General Notice

When using this document, keep the following in mind:

1. This document is confidential. By accepting this document you acknowledge that you are bound by the terms set forth in the non-disclosure and confidentiality agreement signed separately and /in the possession of SEGA. If you have not signed such a non-disclosure agreement, please contact SEGA immediately and return this document to SEGA.

2. This document may include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new versions of the document. SEGA may make improvements and/or changes in the product(s) and/or the program(s) described in this document at any time.

3. No one is permitted to reproduce or duplicate, in any form, the whole or part of this document without SEGA'S written permission. Request for copies of this document and for technical information about SEGA products must be made to your authorized SEGA Technical Services representative.

4. No license is granted by implication or otherwise under any patents, copyrights, trademarks, or other intellectual property rights of SEGA Enterprises, Ltd., SEGA of America, Inc., or any third party.

5. Software, circuitry, and other examples described herein are meant merely to indicate the characteristics and performance of SEGA's products. SEGA assumes no responsibility for any intellectual property claims or other problems that may result from applications based on the examples describe herein.

6. It is possible that this document may contain reference to, or information about, SEGA products (development hardware/software) or services that are not provided in countries other than Japan. Such references/information must not be construed to mean that SEGA intends to provide such SEGA products or services in countries other than Japan. Any reference of a SEGA licensed product/program in this document is not intended to state or simply that you can use only SEGA's licensed products/programs. Any functionally equivalent hardware/software can be used instead.

7. SEGA will not be held responsible for any damage to the user that may result from accidents or any other reasons during operation of the user's equipment, or programs according to this document.

NOTE: A reader's comment/correction form is provided with this document. Please address comments to :

SEGA of America, Inc., Developer Technical Support (att. Evelyn Merritt)
150 Shoreline Drive, Redwood City, CA 94065

SEGA may use or distribute whatever information you supply in any way it believes appropriate without incurring any obligation to you.

SEGA Confidential

SEGA™

SEGA OF AMERICA, INC.
Consumer Products Division

SEGA Confidential

SATURN Author
User's Manual

Doc. # ST-164-062794

© 1994-95 SEGA. All Rights Reserved.

READER CORRECTION/COMMENT SHEET

Keep us updated!

If you should come across any incorrect or outdated information while reading through the attached document, or come up with any questions or comments, please let us know so that we can make the required changes in subsequent revisions. Simply fill out all information below and return this form to the Developer Technical Support Manager at the address below. Please make more copies of this form if more space is needed. Thank you.

General Information:

Your Name _____ **Phone** _____

Document number ST-164-062794 **Date** _____

Document name Saturn Author User's Manual

Corrections:

Chpt.	pg. #	Correction

Questions/comments: _____

Where to send your corrections:

Fax: (415) 802-1717
Attn: Evelyn Merritt,
Developer Technical Support

Mail: SEGA OF AMERICA
Attn: Evelyn Merritt,
Developer Technical Support
150 Shoreline Dr.
Redwood City, CA 94065

SEGA Confidential

Saturn Author
User's Manual

SEGA Confidential

1. Introduction Guide

1.1 About SaturnAuthor

The Saturn author is the authoring software that is used to combine individual units of raw data (QuickTime movie or PICT), that were created using other tools (movie editing or graphics tools), into interactive movies. Saturn authoring software greatly reduces the time required to create applications that use movies. The Saturn author is made up of the following programs.

Author Editor

Combines multiple materials together to create a scenario. Runs on a Macintosh.

Author Converter

Converts the data created by the author editor for the author player and at the same time outputs a virtual CD script file for creating CD-ROM images. Runs on an IBM PC/AT.

Author Player

Plays the movies that is based on the scenarios created by the author editor. Runs on the Saturn.

1.2 Characteristics

The Saturn author has the following characteristics:

- Adds collision frames or branch information to movies or still pictures.
- Scenarios created on the Macintosh can be run in simulations.
- Can create programless interactive movies.
- Data output from the author editor can be used in game applications.
- Compatible with Cinepak movies and MPEG movies.

SEGA Confidential

1.3 System Image

The flow of data through the Saturn authoring is shown in Figure 1.1.

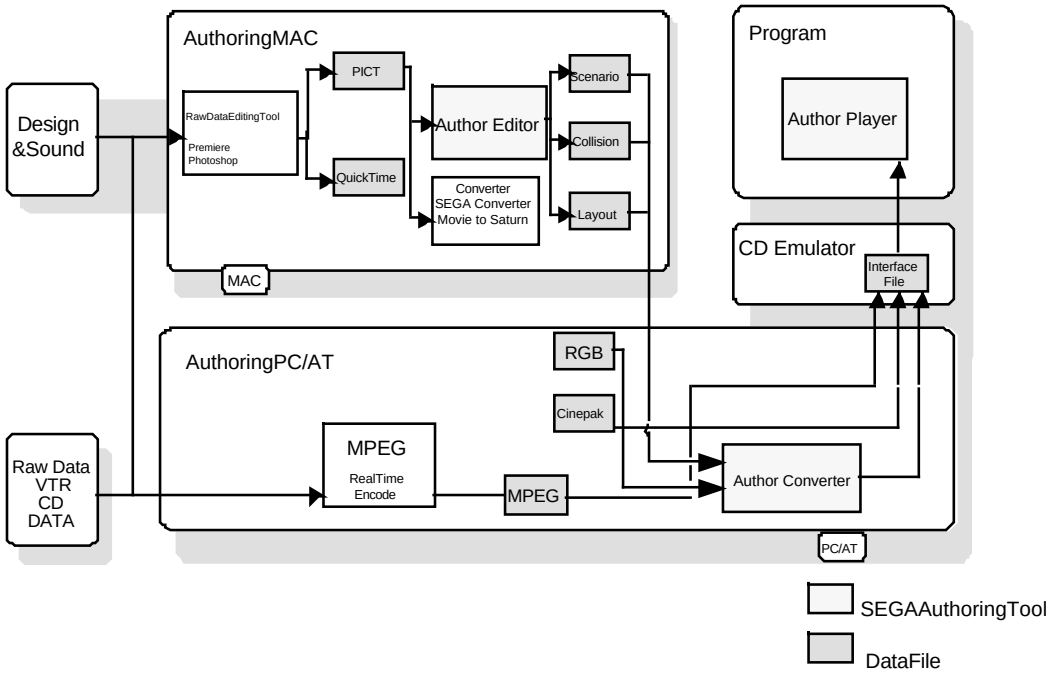


Figure 1.1 Data Flow

1.4 Environment

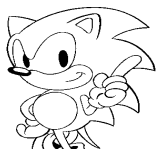
Depending on the program, the environment used will change.

Table 1.2 Environments Used with the Saturn Author

Program	Environment Required		
Author Editor	Macintosh	CPU:	68040 or higher
		RAM:	More than 32MB
		HD:	More than 1 GB
Author Converter	PC/AT or compatible	CPU:	80486 or higher
		RAM:	More than 8MB
	(Uses a virtual CD environment)	HD:	More than 1 GB
Author Player	Saturn		

The data or movie files output from the author editor are moved to the author converter PC. Because the movie files are large, the Macintosh and PC/AT must be connected by EtherNET or another network in a LAN (configuration to) send files from the Macintosh to the PC/AT. A large capacity media such as MO could also be used.

SEGA CONFIDENTIAL



1.5 Installation

The Saturn author is supplied with the following files. Because there is no particular installation program prepared, simply copy the required files to the appropriate folder or directory before using it.

- Author Editor
  File Name: AT_EDIT

  Copy AT_EDIT to an appropriate folder or directory on the Macintosh hard disk.

- Author Converter
  File Name: AT_CNV.EXE

  Copy AT_CNV.EXE to an appropriate directory on the PC/AT and set the path.

- Author Player
  File Name: AT_PLAY.ABS

  Used when creating CD-ROM images with the virtual CD.

1.6 Vocabulary Used in This Manual

Vocabulary used in this manual is explained below.

Object
Unit processed by Saturn author. Includes movies, pictures, cursors, etc.

Collision Frame
Rectangular region used to determine if a collision has occurred.

Movie
QuickTime movie. Used by Cinepak, MPEG.

Picture
Still Picture. A PICT file can be used.

Cursor
Items used by the users to operate the program. Similar to the mouse cursor used on personal computers. A picture can be used as a cursor.

Scenario
Indicates the display timing of an object.

SEGA Confidential

Event
Reason why a collision is selected. Events include pad operation and time.

Action
Process contents when a collision is selected. Includes branches, object display, etc.

Tag
Name attached to scenario time. It is the branch destination.

Branch
Move to the specified tag.

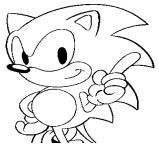
Interleave File
The file where a movie file and collision file that have been interleaved.

Interleave Definition File
Definition file used to create interleave files output by the author converter. An interleave file is created by the virtual CD by assembling this file into a script file.

Virtual CD
CD-ROM emulator for the Saturn.

Script File
Text file that defines how the CD-ROM image is created. The virtual CD translates this file and creates a CD-ROM image.

SEGA Confidential



2. Author Editor

2.1 Overview

This section explains the functions and operations of the author editor. The author editor is an editing program that can combine multiple units of raw data (QuickTime movie or PICT) to create scenarios or applications that use movies. By adding collision frames to movies or pictures, branches can be added to movies by connecting pad operation with collision frames. The scenarios created here can be emulated on the Macintosh and after conversion with the author converter (described later) can be assembled as an application by the author player.

Also, the data edited by the author editor is not just for the author player, but can also be used by game application developers in programs. Refer to Chapter 5 "Data Format" for information about the data files output by the author editor.

SEGA Confidential

2.2 System Configuration

Function Overview

Author editor functions are listed below.

- Combines multiple raw data into a single scenario.
- Can designate object display timing.
- Edits the collision frames applied to the object.
- Compliments collision frames between movie frames.
- Defines action execution contents.
- Simulates scenario and collision data.
- Outputs object and collision data interleave information (layout file).

An image of the author editor is shown in Figure 2.1.

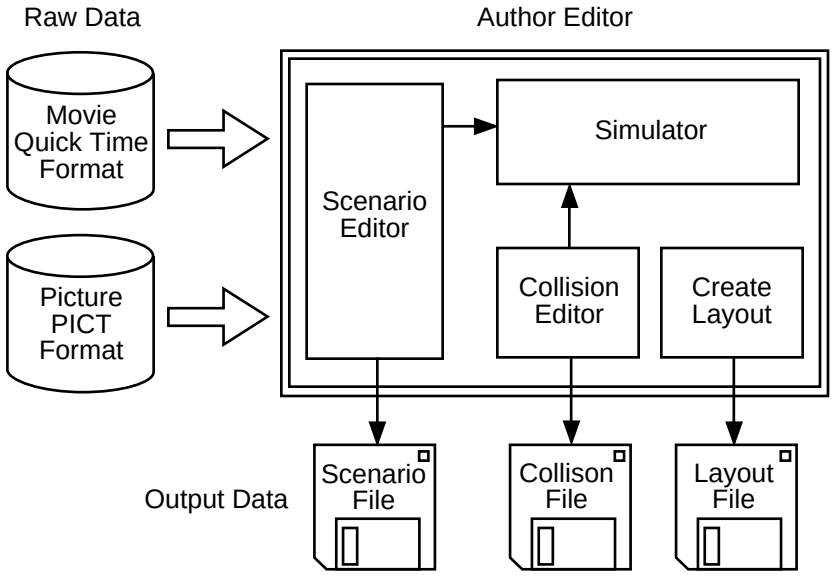
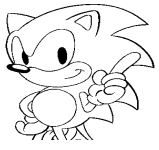


Figure 2.1 Author Editor Image

SEGA Confidential



Specifications

Specifications of the author editor are shown in Table 2.1.

Table 2.1 Author Editor Specifications

Item	Specification	Comments
Special Object	· Time · Non-display cursor	
Usable objects	· Picture (PICT) · Movie (QuickTime movie)	
Picture	· Size max320x224 · Color 32 K colors	
Movie	· Frame rate max30fps, 320x224 · Color 16M colors, 32K colors	
Total objects that can be used.	190 pieces	
Number of objects that can be displayed at the same time	· Movie 1 · Picture 32	By memory limits.
Scenario Time Axis	90 minutes	
Object Display Control	· Indicates display timing on the time axis. · Specify display coordinates.	
Collision Setting	· Movie, 1-frame units · Compliment between frame	
Collision Count	· max 50 / Frame	Total count is limited by memory.
Action Function	· Branch · Object display, non display	Can specify up to 4 branches for each collision.
Simulator	Play, Stop	PAD is assigned to the mouse or keyboard

SEGA Confidential

2.3 How To . . .

Preparation

- Objects used by the author editor (movies or pictures) are edited in advance by other tools.
- If using Cinepak movies, they are compressed by Cinepak when changing to a QuickTime movie. With MPEG, any type of compression is allowed because QuickTime is not used.
- Object files are named following MS-DOS rules with the extension for a movie being ".MOV" and a picture ".PCT". Refer to Chapter 5, "Data Format," for more details.
- All objects are placed in the same folder.

Startup and End

To start the author editor, double-click the AT_EDIT icon in the application file. The startup screen is shown in Figure 2.2. To end, select "Quit" from the file menu.

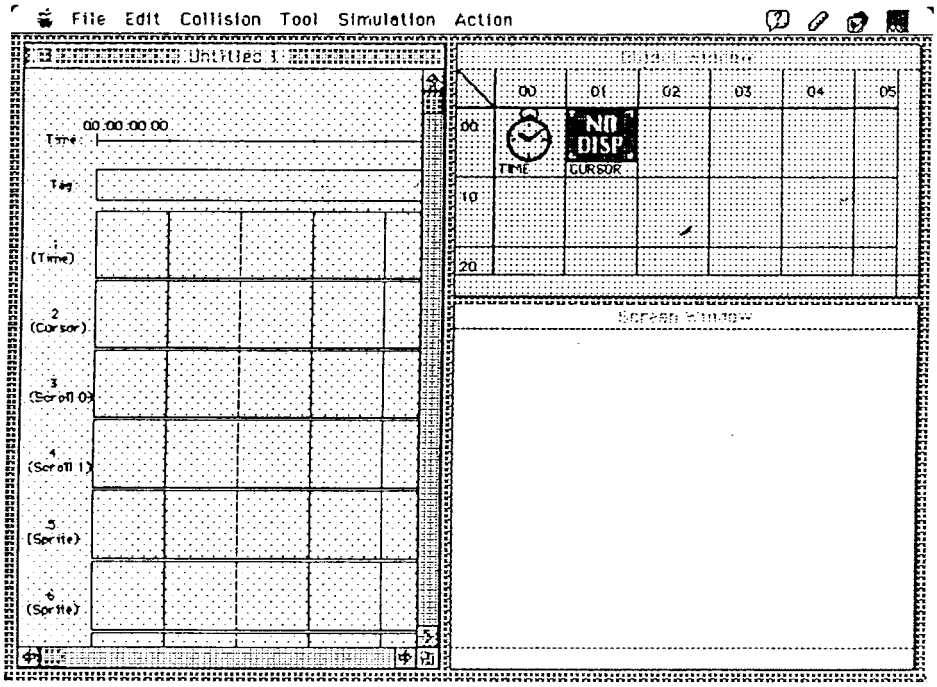
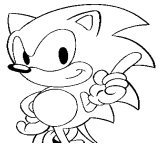


Figure 2.2 Startup Screen

SEGA Confidential



Screen Explanation

Object Window

Figure 2.3 shows the object window. The object window is an area where the object data (QuickTime movie or PICT files) that are required to create a scenario are loaded.

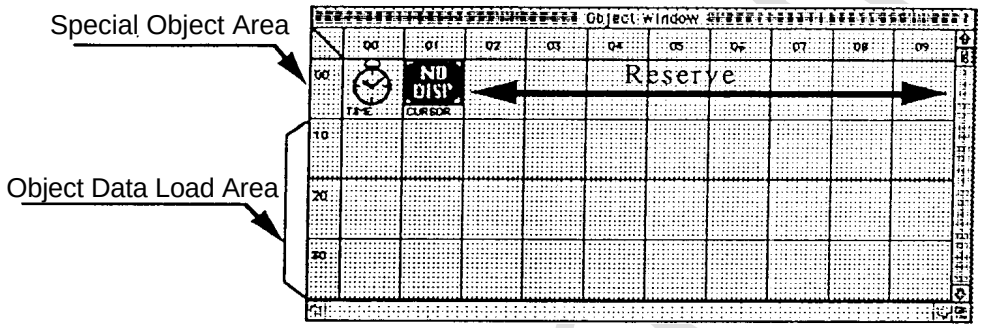


Figure 2.3 Object Window

Special Object Area

The first level of the object window is an area that contains special objects supplied with the author editor. Area 02~09 is reserved and cannot be used.

- TIME Object
  Object that generates a time-out event. It is placed in the scenario TIME object layout area and its action can be set. The action event can set the time-out, so when the time where the time-out was set is reached, a specified action takes place.
- NO DISP Object
  Object which does not display the cursor. It is placed in the scenario cursor object location and can set an action.

Object Data Load Area

Required objects are loaded by selecting "Load Object" from the file menu. Objects are loaded by the system starting at number 10 loading order. There is no particular significance in the order, but if many objects are to be loaded, it may be best to plan out the positions ahead of time.

SEGA Confidential

Scenario Window

Figure 2.4 shows the scenario window. The scenario window is used to layout special objects or registered objects on the object window, and to assemble a scenario.

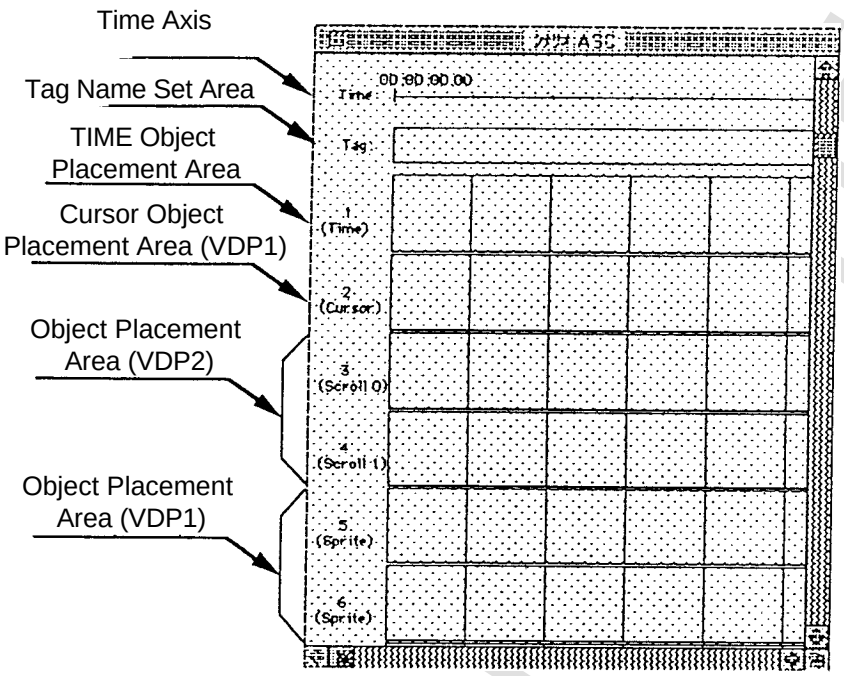


Figure 2.4 Scenario Window

Time Axis

The time access of the scenario is made up of time and frame position and is compatible to the SMPTE format.

```
SMPTE Format  00:00:00.00  (Hr : Min. : Sec . Frame Number)
```

Frame number is from 00~29. The time axis can extend to 01:29:59:29 for a maximum length of 90 minutes.

Tag Name Setting Area

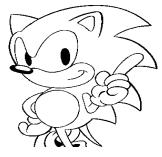
Area used to set the branch destination for when an action event occurs.

TIME Object Placement Area

This is where the TIME object in the object window is to be placed. Other objects cannot be located here.

Cursor Object Placement Area (VDP1)

The picture object and NO DISP cursor objects located in the object window can be placed in this area. Objects use the VDP1 and are displayed as sprites. Normally, a cursor made of a PICT is placed. Cursor objects can be moved up, down, left and right, by the Saturn PAD cursor keys. However, the NO DISP cursor object is not displayed so the action must be set first before being used.



SEGA Confidential

Object Placement Area (VDP2)

Movie and picture data registered in the object window are placed here. Objects are displayed using NBG0 and NBG1 on the VDP2 scroll screen. Scroll 0 (NBG0 of VDP2) can place movies or pictures. Scroll 1(NBG1 of VDP2) is set to display directly with the author player external input screen, so it is exclusive for MPEG movies.

Object Placement Area (VDP1)

Movies and pictures registered in the object window are placed here. Objects are displayed as sprites using the VDP1. Positioning is done in 32 levels (from 5~36); when picture objects displayed at the same time are different, the smaller number is displayed on the previous screen.

Screen Window

The screen window is shown in Figure 2.5. When simulating created scenarios, this window takes the place of the Saturn TV monitor.

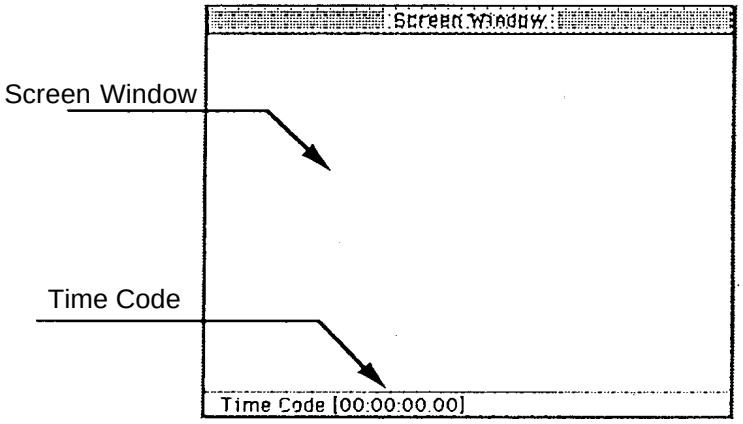


Figure 2.5 Screen Window

Screen

Displays the created scenario.

Time Code

Displays a time code corresponding to the scenario time axis.

SEGA Confidential

Collision Editor Window

Figure 2.6 shows the collision editor window. It is used to create collision frames in the object window.

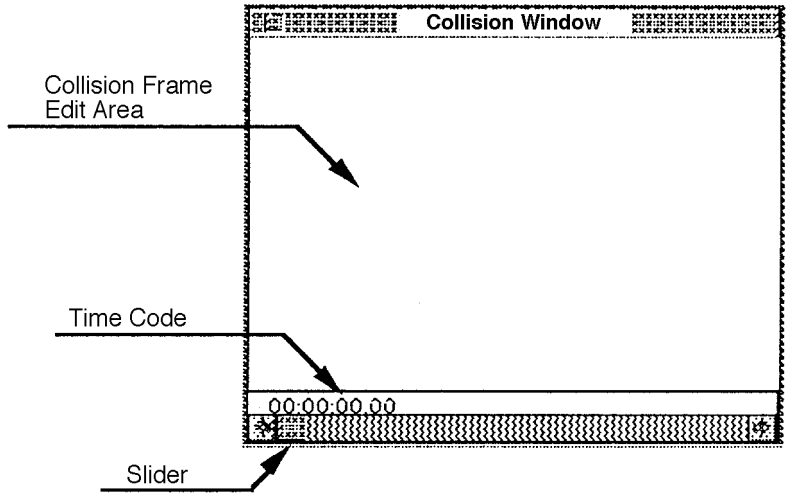


Figure 2.6 Collision Editor Window

Collision Frame Edit Area

Area used when editing a collision frame.

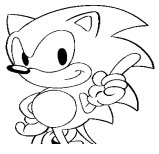
Time Code

This is the time code that shows the play frames of a movie object. If a picture object is displayed, the time code is "00:00:00.00".

Slider

Used to advance the frame position (or move back). Cannot be selected in the case of a picture object.

SEGA Confidential



Editing Procedure

The procedure for using the author editor to create a scenario is shown below. Actual procedure will differ depending on the type of work being performed.

[1] Open Object Data

First read the object data into the object window. Object data are Quicktime or PICT data files that have already been edited with the extension ".MOV" or ".PCT".

When the author editor starts up, a new scenario window is automatically opened. Next, select "Load Object" from the file menu and read the necessary files. Object data can be added and deleted while editing a scenario.

[2] Position the Object

Pastes the loaded object data into the scenario window. Activate the object window and drag the desired object to the time axis of the scenario window and drop it. There is no need to worry about correct positioning of the object. Just double-click the object and the play dialog box will open; enter the start time and play time.

[3] Set Branch Destination (Tag Setting)

Sets the tag name that sets the branch destination. To set the tag name, double-click the appropriate time axis of the tag table in the scenario window. When the tag name setting dialog box appears, enter the correct time and tag name.

[4] Create Collision Frames

Collision frames are created for object data in the object window. Select the object data in the object window with the mouse; selecting "Start Collision Editor" from the Collision Editor Menu will activate the collision editor window. Collision frames are created by using tools in the tear-off menu under the Tools menu. Collision frames can be created in both movies and pictures; frames can also fill-in between frames in movies.

[5] Set Action

The collision frame corresponds to the Saturn pad and can be used to branch off to the branch destination set in the tag. In addition, other objects in the object window can be displayed (or played) or deleted.

To set an action, open the action dialog box from the Action menu by selecting "Action". Select the desired action to correspond to the event from the dialog box.

When finished setting actions for the collision frame, select "Quit" from the Collision Editor menu to close the collision editor window.

SEGA Confidential

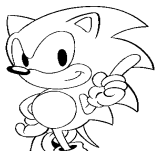
[6] Save The File

Data created in steps [1] ~ [5] is all scenario data. If a new scenario has been created, select "Save As" from the File menu and enter the file name to save. Scenario file names must have a file extension of ".ASC" according to the rules in Chapter 5, "Data Format." When editing an existing scenario whose file name need not be changed, save the file by selecting "Save." When a scenario is saved, the collision file, layout file, and environment file are all saved at the same time.

[7] Verify The Scenario

Verify the saved scenario with the simulator. Play the scenario in the simulation window by selecting "Start" from the Simulation menu. The Macintosh keyboard and mouse are used in place of the Saturn PAD.

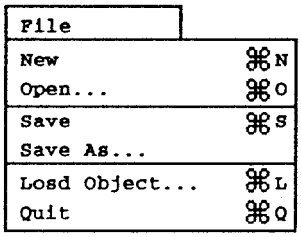
SEGA Confidential



2.4 Reference

Menu

File Menu



- New
  Select "New" and a new untitled scenario will result. If there is already a scenario being edited, a dialog box for confirming a Save will open. Untitled scenarios can be given a name using the "Save As" command. When the author editor opens, a new scenario will automatically appear.

- Open
  Select the "Open" command and a dialog box showing a list of scenario files that can be opened will appear. (Figure 2.7) When the scenario file name is opened, the layout file, collision file and environment file will also open at the same time.

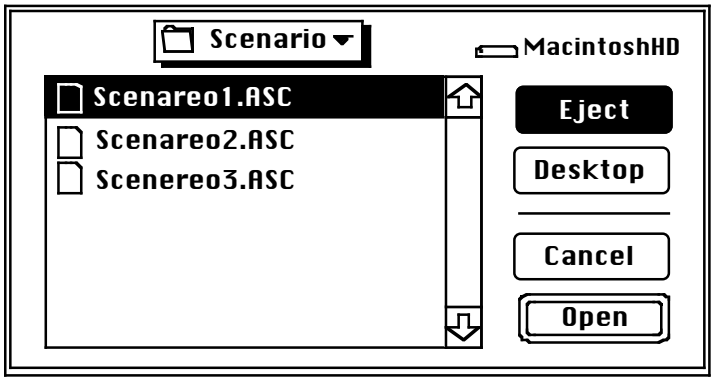


Figure 2.7 Scenario Selection Dialog

- Save
  Select "Save" to save changes in a scenario. If there is a lot of edited data, the save will take time because collision data is being converted while the layout file is being created.

SEGA Confidential

- Save As
  Select "Save As" to save a scenario file under a different name. Enter the file name into the dialog box when it appears (Figure 2.8). The scenario file name must have the file extension ".ASC", according to MS-DOS file naming rules. As in the "Save" operation, collision file conversions and layout file creation are done during the save operation. When the scenario is saved, the files in Table 2.2 are created in the same folder. See Chapter 5, "Data Format" for more information.

Table 2.2 Files Related to the Scenario

Type	File Name	Format	Comments
Scenario File	xxxxxxxx.ASC	Text	Contains objects, tags, time information, etc.
Collision File	xxxxxxxx.ACT xxxxxxxx.ACB	Text Binary	Contains collision, action, etc., information. These files are created for each object (movie, picture); the file identifier is the same as the object.
Layout File	xxxxxxxx.ALA	Text	Contains the information required to create a CD-ROM image. The file identifier is the same as the scenario.
Environment File	xxxxxxxx.ENV	Binary	Environment information used by the author editor. The file identifier is the same as the scenario.

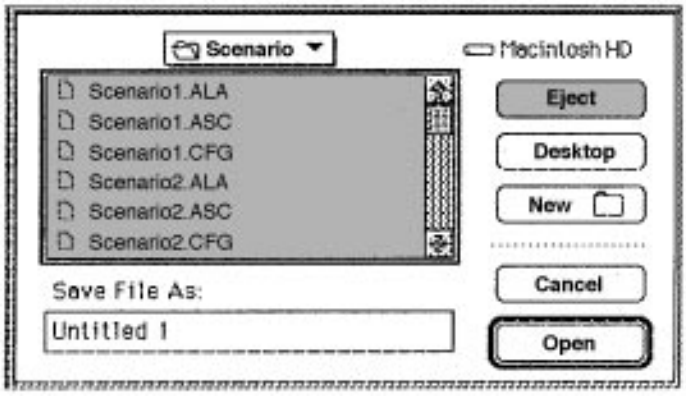
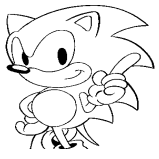


Figure 2.8 Scenario Save Dialog Box

SEGA Confidential



- Load Object
  "Load Object" is used when reading objects into the object window. Object data is a file that has already been edited and has the file extension of ".MOV" or ".PCT" for QuickTime movies and PICT files.

  Activate the object window and select "Load Object". A dialog box will be displayed showing a list of object data that can be loaded. (Figure 2.9) Select and open the necessary object data and the object image will be set into the object window starting at the 10th location. (Figure 2.10)

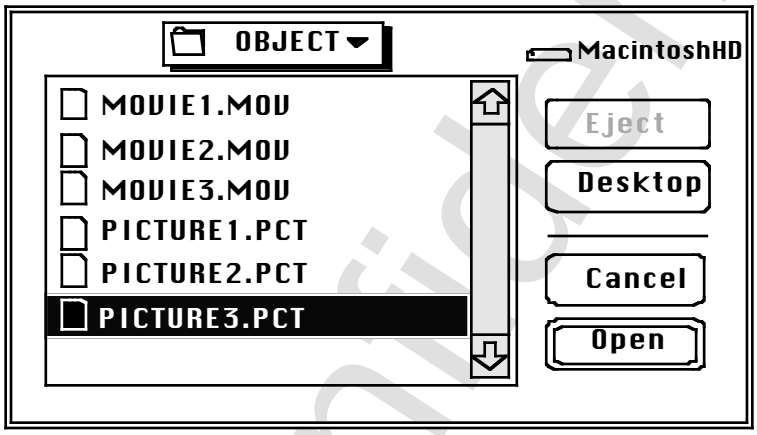


Figure 2.9 Object File Select Dialog

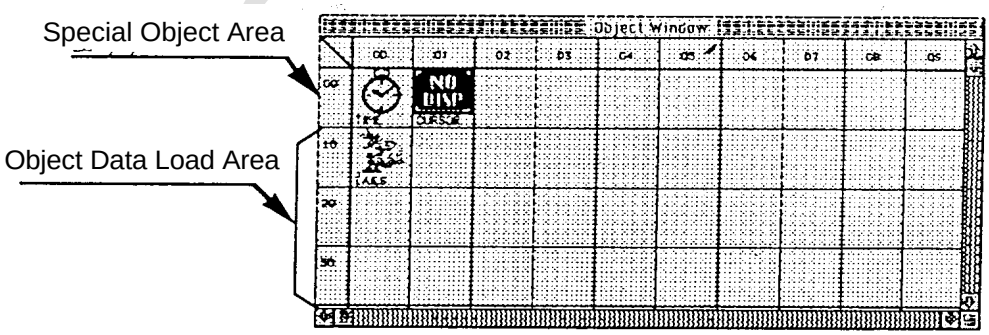


Figure 2.10 Object Window

- Quit
  Select "Quit" and the author editor will end.

SEGA Confidential

Edit Menu

The edit menu contains commands for editing object data and collision frames. When a collision frame is edited, the action set to that frame is edited at the same time. "Clear" is the only editing command that can be used for object data.

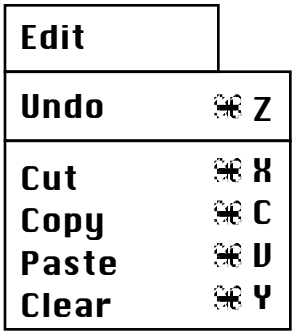
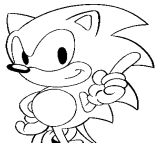


Table 2.3 Edit Menu

Edit Menu	Explanation
Undo	Used to undo the latest change to a collision frame. Use it again to undo the undo.
Cut	Deletes the selected collision frame and saves it to the paste buffer. Objects that have been cut can be pasted in a different location.
Copy	Saves the selected collision frame to the paste buffer.
Paste	Outputs the contents of the paste buffer saved by the "cut" or "copy" commands.
Clear	Deletes the selected object data or collision frame. The deleted contents are not saved to the paste buffer.

Collision Menu

SEGA Confidential



Start Collision Editor

To create collision frames, select an object from the object window and select "Start Collision Editor" from the collision menu. If a movie object is selected, the interval setting dialog box is opened, set the interval for creating collision frames. (Figure 2.11) The minimum interval setting is 1 frame; at this time collision frames can be created at intervals of 1/30 of a second. By setting the interval value to match the frame rate of the movie, a collision frame can be created for every frame of the movie.

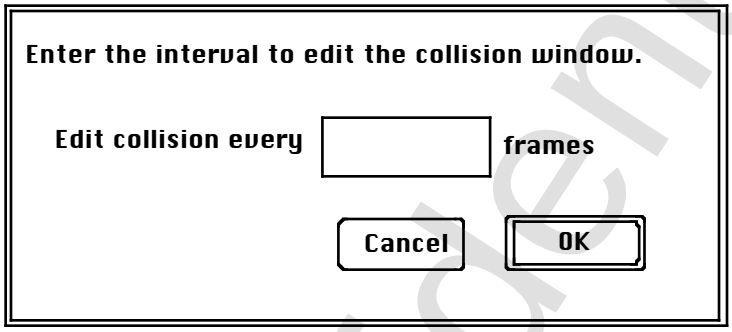


Figure 2.11 Interval Set Dialog Box

The collision editor window will open; use the Tool menu to create collision frames (see Figure 2.12).

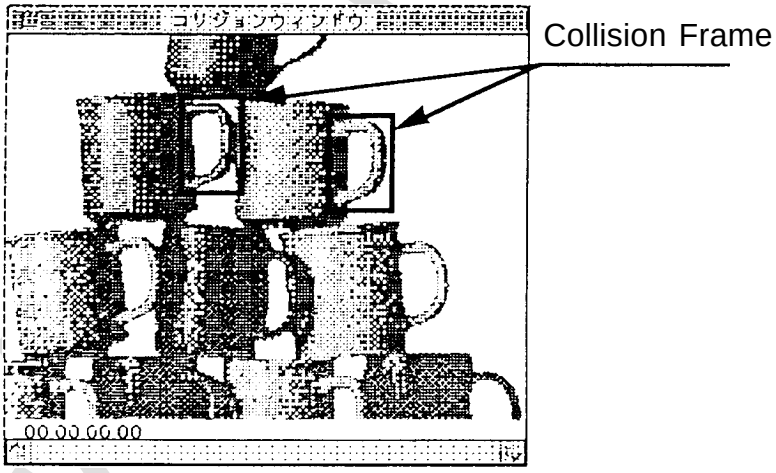


Figure 2.12 Collision Editor Window

Quit Collision Editor

After collision frames have been created for the object and the action settings are finished, select the "Quit Collision Editor" command to close the collision editor window.

SEGA Confidential

Zoom

"Zoom" is used to change the magnification of the collision editor. When open, zoom factors are 1X, 2X, 3X, 4X window sizes can be selected.

Tool Menu

The tear-off menu of the Tool menu is used to create collision frames. Drag and drop the tear-off menu somewhere near the collision editor window. Figure 2.13 shows the functions of the Tool menu.

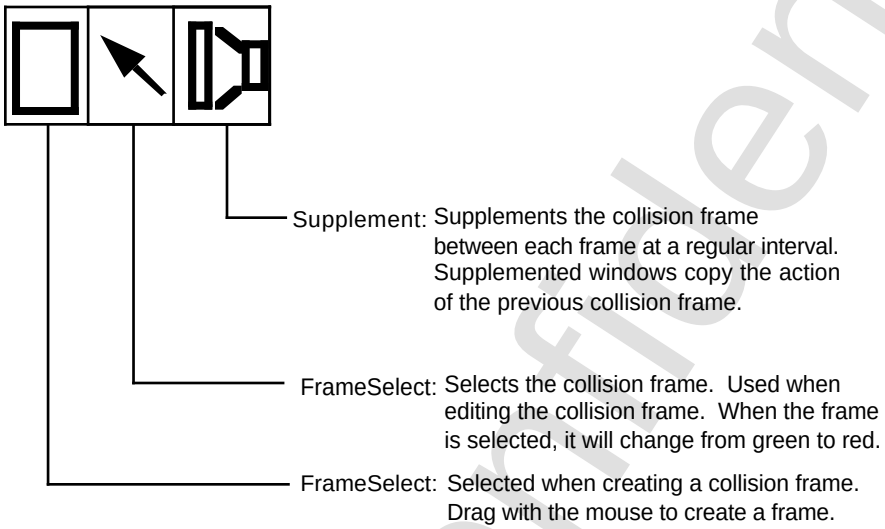


Figure 2.13 Tool Menu Functions

Collision Frame Status

Collision frames have the following two states.
Normal State: The collision frame is displayed in red.
Selected State: The collision frame is shown in green.

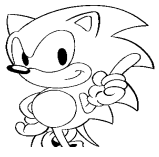
Selecting Collision Frames

Collision frames are selected and released in the following ways.
Select: Select the frame selector and click in the frame with the mouse.
Release: Select another collision frame or click the mouse in an area where a collision frame is not shown.

Collision Frame Priority

Collision frames can be stacked. The priority of collision frames are determined by the order in which they were created. In other words, the first created collision frame has the lowest priority, and frames created last have a higher priority.

SEGA Confidential



Collision Frame Information

Double-click inside the collision frame and the collision information dialog box will open (see Figure 2.14).

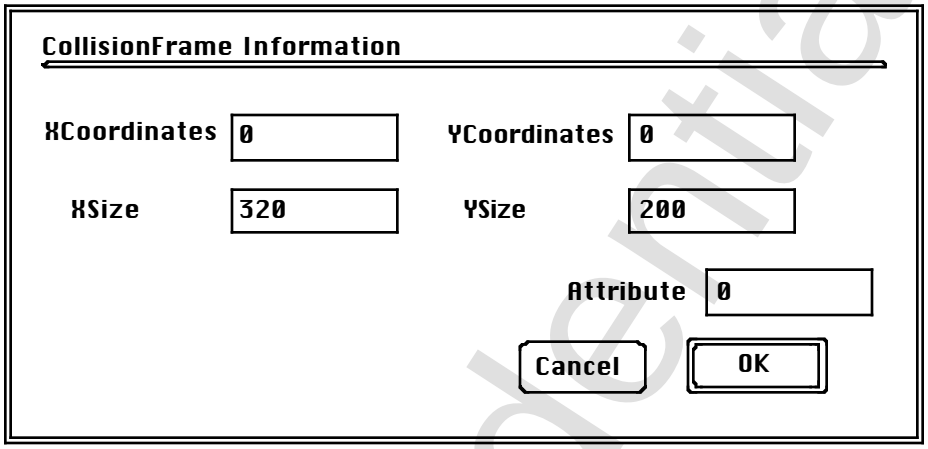


Figure 2.14 Collision Frame Information Dialog

- X Coordinates, Y Coordinates
  Information for the left frame of the collision frame; used to adjust the positioning.

- X Size, Y Size
  Collision frame size information.

- Attribute
  Cannot be used with the author player. Use when creating an application from collision data without using the author player. Setting range is -32768 ~ 32767.

SEGA Confidential

Interpolate

Once chosen, select two collision frames on different frames. All collision frames between the two are automatically complimented. At the same time, the action value set in the previous frame is also copied. The size and position of the complimented collision frame is divided at even intervals between the two specified collision frames. Figure 2.15 shows an interpolated image.

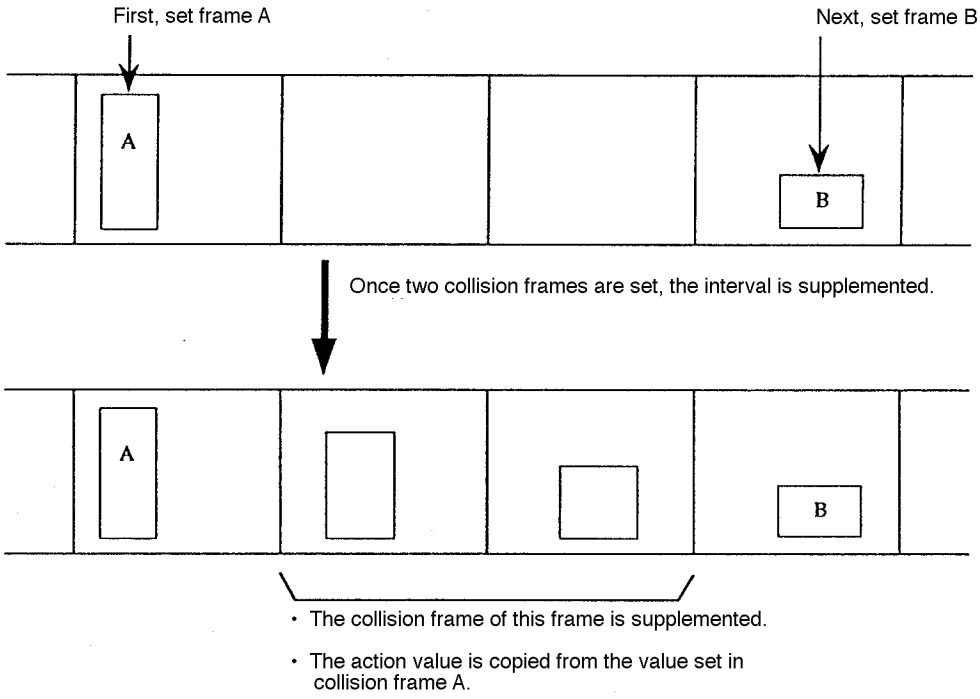
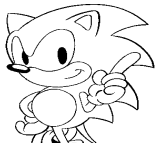


Figure 2.15 Interpolated Image Diagram

SEGA Confidential



Action Menu

Action

Action can be set for cursor objects or time objects placed within collision frames or scenarios. Select the object to be set and choose the "Action" command to display the action dialog box. Set the contents to be executed. Events that are conditions for actions are different depending on the action as shown below.

Applicable Action	Events that can be Selected
Collision Frame	A Button B Button C Button START Button
Cursor Object	A Button B Button C Button START Button Up Button Down Button Right Button Left Button
Time Object	Time-out

To set an action, select the event radio button and choose the type of action button to open a list of tag names and objects, then choose the destination of the object. Figure 2.16 shows the action dialog and Table 2.4 describes an explanation of the action buttons.

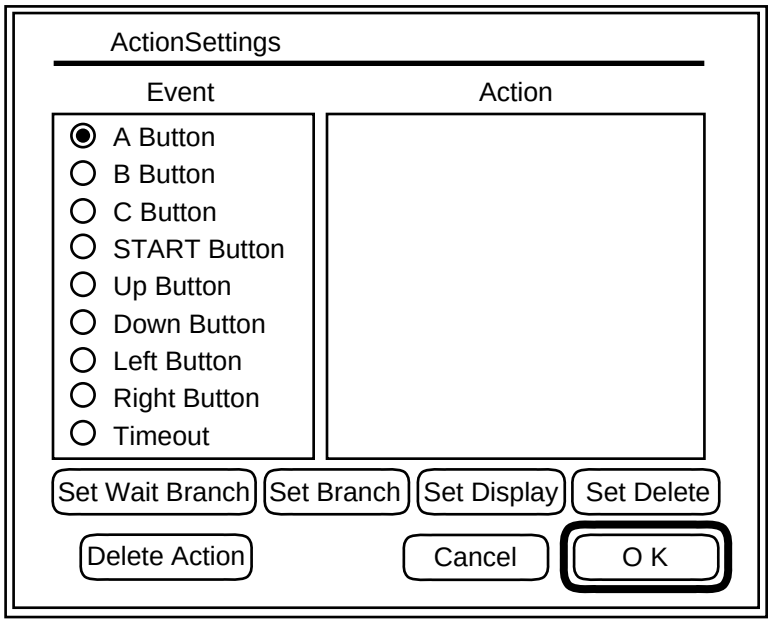


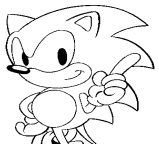
Figure 2.16 Action Setting Dialog Box

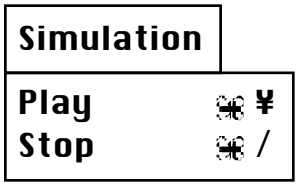
SEGA Confidential

Table 2.4 Action Buttons

Command Button	Contents	Action List
Branch Setting	Sets the branch for when an event occurs. Branches at the same time the event occurs. Press the button and a list of tags set in the scenario window will appear; select the tag name of the desired branch.	Branch (tag name)
Wait Branch Setting	Sets the branch for when an event occurs. After an event, it waits for the object to finish playing. Select the tag for the desired branch the same as in branch setting.	WaitBranch (tag name)
Display Setting	Sets the object to be displayed when the event occurs. Press the button to display a list of objects listed in the object window; select the object to be displayed.	Show (object name)
Delete Setting	Deletes the object being shown when an event occurs. Select an object from the list the same as the display setting.	Hide (object name)
Action Delete	Deletes the action set in the action list. Select the action from the list and press this button to delete.	

SEGA Confidential





Play

The simulation menu is used to verify scenarios once they are created. Select "Play" and the saved scenario will be played in the screen window. To confirm the set actions, use the Macintosh keyboard and mouse in place of the Saturn PAD. The relationship is shown below.

Saturn PAD	Macintosh Keyboard, Mouse
A Button	a or A key, mouse click
B Button	b or B key
C Button	c or C key
START Button	s or S key
Up Button	cursor key ↑
Down Button	cursor key ↓
Right Button	cursor key →
Left Button	cursor key ←

Note: The ↑, ↓, →, ← are only for action events. The cursor is moved with the mouse.

Stop

Use the "Stop" command to stop a scenario that is currently being played.

SEGA Confidential

Object Placement

To place registered object data into the scenario window:

[1] Activate the object window and select the object.

[2] Drag the selected object and the object frame will appear in the scenario window; drag the object to the appropriate time axis and drop. (Figure 2.17)

[3] Open the play dialog box by double-clicking the object.

[4] Enter in play start time and play time and any other needed items.

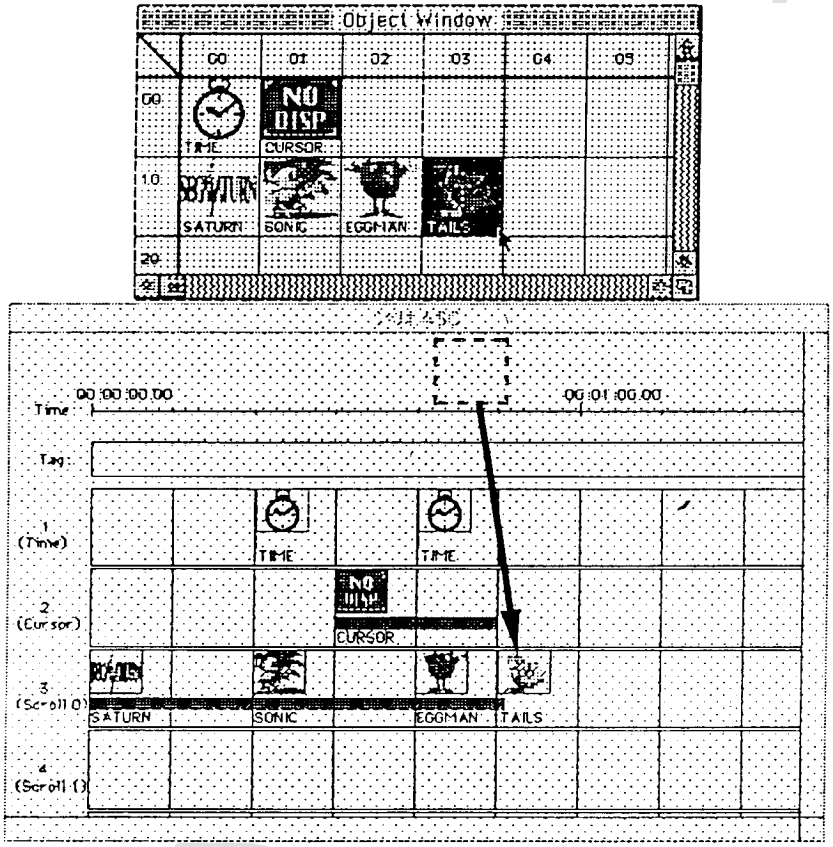
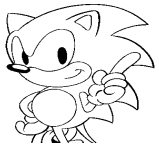


Figure 2.17 Object Layout

SEGA Confidential



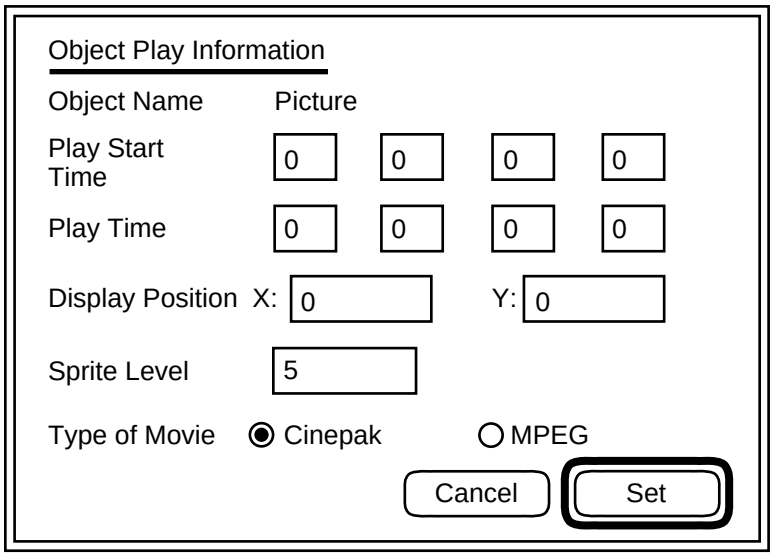


Figure 2.18 Play Information

- Play Start Time
  Play start time on the scenario time axis.

- Play Time
  Play time of that object. If it is a picture, it indicates the display time.

- Display Position
  The coordinates are upper left of the object.

- Sprite Group
  Input is allowed when an object is placed in a sprite group of the object placement area. Used when changing the sprite level.

- Movie Type
  Specifies whether the positioned movie object is Cinepak or MPEG. It is used when using the author player. If the wrong setting is entered, the author player will not play the object.

SEGA Confi

Tag Setting

To set the tag to indicate the branch destination:

[1] Double-click in the appropriate time of the tag name set area in the scenario window. (Figure 2.19)

[2] Enter the tag name when the tag name setting dialog box opens. (Figure 2.20)

[3] Enter the correct time of the branch destination.

Note: The object will not play if the start time of the object data is before the tag set time.

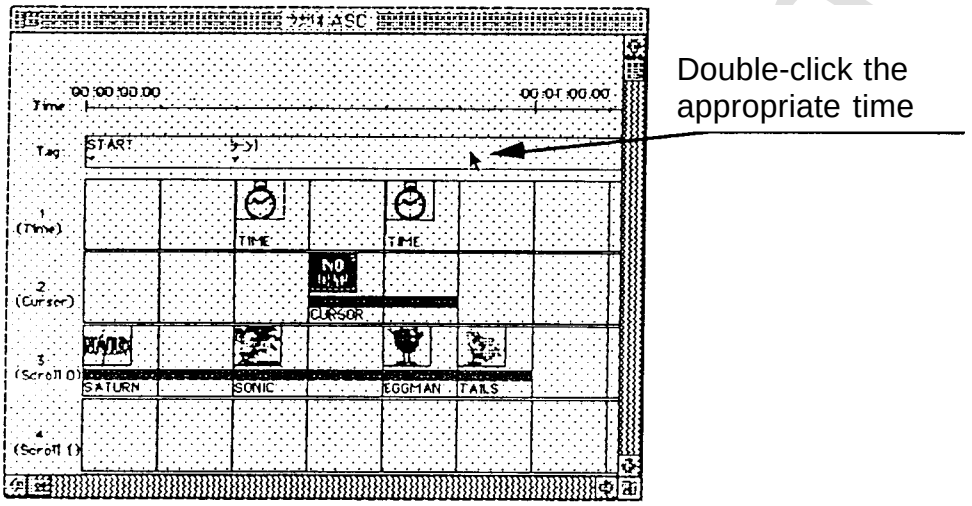


Figure 2.19 Tag Name Setting

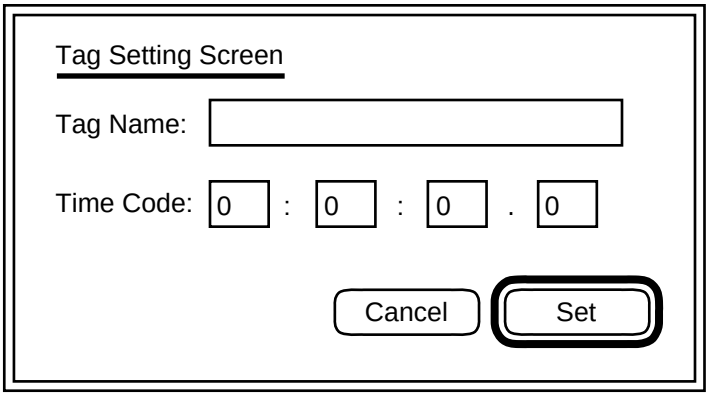
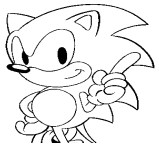


Figure 2.20 Tag Setting Dialog

SE Confidential



3. Author Converter

3.1 Overview

In this chapter, the Saturn author converter (author converter heareafter) functions and method of operation will be explained.

The author converter converts the file output by the author editor for the author player to use. See Chapter 5, "Data Format" for the types of data that can be used in the author converter.

3.2 System Configuration

Function Overview

An overview of the functions in this system is outlined below.

- Makes an animation file and a collision file into an interleave file. The actual conversion to interleave is done by the virtual CD. The author converter creates an interleave definition file.
- Outputs a script file used to create CD-ROM images. Based on this script file, the virtual CD creates a CD-ROM image.

A system image of the auto converter is shown in Figure 3.1 below.

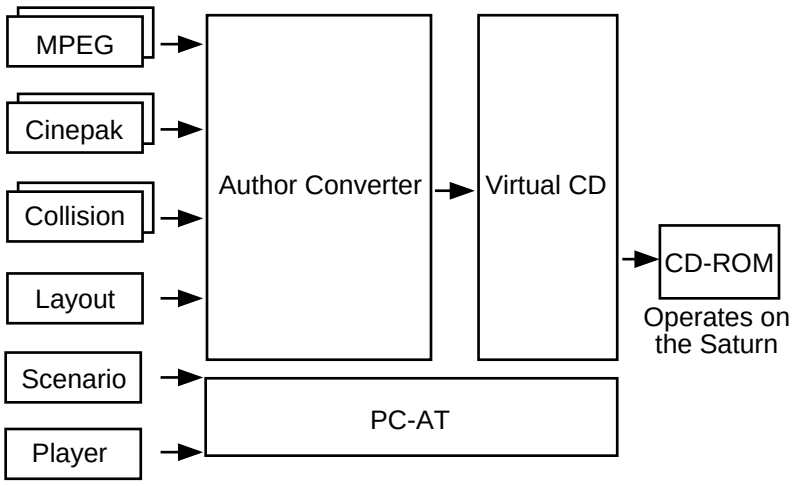


Figure 3.1 System Image

SEGA Confidential

Function Configuration

Function configuration of the Saturn author is shown in Figure 3.2 below.

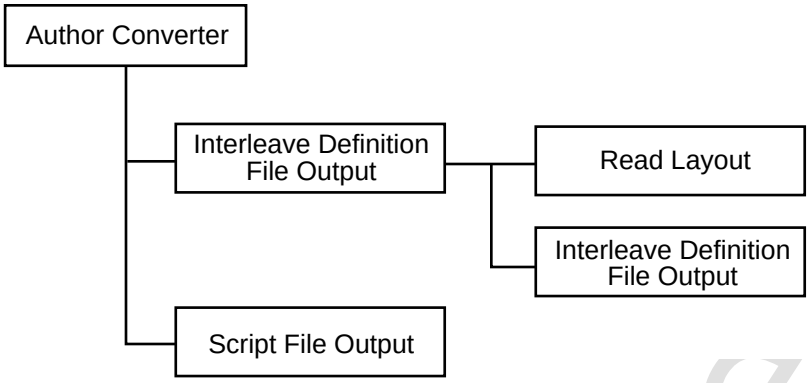


Figure 3.2 Function Configuration

The author converter consists of the following two modules.

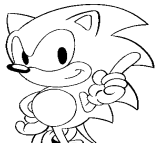
Interleave Definition File Output

Outputs a definition file used to interleave the animation file and the collision file.

Script File Output

Outputs the script file used to create CD-ROM images. When using animation files in game applications, the user must create the script file.

SEGA confidential



Date Flow

The data flow of the auto converter is shown in Figure 3.3.

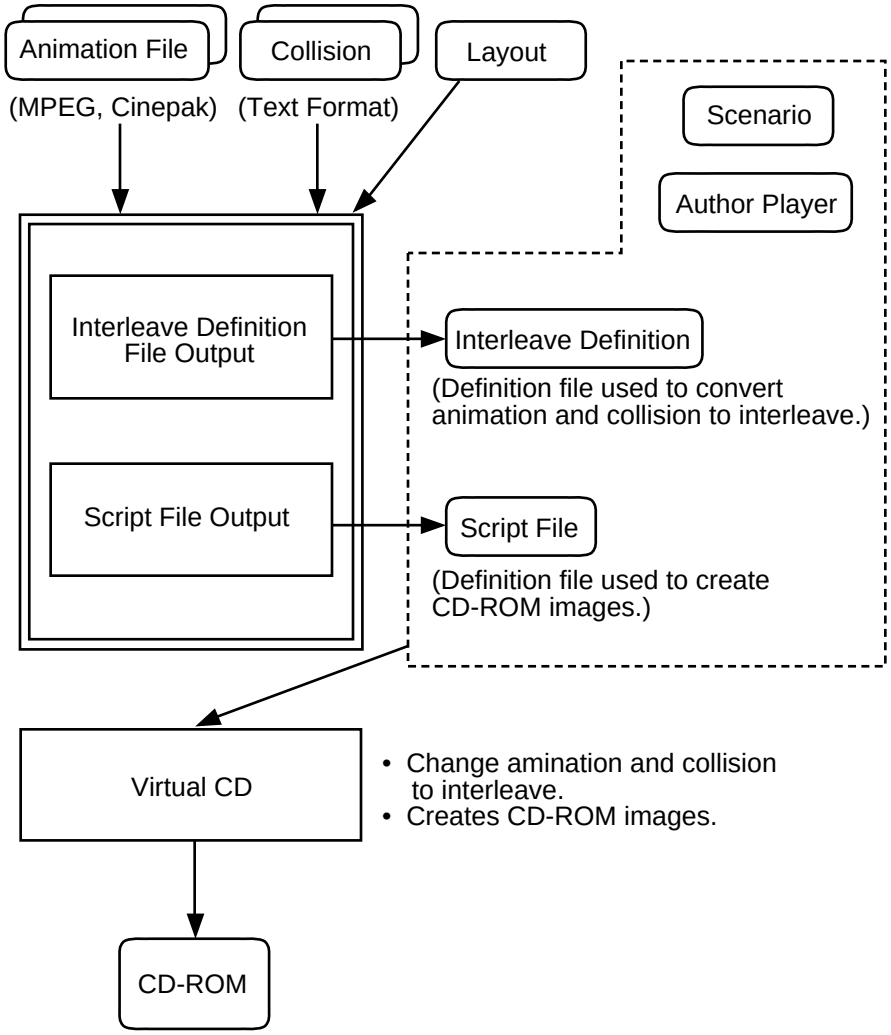


Figure 3.3 Data Flow

SEGA CONFIDENTIAL

3.3 How To . . .

Operation Procedure

The procedure for creating a CD-ROM image using the auto converter and virtual CD. (See Table 3.1 for the directory.)

1. Copy the following files created by the author editor to the IBM PC-AT. (See Table 3.1 for the directory.)
   - Scenario File
   - Collision File
   - Layout File

2. Copy a Cinepak or MPEG animation file to the IBM PC-AT. Verify that the file extension is ".CPK" for the Cinepak files and ".MPG" for the MPEG files. If a file has a different file extension, rename the file extension.

3. Execute the author converter. (See page 33, "Startup Method") The author converter executes the following conversion processed based on the animation file name and collision file name described in the layout file.
   - Outputs the Interleave Definition file.
   - Outputs the Script file.

4. When using with a game application, the user creates the script file separately. The interleave definition file output by the author converter must be incorporated into the script file.

5. The CD-ROM image is created with the virtual CD.

Note: The files used by the author converter are stored in the following directories.

Table 3.1 File Directories

File Type	File Name	Directory
Input File	Layout File Scenario File Author Player Animation File (MPEG, Cinepak) Collision File	User defined. Stored in the same directory as the layout file. ; ; ;
Output File	Interleave Definition File Script File	User defined. Saved in the same file as the interleave definition file with the extension ".AIL".

SEGA Confidential

Startup Method

Launch the program from the MS-DOS prompt.

- Format
  AT_CNV layout file name, split file name
  (Example)

```
AT_CNV CRI.ALA CRI.ASP
```

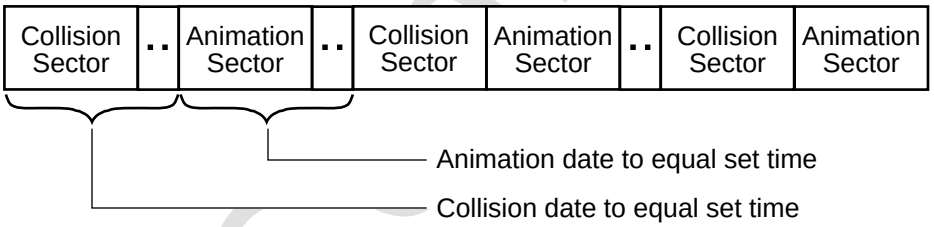
- After conversion, a VCD file is created.
  (Example)
  File that the layout file for CRI.ALA can be converted to.

```
CRI_ASP, CRI.PRE, CRI.AIL
```

3.4 Interleave File

The interleave definition file is used by including it in the script file created by the user. Virtual CD creates the CD-ROM image based on the script file. The interleave file is an alternate lineup of the collision data and animation data according to the time specified by the user.

The figure below shows the interleave method for animation files and collision data.



The collision data sectors and the animation sectors are placed in sectors with no intervening in every 2048 bytes or 2324 bytes.

Channel Number

The interleave file channel number is assigned as follows.

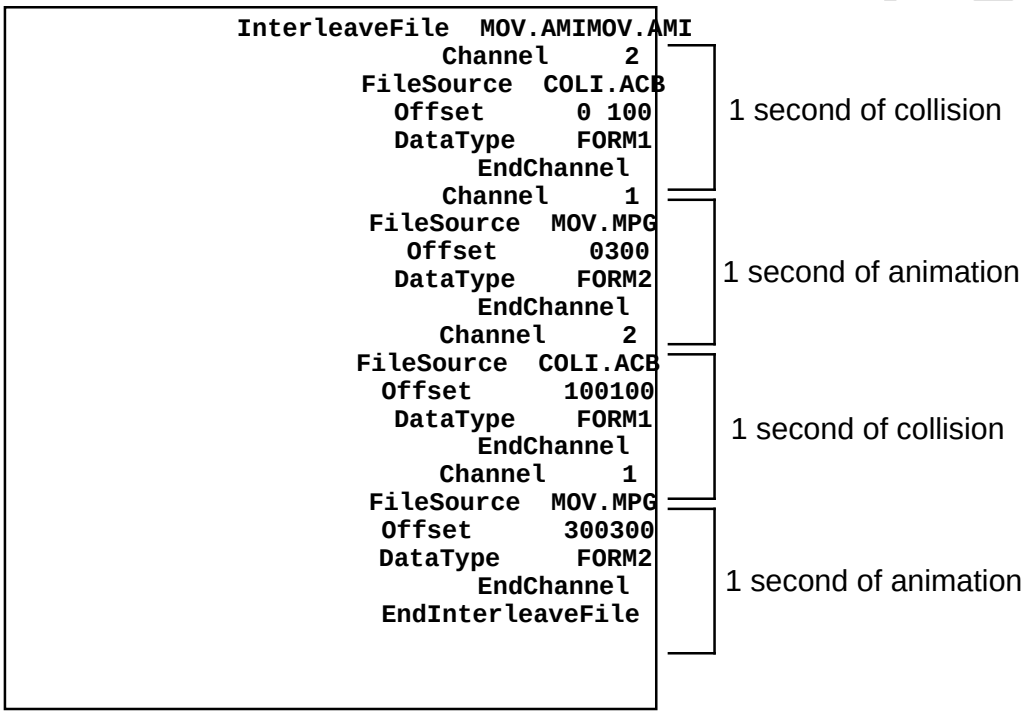
- Animation File Channel Number = 1
- Collision File Channel Number = 2

SEGA Confidential

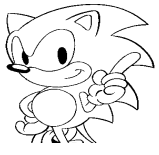
An output example of the interleave definition file is shown below.

<Example>

- In MPEG animation, the data speed is 150 KB/S and the animation file play time is 2 seconds.
- The MPEG animation file is MOV.MPG, the collision file is COLI.ACB, and the interleave file is MOV.AMI.
- Animation and collision will interleave each 1 second.



SEGA Confidential



4. Author Player

4.1 Overview

The functions of the Saturn author player is explained below. The Saturn author player will be referred to in this manual as “author player hereafter”.

The author player is a tool used to play interactive movies on the Saturn based on files created with the author editor.

4.2 System Configuration

Function Overview

The functions of this system are shown below.

- Plays interactive movies based on the scenario file and collision file created by the author editor.
- If a collision frame that has been added to a still picture or movie is selected, a separate still picture or movie is played.

The system image of the author player is shown in Figure 4.1.

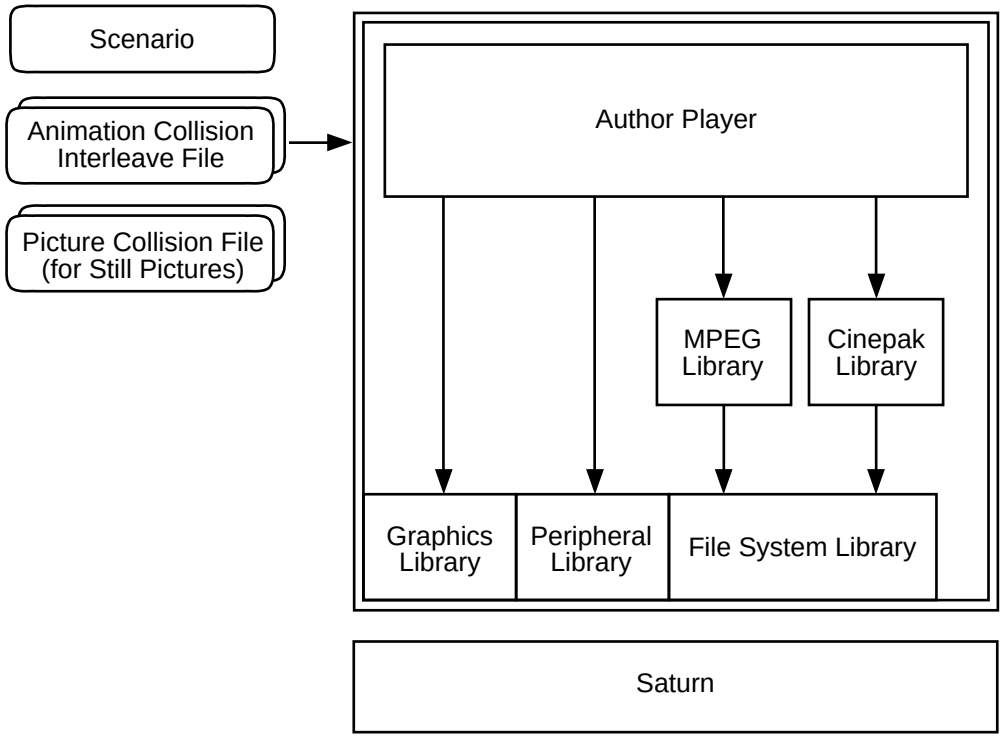


Figure 4.1 System Image

SE tidential

Function Configuration

Figure 4.2 shows the configuration of this system.

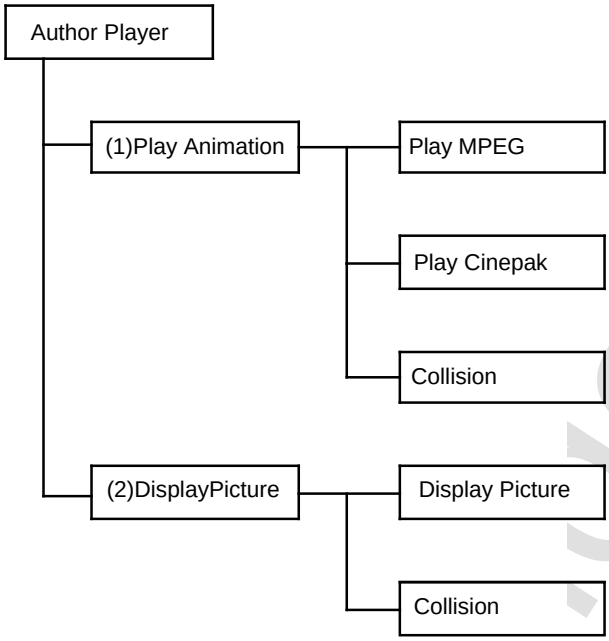


Figure 4.2 Function Configuration

The author converter consists of the following two modules.

Animation Play

Plays MPEG and Cinepak animation. Determines the collision data acquistation hits.

Picture Display

Displays one still picture (picture file). Determines collision registered in the picture file.

4.3 How To . . .

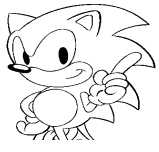
Creating Method

Prepare the following files and create a CD-ROM image with the virtual CD. See Chapter 3, "Author Converter" for details.

- Author player (File name: AT_PLAY.ABS)
- Scenario File (File name: AT_PLAY.ASC)
- Script File
- Interleave Definition File
- Animation File (MPEG or Cinepak)
- Picture File (One still picture)
- Collision File

Note: Load AT_PLAY.ABS through the CD-ROM boot module. Make sure the scenario file name is AT_PLAY.ASC.

SEGA Confidential



Application Image

Figures 4.3 and 4.4 show application images of the author player. The opening screen is shown. The cursor indicates scene 1.

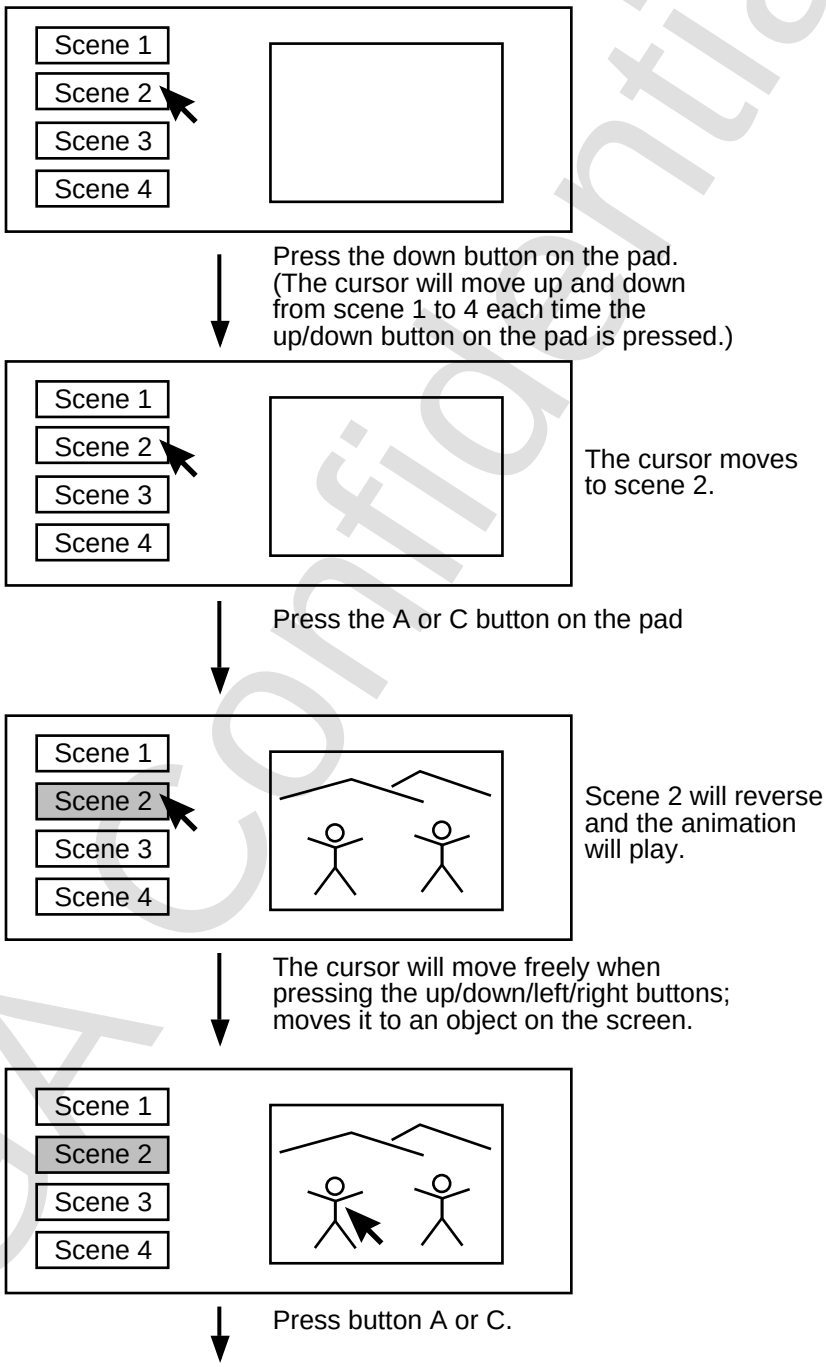


Figure 4.3 Operating Images (1)

SEGA Confidential

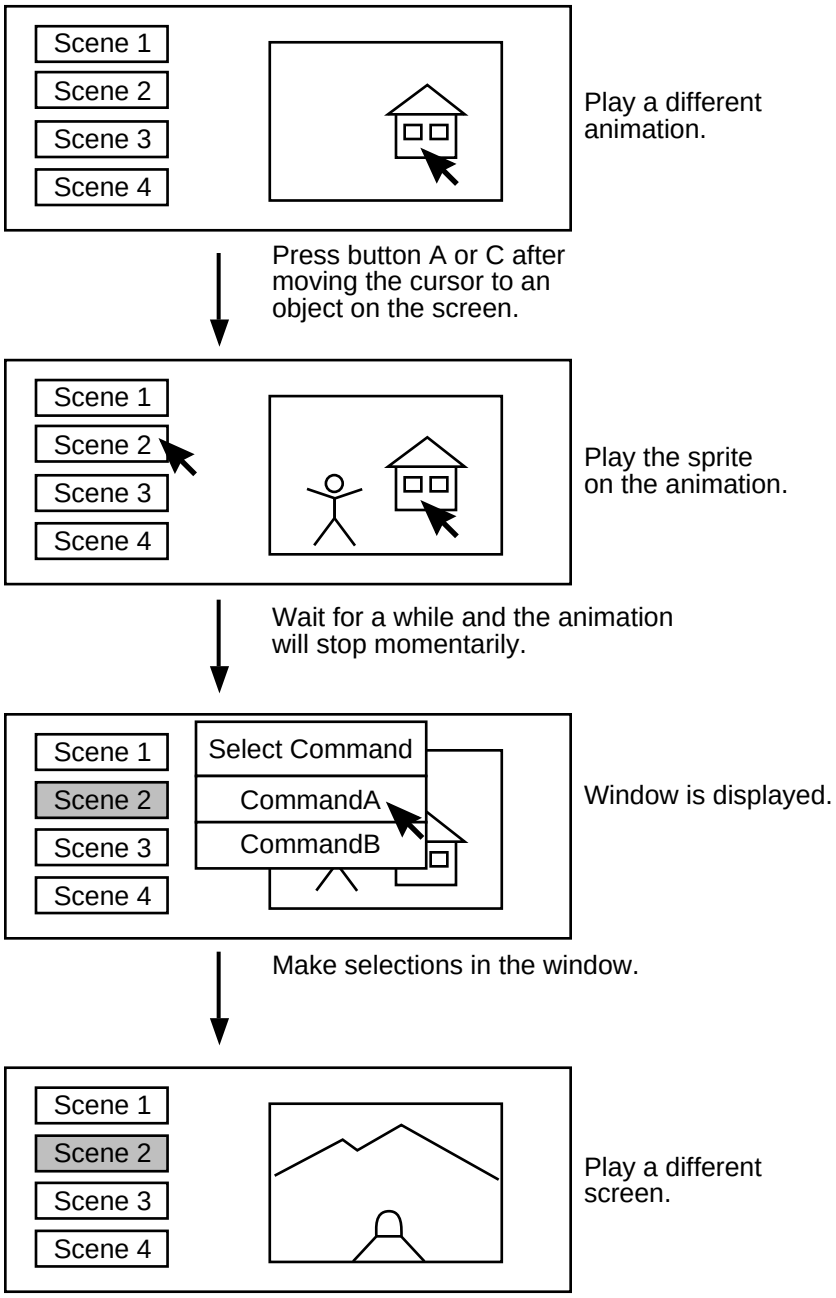
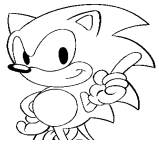


Figure 4.4 Operating Images (2)



4.4 Functions

Process Flow

Figure 4.5 shows the process flow of the author player; Figure 4.6 shows the event process flow.

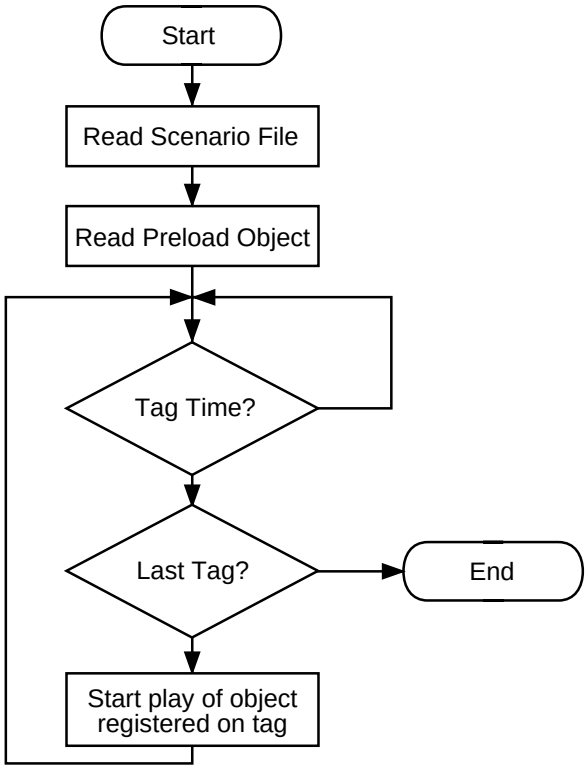


Figure 4.5 Process Flow

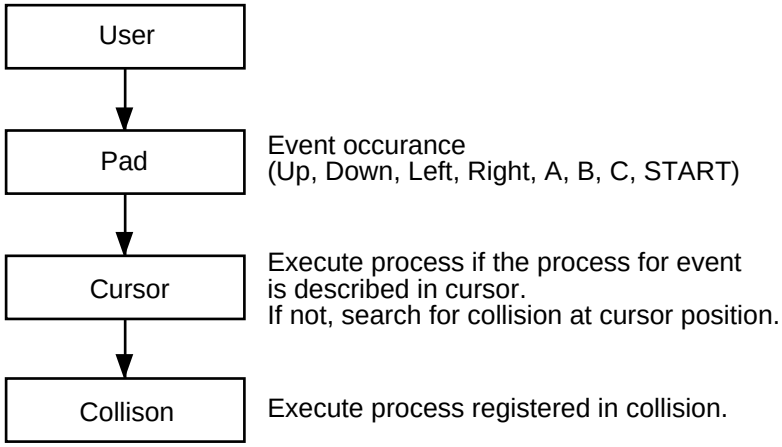


Figure 4.6 Event Process Flow

SEGA Confidential

Pre-Load

Preload is a function that loads the specified objects (pictures) from files into memory when the author player starts up.

This is used when a video is to be displayed momentarily as a response to a user action.

If objects are not preloaded, there is a time-lag while the file is read from the CD-ROM. For this reason, all objects other than videos should be preloaded to allow instantaneous display.

The number of objects that can be preloaded is limited by the Saturn RAM. The following is an approximation.

Display Size:	80x80
Display Count:	32 objects
Display Colors:	32,000 colors (RGB beta)

Screen Mode

The author player operates with the following screen modes. The screen mode cannot be changed during operation.

Table 4.1 Screen Mode

TV Screen Mode	Graphics Mode	Interlace Mode	Resolution Vertical X Horizontal (Pixels)	Cautions on Use
Normal	Normal Graphics A	Non-Interlace	320 X 224	NTSC format

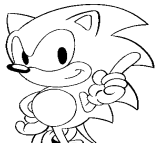
Object

The author player can display the objects shown in Table 4.2.

Table 4.2 Object Types

Object Name	Contents
Picture	Displays one picture.
Movie	Plays MPEG or Cinepak movies.
Cursor	Object that moves with PAD operation. Pictures can be specified.

SEGA Confidential



Display

Objects automatically disappear when the specified time elapses. Special Saturn sprite functions (deformation, etc.) or scroll screen control (rotate, scroll, etc.) cannot be done.

The maximum number of objects that can be displayed in the TV mode at the same time is 32. However, the display limit is based on Saturn VRAM.

Priority

The display priority is as follows.

Scroll Screen < MPEG Direct Play Screen < Sprite Screen

Collision

Collisions can be set for pictures, animation and movies.

Because collision determines if the cursor hits a frame, processing for when pad up, down, left, right, A, B, C, START buttons are pressed can be set. For example, if button A were pressed, the display could branch to a different animation.

Below is a simple explanation about each type of object.

Picture

Picture indicates how long to display a still picture.

Display Destination:	Sprite screen, scroll screen
Display Size:	
Horizontal:	8~320 (multiples of 8)
Vertical:	1~224
Display Colors:	
	32000 colors (RGB fill)

Movie

Movie plays MPEG and Cinepak. Multiple movies cannot be played at the same time.

MPEG Animation	
Destination:	Direct Screen, Sprite Screen, Scroll Screen
Size:	
Horizontal:	16~352 (multiples of 16)
Vertical:	16~240 (multiples of 16)
Colors:	
	16 million colors (On the direct screen)
	32000 colors (On the sprite screen, scroll screen)
Cinepak Animation	

SEGA Confidential

Cursor

The cursor is an object that moves with pad operation; only one can be displayed in the screen at any given time.

Operation

Table 4.3 shows the basic operation of the author player.

Table 4.3 Pad Operation

Button	Contents
Up, Down, Left, Right	Moves the cursor in the selected direction as a mouse cursor does.
A, B, C, START buttons	Executes the processing registers in the collision frame of the cursor coordinates.

Display

The cursor displays a picture created by the user on the sprite screen. If not specified, a cursor is not shown.

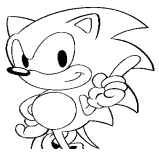
Action

Processing for events can be specified for collisions. This processing is called action. Table 4.4 shows different types of actions.

Table 4.4 Types of Actions

Action Name	Contents
Branch	Branches to the specified tag.
Object Display	Displays the specified object.
Delete Object	Deletes the specified object.

SEGA Confidential



5. Data Format

5.1 Overview

This section explains the different file formats output by the Saturn author.

Output Data File

Table 5.1 shows the data files output by the Saturn author.

Table 5.1 Files Output by the Saturn Author

Name	Explanation
Scenario File	Describes the animation and static picture file names to be displayed in a given time. Text format.
Collision File	Animation and static picture collision information, branch destinations, and display coordinate data are described. Text or binary format.
Layout File	Describes allocation information to allow real-time continuous play of the animation file. Text format. Internal file that allows data exchange between the author editor and author converter.

The text format data file consists of the command token and the set value above 0 that follows. If there are multiple settings of each value, use a tab or space to separate and set them. Tabs and spaces at the beginning are ignored.

SEGA Confidential

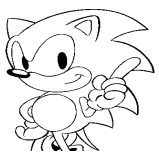
Data Files Used

Table 5.2 shows a list of data files used.

Table 5.2 List of Files used by the Saturn Author

Name	Extension	Explanation
PICT	.PCT	Static picture data file. (Macintosh standard format)
QuickTime	.MOV	Movie data file. (Macintosh standard format)
Scenario File	.ASC	Object data and time information data file. (Output by the author editor)
Collision File	.ACT	File that contains collision, action and course data. (Output by the author editor)
Layout File	.ALA	Placement information of the files on the CD. (Saturn author internal file)
Binary Collision File	.ACB	A collision file that has been conformed to an animation data format and converted to binary format. (File for the author player)
Interleave Definition File	.AIL	Definition file used to interleave an animation file and binary collision file to create a file with the virtual CD. (Virtual CD script file)
Script File	.ASP	Required when using author player. Definition file for creating a CD image with the virtual CD. (Virtual CD script file)
Startup File	.PRE	Used when starting the VCD. Startup file for the VCD pre-processing program.
Picture	.APT	Static picture data file used by the author player.
MPEG Collision Interleave File	.AMI	MPEG movie file on the Saturn. A file where a movie file and collision file are interleaved.
Cinepak Collision Interleave File	.ACI	Cinepak movie file on the Saturn. A file where a movie file and collision file are interleaved.
MPEG animation file	.MPG	MPEG animation file
Cinepak animation file	.CPK	Cinepak animation file

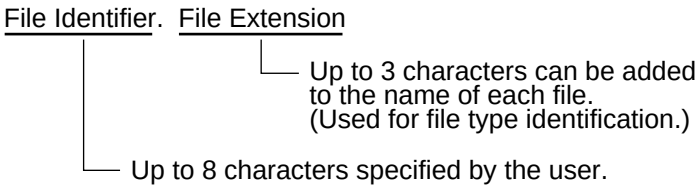
SEGA Confidential



5.2 File Names

In this section, the rules for assigning file names used by the Saturn author are explained.

The naming rules for animation files and collision data files are as shown below. Each file is saved with the same extension and in the same directory. See "5.5 File Specification" for the file format.



Data File Relationships

Figures 5.1 and 5.2 show the relationship between scenario files and collision files.

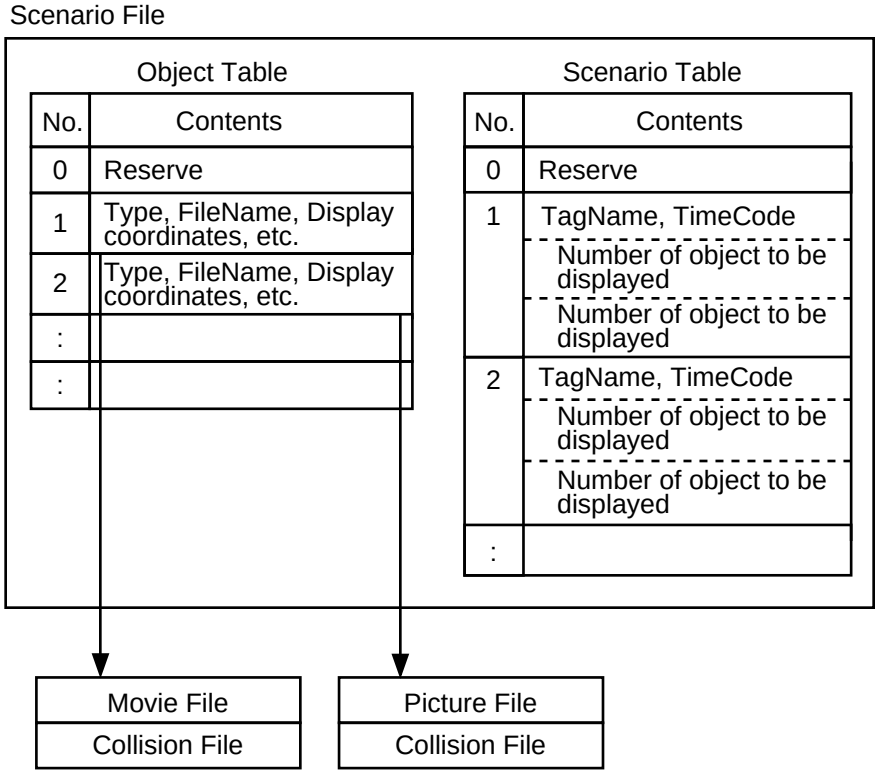


Figure 5.1 Scenario File and Collision File Relationship (1)

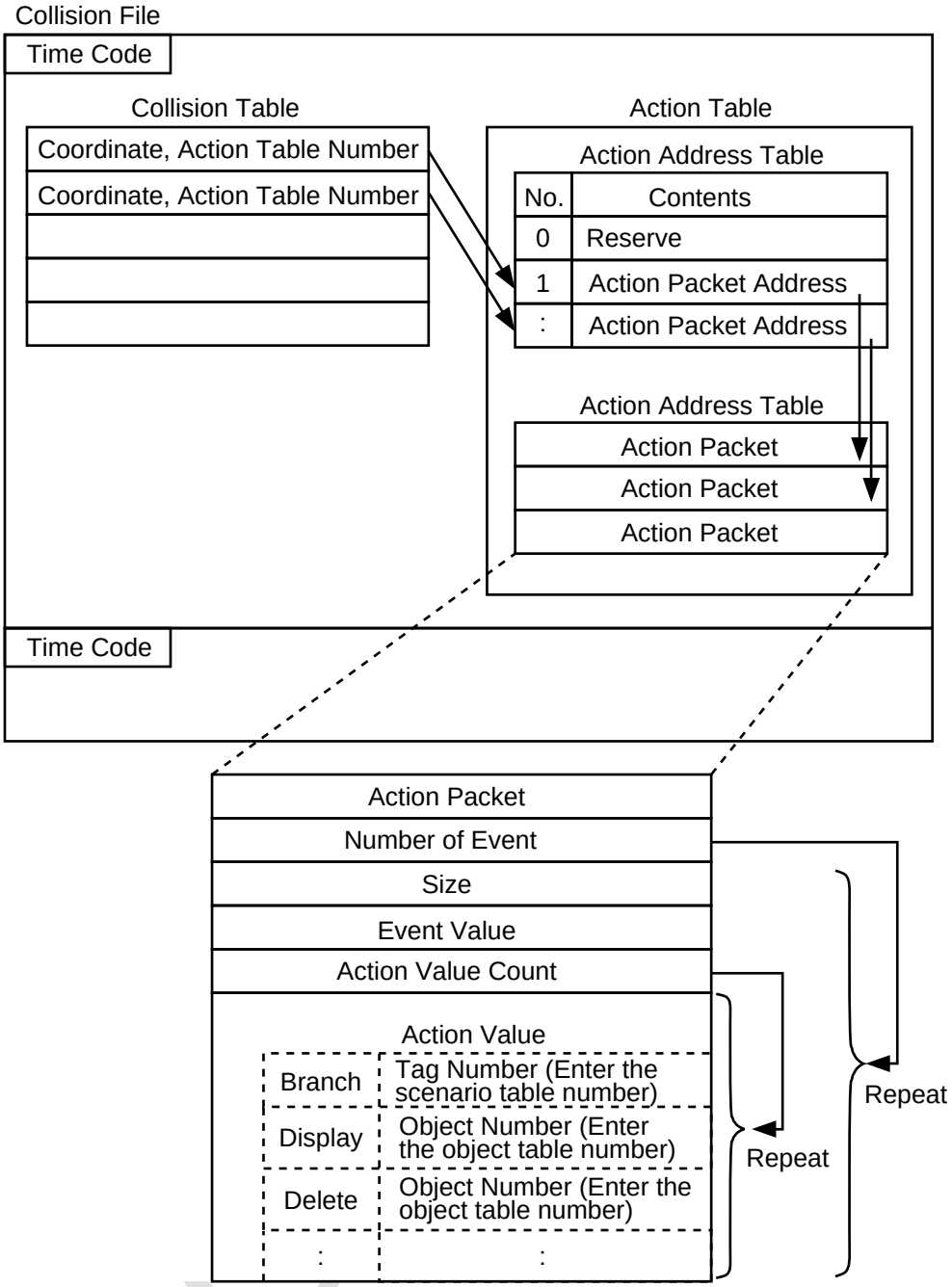
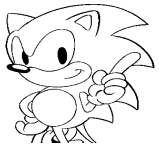


Figure 5.2 Scenario File and Collision File Relationship (2)

SEGA



5.3 Scenario File

The format of the scenario file is shown in Figure 5.3. See Table 5.3 for details on each item.

```
Format Format Name↓
Version Version Number↓
Option
   ObjectDirectory Directory Name↓
EndOption

ObjectBody Total Number of Objects bodies↓
   ObjectBodyTotal
   ObjectBodyData Object Body Number↓
      FileName File Name↓
      CollisionFrameStep Frame Interval↓
   EndObjectBodyData
      ;
EndObjectBody

Object
   ObjectTotal Total Number of Objects↓
   ObjectData Object Number, Object Type↓
       (Contents of the object goes here)
   EndObjectData
      ;
EndObject

Scenario
   TagTotal Total Number of Tags↓
   Tag  Tag Number  Time Code  Tag Name↓
   ObjectNoTotal Object Number Count↓
      ObjectNo Object Number↓
         ;
   EndTag
      ;
EndScenario
```

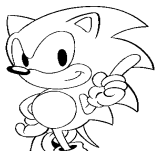
Figure 5.3 Scenario File Format

SEGA Confidential

Table 5.3 Contents of the Scenario File Items

Item	Item
Format Name	Author-Scenario goes here.
Version Number	Version number of the Saturn Author
Directory	Directory where the object is saved.
Total Object Body Count	Total object bodies in this scenario.
Object Body Number	Object body number (1~65535)
File Name	Object file name.
Frame Interval	Set collision frame interval.
Object Total Count	Total object count in this scenario.
Object Type	MOVE: Movie, PICT: Picture CRSL: Cursor, TIME: Time — *1
Object Contents	Describes the attributes of each object. See table 5.2.
———	Repeat * 1
Tag Total Count	Total tags in this scenario.
Tag Name	Tag number input by the user.
Tag Number	Tag number (1~65535)
Time code	Time information controller by the author player. H:M:S, described in frames. — * 3
Object Number	Number from the start of the object to be processed. (1~65535) — * 2
———	* 2 Repeat
———	* 3 Repeat

SEGA



Object

The object format is shown in Figures 5.4 and 5.5; see Table 5.4 for details on each item.

```
   (If Movie)
ObjectData          Object Number    Object Type↓
    Type            Type of Movie↓
    Duration        Movie Play Time↓
    ObjectBodyNo    Object Body Number↓
    Size            Movie X Size      Movie Y Size↓
    DataPos         Data X Coord.     Data Y Coord.↓
    DataSize        Data X Size       Data Y Size↓
    DispPos         Display X Coord.  Display Y Coord.↓
    DispSize        Display XSize     Display Y Size↓
    DispPlane       Display Plane↓
    Priority        Priority↓
EndObjectData

 (If Picture)
ObjectData          Object Number    Object Type↓
    Type            Type of Picture↓
    Duration        Picture Play Time↓
    ObjectBodyNo    Object Body Number↓
    Size            Picture X Size    Picture Y Size↓
    DataPos         Data X Coord.     Data Y Coord.↓
    DataSize        Data X Size       Data Y Size↓
    DispPos         Display X Coord.  Display Y Coord.↓
    DispPlane       Display Plane↓
    Priority        Priority↓
EndObjectData

 (If Cursor)
ObjectData          Object Number    Object Type↓
    Type            Type of Cursor↓
    Duration        Cursor Play Time↓
    ObjectNo        Object Number↓
    Action↓
       EventNum          Event Count↓
       ActionTotal       Total Action Count↓
       ActionData↓
          EventVal     Event Value ↓
          ActionNum    Action Count ↓
          ActionVal    Action Value ↓
             ;
       EndActionData
          ;
    EndAction↓
EndObjectData
```

Figure 5.4 Object Format (1)

SEGA Confidential

```
 (If Time)
ObjectData          Object Number    Object Type↓
    Type            Type of Time↓
    Duration        Time Play Time↓
    Action↓
       EventNum              Event number ↓
       ActionTotal        Total Action Count↓
       ActionData↓
          EventVal        Event Value↓
          ActionNum       Action Count↓
          ActionVal       Action Value↓
       EndActionData
          ;
    EndAction↓
EndObjectData
```

Figure 5.5 Object Format (2)

Table 5.4 Object Contents (1)

Item		Contents
If Movie		
	Type of Movie	0:MPEG, 1:Cinepak
	Movie Play Time	Time the movie plays. Described in Frames, Hours: Minutes: Seconds.
	Object Main Unit Number	Number of the corresponding object main unit.
	Movie X Size	Horizontal X size of the movie.
	Movie Y Size	Vertical Y size of the movie.
	Data X Coordinates	Upper left X coord. of the movie display source.
	Data Y Coordinates	Upper left Y coord. of the movie display source.
	Data X Size	Horizontal X size of the movie display source.
	Data Y Size	Vertical Y size of the movie display source.
	Display X Coordinates	Upper left X coord. of the display destination.
	Display Y Coordinates	Upper left Y coord. of the display destination.
	Display X Size	Horizontal X size of the movie destination.
	Display Y Size	Vertical Y size of the movie destination.
	Display Plane	Display destination plane number. 0: Sprite Plane, 1: Scroll Plane 2: Direct Plane
	Priority	Priority of the display and collision determination. 1 is display in front; collision determination has higher priority.

SEGA Confidential

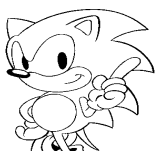


Table 5.5 Object Contents (2)

Item	Contents
If Picture	
Type of picture	0:RGB
Picture display time	Time the cursor is displayed Described in Frames, Hours:Minutes:Seconds
Object number	Number of the corresponding object
Picture X size	Horizontal size of the picture
Picture Y size	Vertical size of the picture
Data X coordinates	Upper left base display coordinate
Data Y coordinates	Lower right base display coordinate
Data X size	Original horizontal size of the picture
Data Y size	Original vertical size of the picture
Display plane number	Display destination frame number 0: Sprite plane, 1:Scroll plane
Display X coordinates	Display destination upper left X coordinate
Display Y coordinates	Display destination upper left Y coordinate
Display X size	Display destination horizontal size
DisplayYsize	Display destination vertical size
Priority	Display and collision priority 1 is display in front, collision is higher priority.
If Cursor	
Type of cursor	0: Normal
Cursor play time	Time the cursor is displayed Described in Frames, Hours:Minutes:Seconds
Number of object	Number of object to be displayed as the cursor.
Number of event	Number of Event Values
Total Number of Action	Total Number of Action Values
Event Value	Value to show the event type
Number of Action	Number of Actions
Action Value	Action value to be processed *1 *2
———	* Repeat 1
———	* Repeat 2

SEGA

Table 5.6 Object Contents (3)

Item		Contents	
If Time			
	Type of Time	0: Normal	
	Time Play back Time	Time to playback time Described in Frames, Hours:Minutes:Seconds	
	Number of Event	Number of Event Values	
	Number of Total Action	Total action values in this action	
	Event Value	Value that shows the type of event	
	Number of Action	Number of Action	
	Action Value	Action value to be processed *3	*4
	———	——— * Repeat 3	
	———	——— * Repeat 4	

Event Value

The event value is expressed in 2bytes. The data format is shown in Figure 2.1. When the bit is 1, that event is processed.

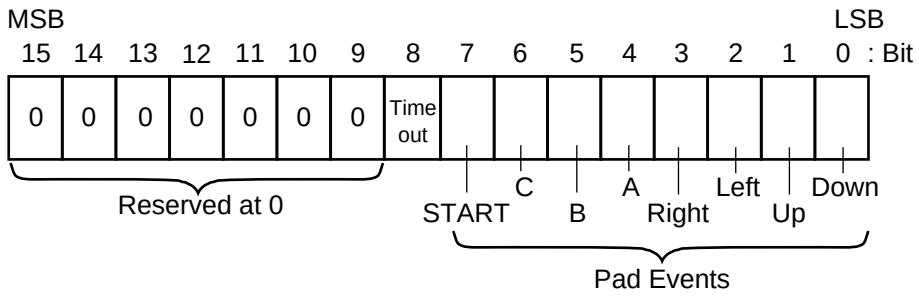


Figure 5.6 Event Value Data Format

Action Value

The action value is expressed in 4 bytes. The leading 2 bytes express the action type; the remainder expresses supplemental data.

Table 5.7 Action Value

Action Type		Supplemental Data
Value	Contents	Contents
0	Does nothing	
1	Branch to the tag number specified in attribute.	Shows the tag number (1~65535) However if 0, it does nothing
2	Branch to the indicated tag number after object has been displayed.	
10	Displays the designated object.	Shows the object number (1~65535)
11	Deletes the designated object.	Shows the object number (1~65535)

SEGA Confidential

5.4 Text Format Collision File

Collision files are created for each animation file and picture file. They contain hit determination coordinate data and processing data for when there is a hit. The format image is shown in Figure 5.7 and the format in Figure 5.8; the details of each item are shown in Table 5.8.

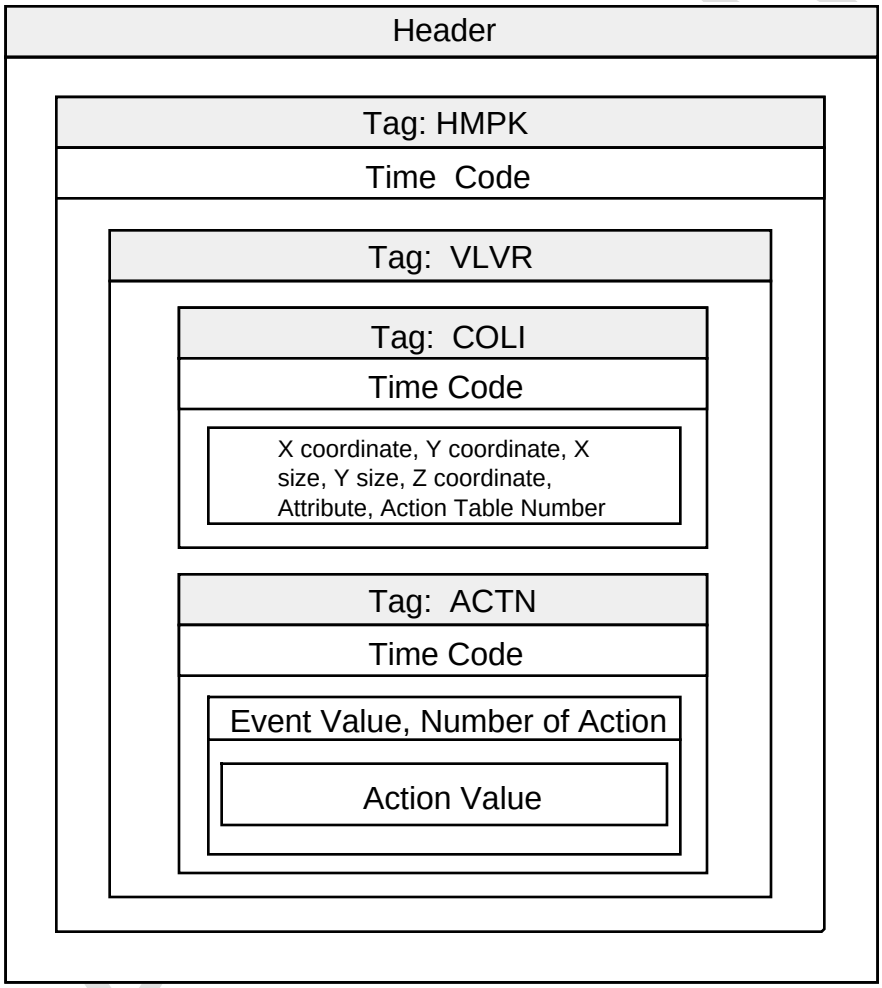


Figure 5.7 Format Image Diagram

SEGA Confidential

```
Format Format Name↓
Version Version Number↓
Tag HMPK↓
    TimeCode Time Code↓
    Tag VLVR↓
        Tag COLI↓
            TimeCode Time Code↓
            Collision↓
                Pos X Coord. Y Coord.↓
                Size X Size, Y Size↓
                PosZ Z coordinates↓
                Attribute Attribute↓
                ActionTblNo Action Table Number↓
            EndCollsion↓
                ;
        EndTag↓
        Tag ACTN↓
            TimeCode Time Code↓
            Action↓
                ActionTotal Total Number of Action↓
                ActionData↓
                    EventVal  Event Value↓
                    ActionNum Number of Action↓
                    ActionVal Action Value↓
                       ;
                EndActionData↓
                    ;
            EndAction↓
                ;
        EndTag↓
    EndTag↓
EndTag↓
    ;
```

Figure 5.8 Collision File Format

SEGA Confidential

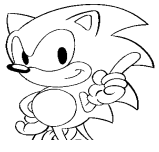


Table 5.8 Contents of Collision File Items

Item	Contents
Format Name	Enter Author-Collision
Version Number	Saturn Author Version number
Tag	HMPK: Frame Packet
Time Code Tag	Time code of the corresponding animation file Described in Frames, Hours: Minutes: Seconds
Tag	VLVR: Volatile Variable Data
If Collision	COLI: Collision, ACTN: Action
Collision count	Collision count of this time code
X coordinates	Collision frame X coordinate
Y coordinates	Collision frame Y coordinate
X size	Collision frame horizontal width
Y size	Collision frame vertical height *1
Z coordinates	Collision frame Z coordinate
Attributes value	Attribute value
Action table number	Action table number 1~65535.
	Repeat 1
If Action	
Total action count	Total number of action values in this action
Event value	Event value
Number of Action	Number of Action in this event value
Action value	Value of action being processed *2 *3 *4 *5
	* Repeat 2
	* Repeat 3
	* Repeat 4
Tag	VLFX: Volatile Fixed Length Data
	* Repeat 5

SEGA

5.5 Binary Format Collision File

The binary format collision file is created in conformity with the animation frame attribute data file. The binary format collision file format is shown in Tables 5.9~5.10.

Table 5.9 Contents of Binary Format Collision File Items (1)

Item	Bytes	Contents
Tag Name	4	HMVD
Data Size	4	Data bytes of the current tag
Time Code	4	Time code of the corresponding animation file H:M:S:Frame are each shown with one byte
Tag Name	4	VLVR
Data Size	4	Data bytes of the current tag
If Collision		
Tag Name	4	COLI
Data Size	4	Data bytes of the current tag
Time Code	4	Time code of the corresponding animation file H:M:S:Frame are each shown with one byte
Extra	4	Extra
Collision Count	2	Collision count of this time code
X coordinate	2	Collision frame X coordinate
Y coordinate	2	Collision frame Y coordinate
X size	2	Collision frame horizontal width
Y size	2	Collision frame vertical height
Z coordinate	2	Collision frame Z coordinate
Attribute value	2	Attribute value
Action table number	2	Action table number
		*1 Repeat

SEGA Confidential

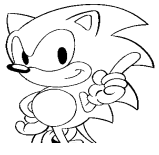


Table 5.10 Contents of Binary Format Collision File Items (2)

Item	Byte	Contents
If Action		
Tag Name	4	ACTN
Data Size	4	Data bytes of the current tag.
Time Code	4	Time code of the corrresponding animation.
		file H:M:S: Frames are shown with one byte
Extra	4	Extra
Number of Action	2	Number of action packets for this time code.
Action Packet Address	2	Offset bytes from the action table lead ----- 2
		Repeat 2
Number of Event	2	Number of Event from this action packet.
Size	2	Action value bytes registered in this event.
Event Value	2	Event value
Number of Action value	2	Number of Actions regestered in this event
Action value	4	Action value to be processed.
3	*	Repeat
4	*	Repeat
5	*	Repeat

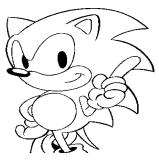
*4

*5

SEGA CONFIDENTIAL

(There is no page 58 in the original Japanese document.)

SEGA Confidential



Index

SEGA Confidential