Photoshop Custom Shapes File Format

Contents

This document provides information about the (undocumented yet) format of custom shapes files in Photoshop.

Note: all multi-byte values, i.e., integer numbers (including C-style 4-character constants), fixed-point numbers, and Unicode characters are coded in big-endian format.

Custom shapes file format

Custom shapes file

Name	Type	Kind	Description
`CustomShapes.psp`	`'8BPF'`	Custom shapes file	Adobe Photoshop preferences file containing all the custom shapes listed in the Preset Manager. **Warning**: like most preferences files, the custom shapes file is not updated in real-time: it is read by the application only once at start-up (launch) time and written back at shut-down (quit) time.
`*.csh`	`'8BCS'`	Custom shapes file	Adobe Photoshop custom shapes file; generally produced by saving a selected set of custom shapes from the Preset Manager.

Length (in bytes)	Description	Comments
4	Magic number (= `'cush'`)	C-style 4-character constant.
4	Version (= 2)	32-bit integer.
4	Number of custom shapes	32-bit integer.
Variable	Sequence of custom shapes	Each in Custom shape format.

Custom shape

Length (in bytes)	Description	Comments
Variable	Custom shape name	Unicode string format.
0 or 2	Extra null padding	Only if length of previous Unicode string is odd.
4	Unknown (= 1)	32-bit integer.
4	Length (in bytes) of remaining custom shape data	32-bit integer.

1 + 36	Custom shape ID (UUID)	Pascal-style string format.
16	Reference bounds for anchor and control points	Bounds rectangle format.
Variable	Sequence of path records	Each in Path record format.
1 or 3	Extra null padding	To match the above length of remaining custom shape data (always a multiple of 4).

Unicode string

Length (in bytes)	Description	Comments
4	Number of Unicode characters	32-bit integer.
Variable	String of Unicode characters	Two bytes per character; includes terminating null.

Pascal-style string

Length (in bytes)	Description	Comments
1	Number of characters	8-bit integer (unsigned).
Variable	String of characters	One byte per character; no terminating null.

Bounds rectangle

Length (in bytes)	Description	Comments
4	Top coordinate (in pixels)	32-bit integer (signed).
4	Left coordinate (in pixels)	32-bit integer (signed).
4	Bottom coordinate (in pixels)	32-bit integer (signed).
4	Right coordinate (in pixels)	32-bit integer (signed).

Path record

Length (in bytes)	Description	Comments
2	Selector	16-bit integer: • 0 (closed subpath length record) • 1 (closed subpath Bezier knot, linked) • 2 (closed subpath Bezier knot, unlinked) • 3 (open subpath length record) • 4 (open subpath Bezier knot, linked) • 5 (open subpath Bezier knot, unlinked) • 6 (path fill rule record) • 7 (clipboard record) • 8 (initial fill rule record)
24	Path record data	Depending on selector: • Subpath length record format • Subpath Bezier knot format • Subpath Bezier knot format • Subpath length record format • Subpath Bezier knot format • Subpath Bezier knot format • Path fill rule record format • Clipboard record format (not used) • Initial fill rule record format

Cf. Path resource format of the page Adobe Photoshop File Formats Specification for more details about the way paths are stored in a Photoshop document.

Path fill rule record

Length (in bytes)	Description	Comments
24	Unused	Should be zeroes.

Initial fill rule record

Length (in bytes)	Description	Comments
2	Initial fill (= 0)	16-bit integer (unsigned); should be 0 or 1 (fill starts with all pixels); not used.
22	Unused	Should be zeroes.

Subpath length record

Length (in bytes)	Description	Comments
2	Subpath length (number of Bezier knots)	16-bit integer (unsigned).
22	Unused	Should be zeroes.

Subpath Bezier knot

Length (in bytes)	Description	Comments
8	Backward control point for the Bezier segment preceding the knot	Path point format.
8	Anchor point for the knot	Path point format.
8	Forward control point for the Bezier segment leaving the knot	Path point format.

Cf. Bezier curves.

Path point

Length (in bytes)	Description	Comments
4	Vertical component	32-bit fixed-point number (signed), in Q8.24 format.
4	Horizontal component	32-bit fixed-point number (signed), in Q8.24 format.

Fixed-point numbers are implemented here as 32-bit integers, with 8 bits before the binary point and 24 bits after the binary point. In JavaScript, since all numbers are represented as floating-point numbers, appropriate values are simply obtained by dividing the extracted 32-bit signed integer values by 0x1000000 (2^{24}).

The resulting horizontal and vertical component values of a path point always fall between 0.0 and 1.0 (both exclusive). [0.0, 0.0] and [1.0, 1.0] correspond respectively to the top-left and bottom-right corners of the bounds rectangle, which appears to have an extra "safety" margin of 1 pixel in each direction (i.e.: top, left, bottom, right).

Path records order

For each custom shape, the first path record is always a "path fill rule record" (selector: 6), immediately followed by an "initial fill rule record" (selector: 8), whose initial fill value (0 or 1) is apparently not used.

Then, for each subpath:

- a "closed subpath length record" (selector: 0) is followed by a sequence of either "closed subpath Bezier knot, linked" (selector: 1) or "closed subpath Bezier knot, unlinked" (selector: 2),

or

- an "open subpath length record" (selector: 3) is followed by a sequence of either "open subpath Bezier knot, linked" (selector: 4) or "open subpath Bezier knot, unlinked" (selector: 5).

Parsing custom shapes files

A practical set of JavaScript functions for parsing custom shapes files is contained in the module jamShapes, which is part of the JSON Action Manager scripting library. It is used by the following utility scripts:

- Convert Custom Shapes File to SVG Set: [Photoshop CS3 or later] convert a custom shapes file (.csh) or a custom shapes preferences file (CustomShapes.psp) into a set of SVG files.
- Insert Custom Shape Path: [Photoshop CS3 or later] create a work path from a custom shape contained in a custom shapes file (.csh).
- Parse Custom Shapes File: [Photoshop CS3 or later] parse a custom shapes file (.csh) or a custom shapes preferences file (CustomShapes.psp) into a JSON text file.
- Preview Custom Shapes File: [Photoshop CS3 or later] graphically preview a custom shapes file (.csh) or a custom shapes preferences file (CustomShapes.psp) in a new image document.

All files are open-source and licensed under GPLv3; the utility scripts have been successfully tested in Photoshop CS4 on Mac OS X, but should be platform agnostic.

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