PDA Memory Card Extended File Header

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About This Manual

This manual is the 1.0 release of the PDA Memory Card Extended File Header documentation.

Changes Since Last Release

This is the first English release of this documentation.

Related Documentation

This manual should be read in conjunction with the following documents:

PDA Hardware Specification

PDA Kernel Specification

Developer Reference Series

This manual is part of the *Developer Reference Series*, a series of technical reference volumes covering all aspects of PlayStation development. The complete series is listed below:

Manual	Description
PlayStation Hardware	Describes the PlayStation hardware architecture and overviews its subsystems.
PlayStation Operating System	Describes the PlayStation operating system and related programming fundamentals.
Run-Time Library Overview	Describes the structure and purpose of the run-time libraries provided for PlayStation software development.
Run-Time Library Reference	Defines all available PlayStation run-time library functions, macros and structures.
Inline Programming Reference	Describes in-line programming using DMPSX, GTE inline macro and GTE register information.
SDevTC Development Environment	Describes the SDevTC (formerly "Psy-Q") Development Environment for PlayStation software development.
3D Graphics Tools	Describes how to use the PlayStation 3D Graphics Tools, including the animation and material editors.
Sprite Editor	Describes the Sprite Editor tool for creating sprite data and background picture components.
Sound Artist Tool	Provides installation and operation instructions for the DTL-H800 Sound Artist Board and explains how to use the Sound Artist Tool software.
File Formats	Describes all native PlayStation data formats.
Data Conversion Utilities	Describes all available PlayStation data conversion utilities, including both stand-alone and plug-in programs.
CD Emulator	Provides installation and operation instructions for the CD Emulator subsystem and related software.
CD-ROM Generator	Describes how to use the CD-ROM Generator software to write CD-R discs.

Performance Analyzer User Guide	Provides general instructions for using the Performance Analyzer software.
Performance Analyzer Technical Reference	Describes how to measure software performance and interpret the results using the Performance Analyzer.
DTL-H2000 Installation and Operation	Provides installation and operation instructions for the DTL-H2000 Development System.
DTL-H2500/2700 Installation and Operation	Provides installation and operation instructions for the DTL-H2500/H2700 Development Systems.

Typographic Conventions

Certain Typographic Conventions are used through out this manual to clarify the meaning of the text. The following conventions apply to all narrative text except for structure and function descriptions:

Convention	Meaning
courier	Indicates literal program code.
Bold	Indicates a document, chapter or section title.

The following conventions apply within structure and function descriptions only:

Convention	Meaning
Medium Bold	Denotes structure or function types and names.
Italic	Denotes function arguments and structure members.

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Memory Card Extended File Header

The Memory Card file header has been extended for use in PDA applications.

Conventional file header

The file header structure that was previously used is shown below. Application data is placed immediately after the header.

Table 1: Conventional file header

Item	No. of bytes	Notes
Magic	2	Always 'SC'
Type	1	0x11/0x12/0x13 *1
Number of blocks	1	
Document name	64	Shift JIS code *2
pad	28	All 0x00
CLUT	32	CLUT entry x 16 *3
Icon image 1	128	Required (16 x 16 bits x 4 planes)
Icon image 2	128	Only when Type=12,13
Icon image 3	128	Only when Type=13

*1: Type: Indicates number of icon images. An icon image is substituted when animation is performed.

*2: 32 characters of non-kanji and Level 1 Kanji only. 0x84bf through 0x889e should not be used. If the length of the string is less than 32 characters, the string is terminated with a 0x00.

*3: CLUT: Actual display color assigned to color number.

CLUT= (B[4:0] << 10) | (G[4:0] << 5) | R[4:0]

File header for PDAs

For PDA applications, the Memory Card file header has been extended as shown in the table below. Changes are shown by the marks outside the columns. If an application is not a PDA application, the conventional file header can be used.

Table 2: Extended file header

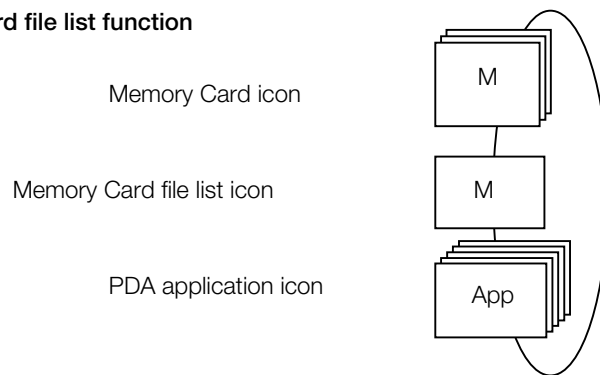| Item	Size	Notes	Change
Magic	2	Always 'SC'	
Type	1	0x11/0x12/0x13	
Number of blocks	1		
Document name	64	Shift JIS code *2	
pad	12	All 0x00	
Number of icons for Memory Card file list	2	For PDA file list	
File type	4	"MCX0", "MCX1", "CRD0"	
Number of application selection icon entries	1	Total number of icons to be scrolled	
Number of user-defined device entries	1	Number of required tables	
Reserved	4	All 0x00	
Starting address of program	4	LSB first	
CLUT	32	CLUT entry x 16 *3	
Icon image 1	128	Required (16 x 16 bits x 4 planes)	
Icon image 2	128	Only when Type=12, 13	
Icon image 3	128	Only when Type=13	
RAM save area	2048	Only if file type is "MCX1"	
Device entry table	128×n	4 bytes x 2 for each device	
Icon for Memory Card file list	128×n	32 x 32 bits x n units	
Application selection icon entry	128×n	4 bytes x 2 for each unit to scroll	
Application selection icon image	128×n	32 x 32 bits x n units	

Overview of extensions

Previously, information was added to the pad area within the file header. In the extended format, the RAM save area, the device entry table, and icon data are added and placed immediately after the icon images.

This additional information is used by the PDA for the Memory Card file list and application selection functions.

Memory card file list function

The Memory Card file list icons are used for the Memory Card file list feature of the PDA. When Memory Card file list icons are not available (if the icon count is 0), the first application selection icon is displayed if the file type is "MCX[01]". If the file identifier is "CRD0", the icon image is displayed. Icon images are also used for files having conventional file headers.
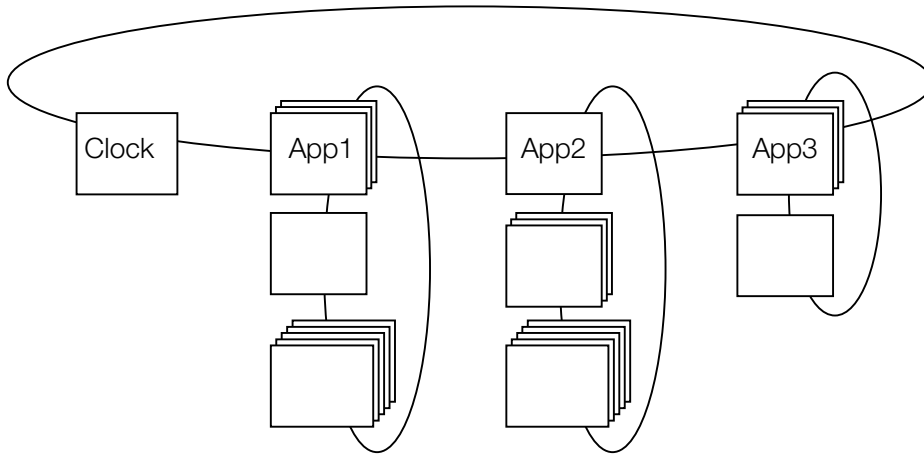
Figure 1: Memory Card file list function

Memory Card icon

Memory Card file list icon

PDA application icon

Application selection function

Application selection icons are used for application selection by the main PDA. If the file type is "MCX0" or "MCX1", the file will be handled as a PDA application.

More than one selection icon can be set up for a single application. Each icon can include animation that is performed with an arbitrary number of icons.

Figure 2: PDA application selection function

Number of Memory Card file list icons

Memory card file list icons

When the Memory Card file list appears on the PDA, animated icons can be displayed. 32 x 32 black-and-white dots (2 values) are displayed in sequence to provide animation for each icon.

If the number of file list icons is one or more, animation is performed using the icons provided by the list. If the file type is "MCX0" or "MCX1" (i.e. a PDA application) and no file list icons are provided, animation is performed using the first icon in the application selection icon entry.

If the file is a type other than a PDA application ("CRD0" in particular), and the file list icon count is one or more, then the assumption is that file list icons are available and these icons will be used when the file list is displayed. However, if the file list icon count is 0 or the file type is not "CRD0", it is assumed that no file list icons are available.

If the file type is "MCX0" or "MCX1" and no application selection icons or file list icons are available, or if the file type is "CRD0" and the file list icon count is 0, or if the file type is none of these, the standard icon image is converted to a 32 x 32 dot black-and-white image and file list animation is performed.

If the file type is "CRD0", then the application selection icon entry count, the user-defined device entry count, the reserved space and the program starting address must all be filled with NULLs (0x00). Consequently the RAM save area, the device entry table, the application selection icon entries and the application selection icon image fields will not be available.

File types

If the file is a PDA application, the file type will be either "MCX0" or "MCX1" and the application can be executed as an ARM program. All other file types indicate non-PDA applications and are not executable.

If the file type is "MCX0", the file is a PDA application without a RAM save area so it must always be cold-started. If the file type is "MCX1", the file is a PDA application with 2048 bytes reserved for the RAM save area and depending on how the application exited, it could be either cold-started or hot-started.

The "CRD0" file type is used for files that are not PDA applications but that provide 32 x 32 dot icons for LCD animation. The PDA file list icon count is meaningless for file types other than "MCX0", "MCX1", and "CRD0".

Application selection icon entry count

Application selection icon entries

Application selection icon images

Animated icons can be displayed for the PDA application selection function. The icon entry count is set to the total number of animation types provided for the application. The actual icon images are stored from the start of the "Application selection icon image" area. Each scrollable icon can use animated icons. Each icon animation entry contains the number of icons, the rate at which animated icons are switched and the starting address where the images are stored.

The address at which images are stored must be specified as an absolute address beginning at location 0x2000000.

Table 3: Icon animation entries

Word (32 bits)
Animation icon count for scroll icon 1
Address where animation icons for scroll icon 1 are stored
Animation icon count for scroll icon 2
Address where animation icons for scroll icon 1 are stored
. . . . . .
. . . . . .
Animation icon count for scroll icon n
Address where animation icons for scroll icon n are stored

User-defined device entry count

Number of user-defined devices for reads and writes from the PlayStation to the PDA.

Program starting address

The address specified here is assumed to be an absolute address and is used for program execution. No error handling is performed even if an invalid address is specified.

Device entry table

Starting with the beginning of the table, devices are identified in sequence with device numbers 128, 129, 130, ... If the device count exceeds 16, the next 128 bytes are reserved to hold an additional entry table for device numbers 136, 137, ...

Table 4: Device entry table

Word (32 bit)
Data length of fixed part of device 1
Data transfer routine for device 1
Data length of fixed part of device 2
Data transfer routine for device 2
. . . . . .
Data length of fixed part of device n
Data transfer routine for device n

RAM save area

Contents of RAM that are needed to restart an interrupted program are saved here. This area is only present if the file type is "MCX1" and is not available for file types "MCX0" or "CRD0".