has zero terminator (15.read)	Yes	Yes	Yes	Yes	-	-	-	-
Line input tokenization is optional (15.read)	-	-	-	-	Yes	Yes	Yes	Yes

Screen Model

	V1	V2	V3	V4	V5	V6	V7	V8
Font size written to header (8.1.1, 11.1)	-	-	-	-	Width, height	Height, width	Width, height	Width, height
Character graphics bit in header (8.1.5.1, 11.1)	-	-	-	-	Yes	-	Yes	Yes

	V1	V2	V3	V4	V5	V6	V7	V8
Interpreter responsible for status line (8.2, 10.5.1)	Yes	Yes	Yes, and set header bit if unable to provide	-	-	-	-	-
“Time game” bit in header (8.2.1, 11.1)	-	-	Yes	-	-	-	-	-
Colored text output (8.3)	-	-	-	-	Yes	Yes, per window	Yes	Yes
Colors 10-12 and -1 supported (8.4)	-	-	-	-	-	Yes	-	-
Interpreter writes default colors in header even if colors not supported (8.3.2)	-	-	-	-	-	Yes	-	-
Screen size in units written to header (8.4.3)	-	-	-	-	Yes	Yes	Yes	Yes
Screen windows (8.6.1, 8.7.2, 8.8.3)	1	1	2	2	2	8	2	2
Clear upper window when splitting (8.6.1.1.2)	-	-	Yes	-	-	-	-	-
Initial lower window cursor position (8.6.3, 8.7.2.2)	Bottom	Bottom	Bottom	Bottom	Top	Top [†]	Top	Top
Text styles (8.7.1)	-	-	-	Yes	Yes	Yes	Yes	Yes
Game can move cursor (8.7.2.3, 8.8.3.5)	-	-	-	Yes, upper window only	Yes, upper window only	Yes, all windows	Yes, upper window only	Yes, upper window only
Upper window always fixed-pitch (8.7.2.4)	-	-	-	Yes	Yes	-	Yes	Yes
Upper window never buffered (8.7.2.5)	-	-	Yes	Yes	Yes	-	Yes	Yes

[†] Applies to all windows in V6.

	V1	V2	V3	V4	V5	V6	V7	V8
Cursor movement after @erase_window (8.7.3.2.1)	-	-	-	Bottom left for lower window, top left for upper window	Top left	Top left	Top left	Top left
Interpreter sets header bit to request status line redraw (8.8.2)	-	-	-	-	-	Yes	-	-
Overlapping, movable windows (8.8.3)	-	-	-	-	-	Yes		
Window attributes and properties (8.8.3.1, 8.8.3.2)	-	-	-	-	-	Yes	-	-
Pictures (8.8.6)	-	-	-	-	-	Yes	-	-

Header Fields

	V1	V2	V3	V4	V5	V6	V7	V8
Original Flags 1 bits (11.1)	-	-	1, 2, 4, 5, 6	-	-	-	-	-
New Flags 1 bits (11.1)	-	-	-	2, 3, 4, 7	0, 2, 3, 4, 7	0, 1, 2, 3, 4, 5, 7	0, 2, 3, 4, 7	0, 2, 3, 4, 7
Flags 2 bits (11.1)	0	0	0, 1	0, 1	0, 1, 3, 4, 5, 6, 7	0, 1, 2, 3, 4, 5, 6, 7, 8	0, 1, 3, 4, 5, 6, 7	0, 1, 3, 4, 5, 6, 7
File length and checksum in header (11.1)	-	-	Yes	Yes	Yes	Yes	Yes	Yes
Interpreter number and version in header (11.1)	-	-	-	Yes	Yes	Yes	Yes	Yes
Screen size (rows/columns) in header (11.1)	-	-	-	Yes	Yes	Yes	Yes	Yes
Screen size (units) in header (11.1)	-	-	-	-	Yes	Yes	Yes	Yes
Routine and string offsets in header (11.1)	-	-	-	-	-	Yes	-	-

	V1	V2	V3	V4	V5	V6	V7	V8
Output stream 3 total width written to header (11.1)	-	-	-	-	-	Yes	-	-
Header extension table (11.1)	-	-	-	-	Yes	Yes	Yes	Yes

Routines and Instructions

	V1	V2	V3	V4	V5	V6	V7	V8
Entry point (5.4, 5.5, 11.1)	Byte address of instruction	Byte address of instruction	Byte address of instruction	Byte address of instruction	Byte address of instruction	Packed address of routine	Byte address of instruction	Byte address of instruction
EXT opcode format (4.3)	-	-	-	-	Yes	Yes	Yes	Yes
Initial local variable values in routine header (5.2.1)	Yes	Yes	Yes	Yes	-	-	-	-
Maximum routine arguments (6.4.1)	3	3	3	7 [‡]	7	7	7	7
@aread	-	-	-	-	Yes	Yes	Yes	Yes
@art_shift	-	-	-	-	Yes	Yes	Yes	Yes
@buffer_mode	-	-	-	Yes	Yes	Yes	Yes	Yes
@call	Yes	Yes	Yes	-	-	-	-	-
@call_1n	-	-	-	-	Yes	Yes	Yes	Yes
@call_1s	-	-	-	Yes	Yes	Yes	Yes	Yes
@call_2n	-	-	-	-	Yes	Yes	Yes	Yes
@call_2s	-	-	-	Yes	Yes	Yes	Yes	Yes
@call_vn	-	-	-	-	Yes	Yes	Yes	Yes
@call_vn2	-	-	-	-	Yes	Yes	Yes	Yes
@call_vs	-	-	-	Yes	Yes	Yes	Yes	Yes
@call_vs2	-	-	-	Yes	Yes	Yes	Yes	Yes
@catch	-	-	-	-	Yes	Yes	Yes	Yes
@check_arg_count	-	-	-	-	Yes	Yes	Yes	Yes
@check_unicode	-	-	-	-	Yes	Yes	Yes	Yes
@copy_table	-	-	-	-	Yes	Yes	Yes	Yes
@draw_picture	-	-	-	-	-	Yes	-	-
@encode_text	-	-	-	-	Yes	Yes	Yes	Yes
@erase_line	-	-	-	Yes, operand must be 1	Yes, operand must be 1	Yes, operand is number of pixels	Yes, operand must be 1	Yes, operand must be 1
@erase_picture	-	-	-	-	-	Yes	-	-
@erase_window	-	-	-	Yes	Yes	Yes	Yes	Yes
@get_cursor	-	-	-	Yes	Yes	Yes	Yes	Yes

[‡] 6.4.1 incorrectly lists the maximum number of routine arguments in V4 as 3, but in fact V4 has the @call_vs2 opcode, which allows 7.

	V1	V2	V3	V4	V5	V6	V7	V8
@get_wind_prop	-	-	-	-	-	Yes	-	-
@input_stream	-	-	Yes	Yes	Yes	Yes	Yes	Yes
@log_shift	-	-	-	-	Yes	Yes	Yes	Yes
@make_menu	-	-	-	-	-	Yes	-	-
@mouse_window	-	-	-	-	-	Yes	-	-
@move_window	-	-	-	-	-	Yes	-	-
@not	1OP:143	1OP:143	1OP:143	1OP:143	VAR:248	VAR:248	VAR:248	VAR:248
@output_stream	-	-	Yes	Yes	Yes, with optional 2 nd operand	Yes, with optional 2 nd and 3 rd operands	Yes, with optional 2 nd operand	Yes, with optional 2 nd operand
@picture_data	-	-	-	-	-	Yes	-	-
@picture_table	-	-	-	-	-	Yes	-	-
@piracy	-	-	-	-	Yes	Yes	Yes	Yes
@pop	Yes	Yes	Yes	Yes	-	-	-	-
@pop_stack	-	-	-	-	-	Yes	-	-
@print_form	-	-	-	-	-	Yes	-	-
@print_table	-	-	-	-	Yes	Yes	Yes	Yes
@print_unicode	-	-	-	-	Yes	Yes	Yes	Yes
@pull	Yes	Yes	Yes	Yes	Yes	Yes, with optional operand	Yes	Yes
@push_stack	-	-	-	-	-	Yes	-	-
@put_wind_prop	-	-	-	-	-	Yes	-	-
@read_char	-	-	-	Yes	Yes	Yes	Yes	Yes
@read_mouse	-	-	-	-	-	Yes	-	-
@restore	OOP:182, branches	OOP:182, branches	OOP:182, branches	OOP:182, stores	EXT:1, stores, 3 optional operands	EXT:1, stores, 3 optional operands	EXT:1, stores, 3 optional operands	EXT:1, stores, 3 optional operands
@restore_undo	-	-	-	-	Yes	Yes	Yes	Yes
@save	OOP:181, branches	OOP:181, branches	OOP:181, branches	OOP:181, stores	EXT:0, stores, 3 optional operands	EXT:0, stores, 3 optional operands	EXT:0, stores, 3 optional operands	EXT:0, stores, 3 optional operands
@save_undo	-	-	-	-	Yes	Yes	Yes	Yes
@scan_table	-	-	-	Yes	Yes	Yes	Yes	Yes
@scroll_window	-	-	-	-	-	Yes	-	-

	V1	V2	V3	V4	V5	V6	V7	V8
@set_colour	-	-	-	-	Yes	Yes, with optional 3 rd operand	Yes	Yes
@set_cursor	-	-	-	Yes	Yes	Yes, with optional 3 rd argument	Yes	Yes
@set_font	-	-	-	-	Yes	Yes	Yes	Yes
@set_margins	-	-	-	-	-	Yes	-	-
@set_text_style	-	-	-	Yes	Yes	Yes	Yes	Yes
@set_window	-	-	Yes	Yes	Yes	Yes	Yes	Yes
@show_status	-	-	Yes	No effect	No effect	No effect	No effect	No effect
@sound_effect	-	-	Yes	Yes	Yes	Yes	Yes	Yes
@split_window	-	-	Yes	Yes	Yes	Yes	Yes	Yes
@sread	Yes	Yes	Yes	Yes, with optional 3 rd and 4 th operands	-	-	-	-
@throw	-	-	-	-	Yes	Yes	Yes	Yes
@tokenise	-	-	-	-	Yes	Yes	Yes	Yes
@verify	-	-	Yes	Yes	Yes	Yes	Yes	Yes
@window_size	-	-	-	-	-	Yes	-	-
@window_style	-	-	-	-	-	Yes	-	-