AudioPlayer Skin Specification

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1. Introduction

1.1 Summary

This specification defines the bitmap resource used for buttons and icons in the AudioPlayer application and explains how to incorporate them into a resource database.(PRC file).

1.2 Technical name

The resource database defined in this specification is called an ”AudioPlayer Skin”.

1.3 Features of an AudioPlayer Skin

AudioPlayer uses a separate resource database for its bitmap resources. By changing the AudioPlayer Skin, the GUI of AudioPlayer can be changed.

An AudioPlayer Skin has the following features and limitations:

- Bitmaps for the GUI can be changed.
- The location and dimensions of the bitmaps are fixed.
- Uses the standard system color palette (PalmOS® 3.5 software or application only).

1.4 Creating an AudioPlayer Skin

As ordinary PRC flies, AudioPlayer Skin is created by using development tools. This spec explains the way to use CodeWarrior® software.

2. Specifications of an AudioPlayer Skin

2.1 Summary

The essential resources for an AudioPlayer Skin are one string resource and many bitmap resources (BitmapFamily + Bitmap).

The version of the AudioPlayer Skin is stored into a string resource with an ID of 9000 (decimal).

All BitmapFamily resources included in an AudioPlayer Skin are shown in Table 1. The actual resource of Bitmap is prepared as Bitmap resource. It currently is recommended that the Bitmap resource ID numbers be assigned using the following convention: add the resource ID number of the corresponding BitmapFamily to the bit-depth of the Bitmap resource.

Example） In BitmapFamily 4000, a 256-color (8-bit) Bitmap resource should have the ID number 4008.

Table 1: Bitmap resources of an AudioPlayer Skin

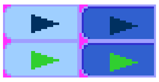
Category	ResourceID	Resource name	version.		Applicable	
			1.X	2.X	Display	Parts
Background	4000	PBPanelWallPaper	○	○	Normal display VE display	Background
	4300	ListPanelWallPaper	○	○	List display	Background
Playback Btn	4600	LargeStop	○	○	Normal display VE display	Stop Btn
	4700	LargePlay	○	○	Normal display VE display	Playback Btn
	4800	LargeNextPrev	○	○	Normal display VE display	AMS+,− Btn
	4900	LargeVolUpDown	○	○	Normal display VE display	Volume Btn
	5300	LargeDispMode	○	○	Normal display	Counter change Btn
	5400	LargeDispMode2		○	VE display List display	VE, List change view Btn
	5500	LargeABRepeat	○	○	Display all	AB Repeat Btn
	5600	LargeAVLS	○	○	Normal display VE display	AVLS bBtn
	6000	SmallStop		○	List display	Stop Btn
	6100	SmallPlay		○	List display	Playback Btn
	6200	SmallNextPrev		○	List display	AMS+,− Btn
	6300	SmallVolUpDown		○	List display	Volume Btn
	6800	LargeRepeatMode	○	○	Display all	Rpt Mode Btn
	6900	LargeDirection	○	○	Display all	DirModeBtn
Counter	4400	LargeCounterFont	○	○	Normal display	Counter
Meters	8200	BatteryMeter		○	Display all	Battery level display
	8300	SmallVolSlider	○	○	Normal display VE display	Volume Btn
	8400	LargePosSlider	○	○	Display all	Playback Btn
Info Btn	7300	TrackInfo	○	○	Normal display	Track information
	7500	SmallTrackInfo		○	List display	Track information
	8700	MSIcon	○	○	Display all	Memory stick Btn
	8800	AlbumIcon		○	Display all	Album info Btn
Label, icon	7600	AlbumListTitle		○	″About MS ″ display	Album list title
	7700	PickupTitle		○	″Pick up″ display	Album list title
	7800	ListTitle		○	List display	Album list title
	8500	TrackLabel	○	○	Normal display	″TRACK″ label
	8600	DispModeIcon	○	○	Normal display	″TIME″/″REMAIN″ label
Change view	5700	PanelBtn	○	○	Display all	Change view Btn
Jog function	4100	JogIconSelectWallPap	○	○	Select JOG func	Background
	5800	JogIconNo	○	○	Select JOG func	Jog function number Btn
	7400	JogIconBtn	○	○	Display all, Select JOG func	Jog function display
VE, Animation	8000	VEBitmapLevelFG		○	VE display	Lighting pattern of Bitmap level meter
	8100	VEBitmapLevelBG		○	VE display	Light-off pattern of Bitmap level
	9000	TransferAnime	○	○	″Transfer mode″ display	Scroll animation during transfer
	9200	TransferBack		○	″Transfer mode″ display	Scroll animation during transfer
Others	5100	LargeSpeaker	○		Normal display	Speaker icon (Unused on ver.2.X)
	5900	BusyLED		○	Display all	(Unused)

2.2 Bitmap matrix

If each bitmapwere stored in a separate resource, the number of resources would be too large to manage easily, and the amount of data overheard would be significant. To alleviate this problem, an AudioPlayer Skin consolidates bitmaps of the same dimensions and bit-depth, logically arranged, into one large bitmap. This bitmap aggregate is called a ”bitmap matrix”.

Chart 1 is an example of a bitmap matrix for the Play button.

Chart 1：Example of a bitmap matrix



This bitmap matrix consists of 4 bitmaps. The state of the button (released or pressed) determines the column, and the state of AudioPlayer (stopped or playing) determines the row. For each bitmap matrix, the meaning and the order of the rows and columns are fixed. The images thus should be arranged accordingly.

Each bitmap in a bitmap matrix is called a ”cell”.

Almost all bitmap resources shown in Table 1 are treated as bitmap matrices.

AudioPlayer displays only the necessary cells from a bitmap matrix.

2.3 Bitmap Specification

This section describes the detailed specifications for each bitmap resource.

The terminology used in the specifications is given below.

Size：

The dimensions in pixels of the bitmap matrix, given as width × height.

Matrix：

Specifies how to divide the bitmap matrix into cells.

nC, mR signifies n columns, m rows.

Cell size：

The size of each bitmap (cell) in the matrix, given as width × height.

Transparent color：

Represents if a transparent color is allowed.

Matrix definition：

Specifies the layout of the row and columns of the matrix. In most cases, columns represent different button states (released or pressed).

2.3.1 Background

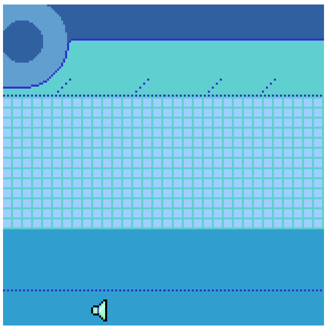
Each number starting with the # symbol represents the resource ID number of the BitmapFamily.

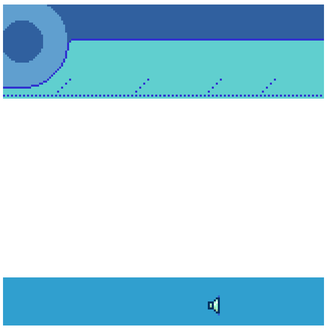
PBPanelWallPaper (#4000), ListPanelWallPaper (#4300)

■ Bitmap spec

Size	Matrix	Cell size	Transparent color
160 × 160	None		Unavailable

- Design example





2.3.2 Playback buttons

LargeStop (#4600)

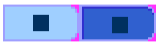
- Bitmap spec

Size	Matrix	Cell size	Transparent color
76 × 18	2C, 1R	38 × 18	Available

- Matrix definition

Released	Pressed

- Design example



LargePlay (#4700)

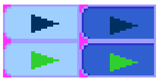
- Bitmap spec

Size	Matrix	Cell size	Transparent color
76 × 36	2C, 2R	38 × 18	Available

- Matrix definition

	Released	Pressed
Stopped		
Playing		

- Design example



LargeNextPrev (#4800)

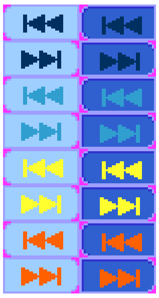
- Bitmap spec

Size	Matrix	Cell size	Transparent color
76 × 144	2C, 8R	38 × 18	Available

- Matrix definition

	Released	Pressed
Released (AMS-)		
Released (AMS+)		
Speed 1(AMS-)		
Speed 1(AMS+)		
Speed 2(AMS-)		
Speed 2(AMS+)		
Speed 3(AMS-)		
Speed 3(AMS+)		

- Design example



LargeVolUpDown (#4900)

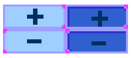
- Bitmap spec

Size	Matrix	Cell size	Transparent color
62 × 24	2C, 2R	31 × 12	Available

- Matrix definition

	Released	Pressed
Volume＋		
Volume－		

- Design example



LargeDispMode (#5300)

- Bitmap spec

Size	Matrix	Cell size	Transparent color
46 × 13	2C, 1R	23 × 13	Available

- Matrix definition

Released	Pressed

- Design example

LargeDispMode2 (#5400)

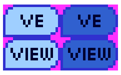
- Bitmap spec

Size	Matrix	Cell size	Transparent color
46 × 26	2C, 2R	23 × 13	Available

- Matrix definition

	Released	Pressed
VE display		
List display		

- Design example



LargeABRepeat (#5500)

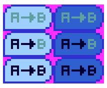
- Bitmap spec

Size	Matrix	Cell size	Transparent color
50 × 39	2C, 3R	25 × 13	Available

- Matrix definition

	Released	Pressed
No setting		
Set point A		
AB repeat		

- Design example



LargeAVLS (#5600)

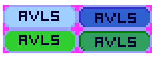
- Bitmap spec

Size	Matrix	Cell size	Transparent color
74 × 24	2C, 2R	37 × 12	Available

- Matrix definition

	Released	Pressed
AVLS OFF		
AVLS ON		

- Design example



SmallStop (#6000)

- Bitmap spec

Size	Matrix	Cell size	Transparent color
46 × 15	2C, 1R	23 × 15	Available

- Matrix definition

Released	Pressed

- Design example

SmallPlay (#6100)

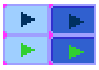
- Bitmap spec

Size	Matrix	Cell size	Transparent color
46 × 30	2C, 2R	23 × 15	Available

- Matrix definition

	Released	Pressed
Stopped		
Playing		

- Design example



SmallNextPrev (#6200)

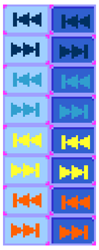
- Bitmap spec

Size	Matrix	Cell size	Transparent color
46 ×120	2C, 8R	23 × 15	Available

- Matrix definition

	Released	Pressed
Normal (AMS-)		
Normal (AMS+)		
Speed 1(AMS-)		
Speed 1(AMS+)		
Speed 2(AMS-)		
Speed 2(AMS+)		
Speed 3(AMS-)		
Speed 3(AMS+)		

■ Design example



SmallVolUpDown (#6300)

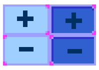
■ Bitmap spec

Size	Matrix	Cell size	Transparent color
46 × 30	2C, 2R	23 × 15	Available

■ Matrix definition

	Released	Pressed
Volume＋		
Volume－		

■ Design example



LargeRepeatMode (#6800)

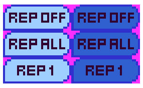
■ Bitmap spec

Size	Matrix	Cell size	Transparent color
68 × 39	2C, 3R	34 × 13	Available

■ Matrix definition

	Released	Pressed
No repeat		
Set A point		
AB repeat		

■ Design example



LargeDirection (#6900)

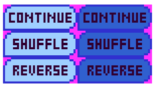
■ Bitmap spec

Size	Matrix	Cell size	Transparent color
74 × 39	2C, 3R	37 × 13	Available

- Matrix definition

	Released	Pressed
Continue		
Shuffle		
Reverse		

- Design example



2.3.3 Counter

LargeCounterFont (#4400)

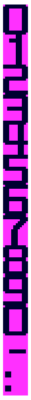
- Bitmap spec

Size	Matrix	Cell size	Transparent color
12 × 195	1C, 13R	12 × 15	Available

- Matrix definition

0	
1	
2	
3	
4	
5	
6	
7	
8	
9	
0	
Minus	
Colon	

- Design example



- Special notes
  The colon (:) has a width of 5 pixels and must begin at the left edge.

2.3.4 Meters

BatteryMeter (#8200)

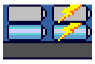
- Bitmap spec

Size	Matrix	Cell size	Transparent color
44 × 27	1C, 3R	22 × 9	Unavailable

- Matrix definition

	Battery-powered	Charging
Background (Empty)		
Foreground (Full)		
Indicator		

- Design example



- Special notes
  - The indicator line indicates the estimated amount of battery power remaining in the device. The indicator has a width of 1 pixel and must begin at the left edge of the cell.
  - There are 3 pixel margins on both the left and right sides of the background and foreground cells. These regions are not used to draw the dynamic meter graphic.

SmallVolSlider(#8300)

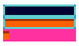
- Bitmap spec

Size	Matrix	Cell size	Transparent color
36 × 18	1C, 3R	36 * 6	Unavailable

- Matrix definition

Background	
Foreground	
Indicator	

- Design example



- Special notes
  - The indicator cell is required but currently is unused by AudioPlayer.
  - There are 1 pixel margins on both the left and right sides of the background and foreground cells. These regions are not used to draw the dynamic meter graphic.

LargePosSlider(#8400)

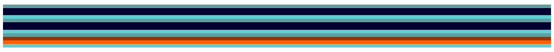
- Bitmap spec

Size	Matrix	Cell size	Transparent color
160 × 12	1C, 3R	160 × 4	Unavailable

- Matrix definition

Background	
Foreground	
Indicator	

- Design example



- Special notes
  - The indicator has a width of 10 pixels and must begin at the left edge of the cell..
  - The foreground and background cells do not have any margins.

2.3.5 Information button

TrackInfo(#7300)

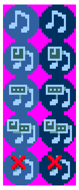
- Bitmap spec

Size	Matrix	Cell size	Transparent color
36 × 90	2C, 5R	18 × 18	Available

- Matrix definition

	Released	Pressed
No playback limit		
Playback limited by period		
Playback limited by times		
Playback limited by times and period		
Not available unable to playback		

- Design example



SmallTrackInfo(#7500)

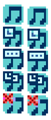
- Bitmap spec

Size	Matrix	Cell size	Transparent color
22 × 55	2C, 5R	11 × 11	Available

- Matrix definition

	Released	Pressed
No playback limit		
Playback limited by period		
Playback limited by times		
Playback limited by times and period		
Not available yet Unable to playback		

- Design example



MSIcon(#8700)

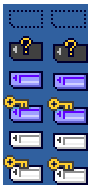
- Bitmap spec

Size	Matrix	Cell size	Transparent color
42 × 90	2C, 6R	21 × 15	Unavailable

- Matrix definition

	Released	Pressed
None		
Unknown stick		
MS		
Write-protected MS		
MG MS		
Write-protected MG MS		

- Design example



AlbumIcon(#8800)

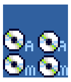
- Bitmap spec

Size	Matrix	Cell size	Transparent color
32 × 36	2C, 3R	16 × 12	Unavailable

- Matrix definition

	Released	Pressed
None		
ATRAC3 album		
MP3 album		

- Design example



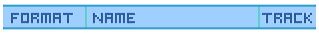
2.3.6 Labels and icons

AlbumListTitle(#7600)

- Bitmap spec

Size	Matrix	Cell size	Transparent color
156 × 12	None		Available

- Design example

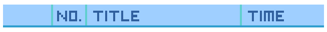


PickupTitle(#7700)

- Bitmap spec

Size	Matrix	Cell size	Transparent color
160 × 11	None		Available

- Design example



ListTitle(#7800)

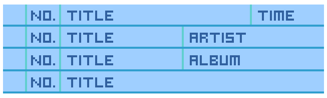
- Bitmap spec

Size	Matrix	Cell size	Transparent color
160 × 44	1C, 4R	160 × 11	Unavailable

- Matrix definition

Title, Time display	
Title, Artist name display	
Title Album name display	
Title display	

- Design example



- Special notes
  The positions of the TITLE, TIME, ARTIST, and ALBUM columns are fixed.

TrackLabel(#8500)

- Bitmap spec

Size	Matrix	Cell size	Transparent color
28 × 5	None		Available

- Design example

DispModeLabel(#8600)

- Bitmap spec

Size	Matrix	Cell size	Transparent color
30 × 10	1C, 2R	30 × 5	Unavailable

- Matrix definition

Elapsed Time	
Remaining Time	

- Design example

TIME
REMAIN

- Special notes
  Since a transparency color cannot be specified, each cell must include the appropriate portion of the background image. The upper-left corner of each cell is positioned at the coordinates (110, 53).

2.3.7 Switch the display

PanelBtn(#5700)

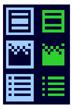
- Bitmap spec

Size	Matrix	Cell size	Transparent color
24 × 36	2C, 3R	12 × 12	Available

- Matrix definition

	Released	Pressed/selected
Normal display		
VE display		
List display		

- Design example



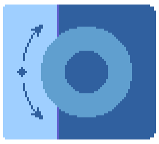
2.3.8 Jog Dial™navigator related functions

JogIconSelectWallPap(#4100)

- Bitmap spec

Size	Matrix	Cell size	Transparent color
76 × 67	None		Unavailable

- Design example



- Special notes

The position of the JOG icon is fixed.

JogIconNo(#5800)

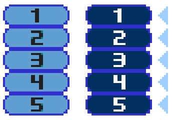
- Bitmap spec

Size	Matrix	Cell size	Transparent color
82 × 55	2C, 5R	41 × 11	Unavailable

- Matrix definition

	Released	Pressed/selected
1		
2		
3		
4		
5		

- Design example



JogIconBtn(#7400)

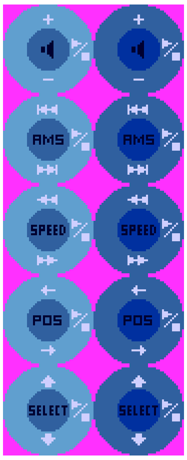
- Bitmap spec

Size	Matrix	Cell size	Transparent color
90 × 225	2C, 5R	45 × 45	Available

■ Matrix definition

	Released	Pressed
Function 1		
Function 2		
Function 3		
Function 4		
Function 5		

■ Design example



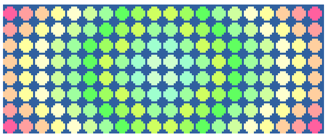
2.3.9 VE, Animation

VEBitmapLevelFG(#8000), VEBitmapLevelBG(#8100)

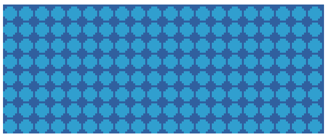
■ Bitmap spec

Size	Matrix	Cell size	Transparent color
160 × 64	None		Unavailable

■ Design example



(VEBitmapLevelFG)



(VEBitmapLevelBG)

■ Special notes

AudioPlayer draws portions of VEBitmapLevelFG during playback based on spectrum data.
VEBitmapLevelBG is the background to VEBitmapLevelFG.
VEBitmapLevelFG and VEBitmapLevelBG must be divided into 8×8 squares.

TransferAnime(#9000)

■ Bitmap spec

Size	Matrix	Cell size	Transparent color
180 × 11	None		Unavailable

- Design example

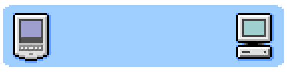
- Special notes
  - Used for the scrolling animation during transfer mode.
  - For a smooth animation, the bitmap should be created by placing two copies of a 90×11 image beside each other.
- Compatibility
  When createing AudioPlayerSkin for AudioPlayer Ver1.0, the bitmap size should be 190×16. For a smooth animation, a Ver1.0 bitmap should be created by placing two copies of a 95×16 image beside each other.

TransferBack(#9200)

- Bitmap spec

Size	Matrix	Cell size	Transparent color
140 × 31	None		Unavailable

- Design example



- Special notes
  Drawn as the background to the TransferAnime bitmap. A 90×11 pixel rectangle in the center is reserved for drawing the TransferAnime bitmap.

2.3.10 others

LargeSpeakerl(#5100)

- Bitmap spec

Size	Matrix	Cell size	Transparent color
8 × 11	None		Unavailable

- Design example

- Special notes
  Unused starting with ver.2.X (Incorporated into the background (PBPanelWallPaper).)

BusyLED(#5900)

- Bitmap spec

Size	Matrix	Cell size	Transparent color
8 × 45	1C, 3R	8 × 15	Available

- Special notes

  Required but currently unused. See “A.2 The BusyLED requirement”.

3. Steps in creating AudioPlayer Skin

3.1 Summary

As with general PRC files, the same tools are used to create AudioPlayer Skin databases:

(a) CodeWarrior® and Constructor® applications (Microsoft®Windows® and Mac® operating systems)

(b) PilRC (GCC environment)

This document focuses on the CodeWarrior development environment.
A sample project is included to make it easy for users to create AudioPlayer Skin databases.
Whichever development environments is used, the basic procedure is similar to the following steps.

(1) Prepare a bitmap based on the bitmap spec.

(2) To create the PRC files, create matrices from the bitmaps in step 1 in the proper arrangement and with the appropriate resource ID numbers.

Follow the notes below when creating AudioPlayer Skin databases.

(Notes)

- The database name should be ”AudioPlayerSkin”.
- The CreatorIDshould be ’MSAp’, the same as AudioPlayer.
- The Type should be ’skin’.

3.2 Creating with CodeWarrior® software

(1) Prepare the project

First, prepare the project in CodeWarrior application. It is recommended to use the sample project included with this document. However, if you create a new project from scratch, follow the notes in section 3.1. The amount of program code is kept to a minimum; PilotMain() in the sample project consists of a solitary return statement.

(2) Creating a bitmap

Create a bitmap resource as specified in section 2.3. If the transparent color is specified, the background image does not need to be incorporated into the bitmap. However, note that bitmaps with transparency may not be drawn correctly in cases where bitmaps are drawn over non-background bitmaps, such as when changing button states.

If you are using the included sample project, the dimensions of each bitmap matrix can be ignored, since they are set for you.

(3) Creating the version string

Specify the four-digit AudioPlayer version number in String resource #9000. The version number of the AudioPlayer Skin must match the major version number of AudioPlayer. For example, the version of AudioPlayer Skin for ver.2.X is 0002.

(4) Build

After following the above steps, save your project, and build it. The sample project will create a file named AudioPlayerSkin.prc as its output.

(5) Test

Install the generated skin in step 4 to the CLIÉ™ handheld. In AudioPlayer2.X, the new skin is loaded over the default skin automatically. If the bitmaps in the skin do not follow the requirements given in section 2.3, a fatal error may occur or the display may become corrupted.

Appendix

A.1 Compatibility

Differences between version 1.X and 2.X skins prevent them from being fully compatible with each other. The TransferAnime bitmap (#9000) may be drawn incorrectly if loading a skin made for a different version of AudioPlayer. To avoid this, separate AudioPlayer Skin databases should be created for different major versions of AudioPlayer Only the TransferAnime bitmap differs across AudioPlayer versions.

The LargeSpeaker bitmap (#5100) is required only for AudioPlayer ver.1.X.

See Table 1 for more information.

A.2 The BusyLED requirement

The BusyLEDbitmaps (BitmapFamily resource #5900) were used in early versions of AudioPlayer 2.0 but were not used in the final version. However, because AudioPlayer 2.X still checks for the existence of this resource, it must defined.