SS-SDK Win95 Graphic Tools - ver. 1.0J

Manual and Reference (63 pages total)

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The REFERENCE info will be incorporated into on-line Help files soon. The <u>double-underlined</u> text will be cross reference links.

• Sega Confidential •

Manual

TOOL DESCRIPTIONS -

SS MONITOR: (aka SS VIEWER)

Sega Saturn Monitor is a downloader utility. It uses either 3D Editor or Map Editor to send images to a TV monitor by way of Saturn CartDev.

3D EDITOR:

Models can be positioned in 3 space on the PC using standard 3D tools. Models are positioned on the TV monitor using the Saturn controller. 3D Editor may be used with or without SS Monitor.

MAP EDITOR:

Image files can be imported and assembled as 16x16 tiles to create Maps. Map Editor may be used with or without SS Monitor. (256 color only)

INSTALL NOTES -

FROM THE DTS WEBSITE--THE ZIP FILES:

The WGT_10J.ZIP file contains the Windows95 Graphic Tools and will extract into the following 6 files: _inst32i.ex_, _setup.dll, _setup.lib, Setup.exe, Setup.ins, Sssdk.z, and WGT_MAN.pdf (Win95 Graphic Tool Manual & Reference). Also a SAMPLE directory is included which contains sample files for the 3D Editor/Map Editor.

The SDKSGIJ.ZIP file contains the Windows95 Graphic Tool Converter (for SGI) and will extract into the following sub directories: sssdk, \bin, \doc, \dso, and \sglinc

The SGL302J.ZIP file contains supercedes all previous versions of SGL and incorporates the upgrades from version 2.10a to 3.00 (Library and Sample Programs). New features in SGL 3.00: near-clipping, depth cueing, real time gouraud shading, and colored light source.

CAUTION (ZIP FILES):

When unzipping any of the above files, be sure to use an expander like WinZip 6.0a that preserves long file names. If a DOS expander is used it may truncate the file names and then they won't be found.

FROM THE DTS CD--INSTALL NOTES:

The folder NOV96.DTS/GRAPHICS/TOOL_PC/WIN95 contains: WGT_MAN.pdf, and folders; SDK_GT, SDK_SGI, jpg_sam, map_sam, sg3_sam.

Run SETUP.EXE in the SDK_GT folder to install the Windows95 Graphic Tools.

Run .INSTALL in the SDK_SGI folder to install the Windows95 Graphic Tool Converter for the SGI.

OTHER SET-UP NOTES -

The SS-SDK also contains SGL 3.01, refer to the Programming Section for this.

CAUTION (ASPI FILES):

If after installation SSMonitor does not send images to Saturn/CartDev, it may be necessary to install:

Adaptec EZ-SCSI ASPI Drivers (included with the Adaptec SCSI Master Card Kit #1542CF)

BASIC SET-UP:

Before running the 3D Editor/Map Editor/Sega converter tools, run the tool SSMonitor - this tool allows you to preview models and scroll screen data on your Saturn, you must have a CartDev hooked to the PC to use this functionality.

- Turn on Saturn/CartDev and run SSMonitor.

If SSMonitor has initialized correctly you should see the SSMonitor program come up in windows and the Saturn CartDev screen should be black with some text saying SSViewer[v0.8] across the bottom.

If this doesn't happen after 15 seconds power down the CartDev and Saturn, kill the SSMonitor task running in the background and repeat the process. Make sure the CartDev is Rev B.

If for any reason you need to re-initialize the SSMonitor, use the Load SegaViewer option (2nd button on toolbar) since this is the mode the other tools use for CartDev Saturn preview.

HOW TO USE...

To download to Saturn from either the 3D Editor or the Map Editor be sure to open SS Monitor FIRST.

HOW TO USE SS MONITOR:

The SS Monitor does not have any functionality by itself. Images may be sent to Saturn by either the 3D Editor or the Map Editor using the SS Monitor . The SS Monitor must be opened first. Then images can be sent from within 3D Editor or Map Editor.

SS Monitor Modes and Control -

By default, the SSMonitor is in OBJECT mode, the current mode is displayed in the bottom left corner of the Saturn CartDev screen. There are a total of 3 modes currently; OBJECT, SCROLL, and MOTION. (The Motion mode is not implemented yet). To cycle through the modes, press the TOP-R button on the Player 1 D-PAD. To toggle the info screen, Press the TOP-L button.

HOW TO USE 3D EDITOR:

LOADING MODELS:

- Load a SG3 file by selecting "Open..." from the "File" menu. (Example models in SG3 format are provided in the "sg3 sam" folder).

3D Editor handles these MODEL file types: OPEN... SG3SAVE... SG3 , MDL(See also 3D Editor Texture List Window file types listed below).

ORIENTING THE MODEL:

The default model that appears is a cube. Only one of the six polygons (or faces) is in view at first.

- Using three of the icons of the "Tool Box" palette, a model may be; Rotated, Translated or Scaled. To re-set the view of the model choose a view from the "Camera" Icon's pop-up menu. To save custom view choose a "New Camera" from the "Options" menu.

SELECTING POLYGONS:

- To select single or multiple polygons, in the "Model Window", select the "Select Polygons" icon (the green one) from the "Tool Box" and click on individual faces.

- To select all the polygons choose "Select All" from the "Edit" menu.

- To de-select polygons choose "Select Clear" from the "Edit" menu, (Hold down the "Control" key to de-select specific polygons).

USING TEXTURES:

- To view the "Texture List" window select "Texture List" from the "Window" menu.

- To access pre-assigned (SGT) textures for a model select "Open..." from the "Texture List" window's "File" menu.

Pre-assigned model/texture samples sets are in the folder "sg3_sam"; hover.sg3 & hover.sgt monitor.sg3 & monitor.sgt sonic3.sg3 & sonic3.sgt terrain.sg3 & terrain.sgt

- To access new (BMP or JPG) textures for a any model select "Import..." from the "Texture List" window's "File" menu.

(Hold down the "Shift" key to mouse select multiple files).

(Sample textures in BMP and JPG format are provided in the "jpg_sam" folder).

- With a polygon(s) selected, double click on a texture in the "Texture List" window to apply it to the model.

3D Editor handles these IMAGE file types (from the "Texture List" window): OPEN... SGT SAVE... SGT, TXR IMPORT... BMP, JPG EXPORT... BMP, SGL, TIF

Image files must be 256 color.

Image file dimension restrictions:Y size : 1 - 255 pixels in heightX size : multiple of 8 pixels in widthnote: loading an invalid size may cause a crash.

DOWNLOADING TO SATURN (3D EDITOR):

- Once the model and it's textures are assembled in the "Model" window they can be sent to the Saturn CartDev.

- From the "View" menu choose "Send Target" and select "Model". (Be sure the SS Monitor displays OBJECT mode on the TV screen).

- After a short pause the model should appear on the TV monitor.

- To update any changes to the texture assignments to the polygons, from the "View" menu choose "Send Target" and select "Texture".

- To update any changes to the background color or lighting, from the "View" menu choose "Send Target" and select "Scene".

Note: The orientation of the model on the TV may not match that of the PC's "Model Window". To change the orientation of the model on the TV screen use the Saturn controller.

OBJECT MODE - 3D Editor (VDP1)

Allows you to view a model loaded in 3D Editor and view it (Rotate, Translate, Scale), very useful for checking sorting problems ,etc.

Controls:

D - pad:	Rotate model
A button:	Hold and move D-pad to scale
A button:	Hold and move D-pad to translate
C button:	Hold and move D-pad to scale (fast)
Z button:	Hold and move D-pad to re-position model center
Start button:	Reset/center model on-screen

DOWNLOAD TROUBLE-SHOOTING:

When sending a model to the CartDev for preview, follow these steps to insure correct viewing.

1) Download the texture - do this after importing or re-sizing any of the textures in the texture list so any changes are correctly reflected in your models on the Saturn preview.

2) Download the model - changes in polygon attributes, including texture assignments will not be visually correct on CartDev unless you re-send the model to the target.

3) Download Scene updates the light vector/color/ambient and background color.

- If all else fails, re-send everything to the Saturn.

Some Other 3D Editor Features You Should Explore:

Attributes (Gouraud), Background Color, Camera Views, Hierarchy, Lighting, Property, Screen, and Slice.

HOW TO USE MAP EDITOR:

OPENING A "MAP":

Two scenarios are available;

- 1) opening an existing map file, or
- 2) creating a new map file and importing an image into it.

Scenario 2 will be explained; featuring "New" and "Import".

- From the "File" menu select "New..." to access a fresh workspace.

- The "New File" dialog appears, click OK. (color mode 256, map size 2x2)

The "Character Window" and the "Map Window" appear. The "Character Window" is where the individual map TILES are stored. The "Map Window" is where the assembled MAP is displayed, and later sent to the TV screen.

THE TOOL BOX:

You may also notice the "Tool Box". The functionality of the "Tool Box" differs with the active window.

Character Window Tool Box functionality: Select, Eraser, Eyedropper (Spoit). Map Window Tool Box functionality: Select, Pencil, Eraser, Eyedropper (Spoit), Tiling.

IMPORTING AN IMAGE FILE:

- From the "File" menu select "Import..." to load an image into Map Editor.

- The "Import" (Open) dialog appears, select a BMP file from the image files provided in the "map_sam" folder.

Map Editor handles these file types: (Image files must be multiples of 64 x 64 pixels in size and 256 color). OPEN... S2D SAVE... S2D, SGL (.MAP, .CEL, .PAL) IMPORT... BMP, JPG EXPORT... <none, see save>

- The "Assign Palette" dialog appears, click OK. (This assigns the new image's palette to position 0 of the 8 palette spaces available, 0-7)

The image file now appears, in a new third window.

- With the image file window still active, choose "Select All" from the "Edit" menu.

- Then choose "Copy" from the "Edit" menu.

- Click on the "Character Window" to activate it, and from the "Edit" menu choose "Paste".

The entire image should now appear in the "Character Window".

- Click anywhere in the image area of the "Character Window" to de-select the image.

The image is de-selected and the first tile is automatically repeated through-out the "Map Window". The initial bitmap image has now transformed into 16x16 tiles. The tiles in the "Character Window" are now ready to be copied to the "Map Window".

- Close the image file window.

- From the "View" menu choose "Grid".

A grid of cross-hairs appears on the "Character Window" delineating the tile boundaries. (To change the Grid color choose "Property" from the "Edit" menu).

- Use the "Selection" tool to select an area of tiles in the "Character Window", and then from the "Edit" menu choose "Copy".

- Click on the "Map Window" to activate it, and from the "Edit" menu choose "Paste".

- From the "View" menu choose "Grid".

- Click anywhere in the image area of the "Map Window" to de-select the image.

- Experiment with the various "Tool Box" tools to see their effects on the Character and Map Windows.

When editing in the "Map Window", using the PENCIL tool as a single tile brush, works well. The "Control" key will toggle Pencil and Eyedropper. Selecting and dragging of tiles seems very buggy at this time. Cut & paste works well.

DOWNLOADING TO SATURN (MAP EDITOR):

- Once the tiles and map are assembled in the "Map Window" the Map can be sent to the Saturn CartDev.

- From the "View" menu select "Send Target ... ".

- The "Send Target" dialog appears, click OK. (normal scroll)
- After a short pause the map should appear on the TV monitor.

Note: The orientation of the map on the TV may be adjusted using the Saturn controller.

MAP EDITOR CONTROLS:

SCROLL MODE - Map Editor (VDP2)

Allows you to view scroll data as either a rotational background or normal scroll screen. (For controller use be sure the SS Monitor displays SCROLL mode).

Controls: (NORMAL SCROLL MODE)

D - pad: Scroll map

Controls: (ROTATE SCROLL MODES)

- D pad: Rotate on Y-axis & translate in Z-axis
- A button: Hold and move D-pad to translate
- B button: Hold and move D-pad to rotate on Z-axis
- C button: Hold and move D-pad to translate back plane
- Start button: Reset/center map on-screen

- To update any changes to the tile assignments to the map, from the "View" menu choose "Send Target...", and click OK. (This is also the only way to reset the map position on the TV screen).

Some Other Map Editor Features You Should Explore:

Edit Palette, Property (Grid), Tiling Tool, Tile Flip, Rotate, Offset, and Sort. ("Rotate Scroll" from the "Send Target" dialog). (Open some existing map files).

MODELS AND MAPS TOGETHER -

It's simple...

After downloading a Model just run Map Editor and download a Map, or vise versa! (Just don't re-set SS Monitor in between)

Use the controller to switch between the two, and position both the model and the map on the TV screen.

TECHNICAL NOTES -

OBJECT MODE NOTES:

The preview mode runs the VDP1 in 1 cycle mode so you may see polygonal dropout if you display too many polys or have excessive amounts of Gouraud and texturing in your model(s) since VDP1 is only allowed 1 cycle to draw all your stuff. This little problem has been noted and will hopefully be fixed.

MOTION MODE NOTES:

Motion Mode not implemented yet.

CAUTION (TEXTURE LIST):

While the texture functionality allows importing of 8 bit textures, the 3D editor currently only supports 16 bit RGB textures only. All imported textures are converted to 24 bit BMP's when added to the texture list. BMP export functionality has a bug that creates invalid BMP files sometimes- use the TIF format when exporting textures (no bug).

Requests have been made to support paletted and CLUT format.

CAUTION (MAP WINDOW MAXIMIZE):

BUG: Use of Map Window's Maximize/Minimize Window Icon kills all Downloader functionality for Map Editor. (The "View" menu grays-out for good).

GOURAUD NOTES:

To enable the real-time Gouraud attribute for polygons in SGL 3.0 make sure the UseLight AND Gouraud boxes are both checked.

The UseLight option box found under Attribute->Material and Attribute->Gouraud is the same option.

SGI NOTES (HrcToSg3):

To convert a hierarchical model select all objects to be exported in Softimage in Multi-Selection mode. Select only the polygonal mesh portions of the model - you may select any NULLS, Chains and Effectors as well but the conversion tool will treat them as polygonal objects with no faces. In Softimage choose Save -> selected models and specify the name of the hrc file. Run HrcToSg3 on the HRC file.

Here's a little UNIX script to convert all HRC's in a directory to SG3 format:

#! /bin/csh
set filter = 'hrc'
set list = `ls *.\$filter`
foreach file (\$list)
hrc2sg3 -sg3rb \$file

end

3D EDITOR/SG3 SAMPLE MODEL NOTES:

a) Because some demo models use collapsed vertices to create concave quad polygons (sonic3.sg3/concave.sg3). These will not display correctly in Win95 3D Editor because the editor renders in triangles. However when the model is viewed on Saturn or with SSMonitor/Viewer they will be correct.

b) Since the SG3 model file only remembers the texture reference number in its data file, it is possible to load any SGT (texture) file and have the results applied to the currently loaded model. This is useful if you are creating multiple texture 'outfits' for characters, sort of like the multi-skin feature in quake.

c) Sometimes a vertex normal for a real-time Gouraud model is not correct (causes a dark or very bright spot in Gouraud polygon). This usually happens when quads are non-planar or concave - to fix this, rotating the vertices of the polygons affected will usually fix this problem.

d) All objects by default are rotated in the viewer around the origin which may make object manipulation difficult for objects with coordinates far from the origin.

ABOUT 3D EDITOR MODEL SAMPLES:

The models were created in Softimage. The SG3 files are the models. The SGT files are the textures.

Load a SG3 file by selecting "Open..." from 3D Editor's "File" menu. Load a SGT file by selecting "Open..." from 3D Editor's Texture List "File" menu. Load a BMP or JPG file by selecting "Import..." from 3D Editor's Texture List "File" menu.

3D EDITOR SAMPLES:

folder:

sg3_sam

concave1.sg3 (4 polygons) concave2.sg3 (10 polygons) concave3.sg3 (10 polygons) dragon.sg3 (152 polygons) fish_sub.sg3 (275 polygons) hover.sg3 (62 polygons) hover.sg3 (62 polygons) hover.sg3 (44 polygons) monitor.sg3 (44 polygons) monitor.sg3 (464 polygons) sonic3.sg3 (214 polygons) sonic3.sg3 (100 polygons) terrain.sg3 (64 polygons)

Additional 3D Editor Texture Samples (64x64)

folder: jpg_sam	
4Sands_Y.jpg 4Sands_G.jpg GDot01.jpg Green01.jpg RSand01.jpg RSand02.jpg RSand03.jpg RSand04.jpg	

Sand01.jpg Sand02.jpg Sand03.jpg Sand04.jpg

MAP EDITOR SAMPLES:

folder: map_sam

Beach.bmp (512x512) Bkgnd16.bmp (304x160) (16 color) Corona.bmp (192x192) Corona.s2d Dino.bmp (112x80) (16 color) SandBox.bmp (323x243) SatSteel.bmp (320x256) SatSteel.s2d SunSet.bmp (576x451) SunSpot.s2d

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Reference

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3D Editor

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About the 3D Editor

The **3D** Editor reads special format 3D object files, and can reference 3D models with optional orientation and sizing. It can also add attribute information such as colors and **texture maps** to polygons in the 3D model.

Also, extending texture mapping over multiple surfaces, which was a difficult operation in the Sega Saturn system, is simplified by the Auto Slice Texture function.

3D Editor File Formats

The 3D Editor handles the following file formats.

[Open]

SG3 Files

Binary files containing object (model) information.

SGT Files

Binary files containing texture information.

[Save]

SG3 Files

Binary files containing object (model) information.

SGT Files

Binary files containing texture information.

MDL Files

C language data files containing object (model) information.

TXR Files

C language data files containing texture information.

[Import]
[Export] **BMP Files** and others
Data to be used for texture mapping.
Extensible and modifiable by plug-in modules.

• ToolBox

The ToolBox is displayed in a working window. Basic operations that can be performed in the main window, such as rotation and movement of an object, and polygon selection, can be accessed using the ToolBox.





[Drag]

Rotates the whole model around three axes of rotation by moving the mouse. The center of rotation is the centerpoint of the model.

[Shift + Drag]

Rotates the whole model around one axis of rotation by moving the mouse. The rotation axis is the line of sight.

• 🖤 Move Model

[Drag]

Moves the whole model parallel to the projected side.

[Shift + Drag]

Horizontal mouse motion moves the whole model left and right (on the XY plane). Vertical mouse motion moves the whole model front and back (on the XZ plane).

• 🔀 Scale Model

[Drag]

Enlarges or reduces the whole model. The center of scaling is the centerpoint of the whole model.

Upward mouse motion reduces the size of the whole model.

Downward mouse motion enlarges the size of the whole model.



[Click (Drag)]

Selects the polygon at the click (drag) location. The selected polygon is displayed as a mesh.

When starting a drag from a location outside of any polygon, a marquee (rectangular frame with dotted outline) appears and is sized according to motion of the mouse. When finished dragging, any polygons having all of their vertices surrounded by the marquee are selected.

[Control + Click (Drag)]

Cancels polygon selection. Operation is the same as for selecting polygons.

[Shift + Click (Drag)]

Selects the whole model containing the polygon at the click (drag) location. This is mainly used to select the hierarchy of a member object.

• 🖪 Move Slice Texture

[Drag Inside] Move the texture to be used for a slice.

[Drag Control Point] Change the size of the texture to be used for a slice.

• 🖻 Select Camera

Select the default or a custom camera.

Related Item: Options Menu

• File Menu

Provides file management, such as opening and saving model files. Also allows exiting the editor.

Open

Opens a previously saved SG3 format file. If another file is already open, that file is automatically closed (*only one map can be edited at a time with the 3D Editor*).

Save

Saves the current file in SG3 format.

Save As

Saves the current file with a different name.

 $1 \sim 4$

Displays the last four most recently opened or saved files.

Exit Closes the 3D Editor.

Related Item: <u>3D Editor File Formats</u>

• Edit Menu

Use this menu to control polygon selection in the 3D Editor, and to configure the working environment.

Undo

Cancels the most recent operation. Note that not all operations can be canceled.

Cut Copy Paste Delete Not yet implemented.

Tool

Each sub-menu corresponds with a button in the <u>ToolBox</u>.

Select Model

Selects the whole model that includes the currently selected polygon.

Select Material

Selects all polygons that have the same material information as the currently selected polygon.

Select All Selects all polygons in all models.

Cancel Selection

Cancels the selection of all polygons in all models.

Properties Configures the 3D Editor environment. [Color] Specifies the colors of the display and each editing function. Background Color Specifies the background color.

Selected Polygon

Specifies the mesh color for display of selected polygons.

Transparent Color

Specifies a color to indicate transparency during texture data editing.

Custom Color Dialog

When checked, the color selection dialog displays the custom dialog to access the RGB sliders.

When not checked, the standard windows color selection dialog is used.

[Drag]

Selects a display method for a model during mouse drag operations, such as rotating and moving, in the main window. This is mainly intended to avoid problems that can result from speed differences in different development platforms.

Display as Wire Frame

Displays models as wire frames while dragging. This is generally the most comfortable method.

Display as Flat Polygon

Displays models as flat (untextured) polygons with light source calculation while dragging. This method is a little slower, but it provides a somewhat better representation of the model during dragging.

Display with All Properties

Displays models with all of their characteristics during dragging. Performance depends on material settings, but this method provides the most accurate appearance (and is the most processor intensive) while dragging.

• View Menu

Selects display of the sub windows and toolbox, and allows setting the target display to correspond with the SS Monitor/SS Viewer.

ToolBox

Displays or hides the toolbox.

Attributes

Displays or hides the Attribute window.

Hierarchy

Displays or hides the Hierarchy window.

Texture List Displays or hides the Texture List.

Target Display

Sends to and displays the current file on the target. The SS Monitor must be executed and the SS Viewer must be running before using this function. Model

Transfers the model data.

Note: This selection transfers only the texture numbers in the attribute data for each surface. Before texture map data can be applied, the actual texture data for each surface has to be transferred separately for each model.

Texture

Transfers the texture data.

Environment

Transfers environment data, such as light source direction and color, and ambient colors.

• Options Menu

Sets 3D environment properties such as the light source, projection side and cameras. Special operations on the vertices and sides are also available here.

Light Source

Sets light source direction and colors.

[Dialog box]

Direction

Move the red circle indicating the control point to specify the light source direction. Front

Selects the front hemisphere.

Back

Selects the back hemisphere.

Colors

Specify the colors of the light source and environment.

Light Source

Set the light source color.

Environment

Set the environment color.

Screen

Accesses various settings for the 3D projection side (screen).

[Dialog box]

Projection

Select the projection method for the screen.

Parallel Projection

Project to ignore depth (Z values)

Perspective

Project by *parsing* according to depth (normal selection).

View Angle

Slider

Specifies the viewing angle to the projected area. This setting is irrelevant when Parallel Projection is selected.

Select Camera

Select the default camera (at the standard viewpoint), or a custom camera (at a user specified location).

New Camera

Add a custom camera at the current viewpoint, *selected by number* on the sub-menu. When the number of an existing camera is selected, its location is replaced by the current viewpoint.

Rotate Vertex Order

Redefines the order of the vertex numbers of the currently selected polygon. This is mainly intended for changing texture mapping directions without altering the texture data. Note that there are certain cases where using this menu for a triangular polygon will result in data that is incompatible with SGL format.

90° Clockwise

Redefines the vertex order 90° clockwise relative to the front of the polygon. 90° Counterclockwise

Redefines the vertex order 90° counterclockwise relative to the front of the polygon. 180°

Redefines the vertex order 180° relative to the front of the polygon.

Reverse View

Redefines the vertex order on the normal vector of the selected polygon to face in the opposite direction. If texture has been applied, the texture flag of the attribute information is also reversed so as to maintain the appearance of the original image.

Create Gouraud Table

If real-time Gouraud (shading to calculate the light source) has been applied to the attribute information of the selected polygon, a Gouraud Table can be created so that the Gouraud shading is applied using fixed table values derived from the current color and direction of the light source (instead of recalculating).

This is mainly intended to speed real-time display of Gouraud shading (by eliminating the time needed to recalculate).

• Help Menu

Displays this Help for using the 3D Editor, and information about the 3D Editor.

Contents

Displays the Help menu contents.

About

Displays 3D Editor version information.

Editing Texture Data

File Menu Edit Menu Options Menu Slice Texture Function

• File Menu

Manage Texture File input and output.

Open

Öpens a previously saved SGT format file. If a file is already open, the texture data definitions in the file are overwritten automatically.

Save

Saves the current file in SGT format.

Save As

Saves the current file as a new file under a different name.

 $1 \sim 4$

Displays the names of the four most recently opened or saved files are displayed.

Import

Opens the 2D image file containing texture data to be used, and registers the *position* of *the* currently selected texture number in the texture window as texture data. If texture data already exists, it is overwritten.

Export

Saves texture data to a 2D image file.
[Dialog Box]
"Save"
Selects the conditions for saving texture data.
All
Saves all registered data.
Selected Texture
Saves the currently selected texture.
ID Area
Saves the texture data area specified by the texture number.

Related Items: <u>3D Editor File Formats</u>

• Edit Menu

Edits texture data, such as by cut and paste. Also displays information about the size of texture data.

Undo

Undoes the last operation. Note that some operations cannot be undone.

Cut

Cuts selected texture data. Cut data is stored on the clipboard.

Copy

Copies selected texture data. Copied data is stored on the clipboard. Note: Clipboard data is stored in DIB format, so it can be pasted to other applications.

Paste

Pastes texture data from the clipboard to the currently selected texture number location. Note: Clipboard data stored in DIB bit format can be pasted to other applications.

Delete

Erases selected texture data.

Delete All

Erases all registered texture data.

Insert

Inserts a blank texture at the selected texture number location, and rearranges the data following.

Hold the Shift key when selecting this item to maintain the relationships of texture data already applied.

Backspace

Deletes the selected texture data and rearranges the data after the selection to close space. Hold the Shift key when selecting this item to maintain the relationships of texture data already applied.

Clear Clipboard

Deletes any data stored on the clipboard.

Texture Info

Displays information about selected texture data, such as its size.

• Options Menu

Changes the direction and size of texture data. Basic operations such as cutting textures are also done here.

Invert The specified texture is inverted symmetrically about the centerline. [Dialog Box] "Invert Direction" Specifies the inversion direction. Horizontal Inverts horizontally Vertical Inverts vertically (lengthwise) "Texture to Change" Specifies the texture data to invert. **Texture Selection** Inverts the currently selected texture. Specified ID Area Inverts the texture data specified by the texture number. Rotate Rotates the specified texture. [Dialog Box] "Rotation Direction" Specifies the direction of rotation. 90 clockwise Rotates 90 clockwise 90 counterclockwise Rotates 90 counterclockwise 180 Rotates 180 "Texture to Change" Specifies the texture data to rotate. **Texture Selection** Rotates the currently selected texture. Specified ID Area Rotates the texture data specified by the texture number. Resize Changes the size of the specified texture. [Dialog Box] "Size" Specifies the desired change in size. Η Enter the desired horizontal size. V Enter the desired vertical size.

"Smooth"

When the new size is to be larger, process to remove jaggies. "200%"

Magnify by 2x, horizontally and vertically.

"50%'

Reduce by 2x, horizontally and vertically.

"Texture to Change"

Specifies the texture data to resize.

Texture Selection

Resizes the currently selected texture.

Specified ID Area

Resizes the texture data specified by the texture number.

Slice Texture Display

Displays the layers of the currently selected texture data in the main window. When the texture is displayed, the size and position can be changed freely with the <u>Move Slice</u> <u>Texture</u> tool in the main window.

Texture Slice

Based on the size and position information of the currently displayed slice texture data, new texture data is automatically created and applied to the selected polygon. Details:

Slice Texture Function

Down Up Page Down Page Up Scrolls the texture list as indicated.

Slice Texture Function

The Slice Texture function provides a projection of the selected polygon parallel to the line of sight, based on the size and position information of the currently displayed sliced texture data. Based on the relative vertex coordinate information of each projected polygon, the most suitable texture data is created to allow the image to be displayed optimally in the main window, taking into account the transformation sprite treatment by Sega Saturn. Newly created texture data is applied automatically to correspond with each polygon, and the results are immediately reflected in the attribute information.

[Dialog Box] "Size" Specifies the size of the texture data to be created. H Enter the horizontal size of the texture data. V Enter the vertical size of the texture data.

"Offset"

Select a processing method to be applied to the area around the currently displayed slice texture data.

Transparent

Process as transparent pixels.

Repeat

Repeat to process the *edge data* of the slice texture data.

Wrap Around

Fold back the slice texture data.

"Smooth"

Process sliced texture data to remove jaggies.

"Material Color"

Process using polygon colors to set the transparency pixels of the sliced texture data on each side.

"Add Position"

Specify the first number at which to position created texture data. Multiple sliced texture data are positioned in order after the texture number specified here. Existing texture data is overwritten by the created data.

Add Immediately

Position immediately after the selected texture number.

Add at End

Add to the end of registered texture data.

Specify ID

Position according to the specified texture number.

Attribute Settings

Attribute data such as colors and display methods can be set for each polygon in the model structure using the 3D Editor.

Material

Sets properties related to the material, such as the color and texture mapping of each polygon.

Mode

Sets painting method information for each polygon.

Zsort

Sets the Z-sort graph.

Gouraud

Sets Gouraud shading information.

Options

Sets optional attribute information.

Note: The attribute settings of the 3D Editor comply with the Sega Saturn VDP1 and SGL standards, so basic knowledge of those systems is required to use the attribute editing functions properly.

Material Settings

Set color and **texture mapping** information for the currently selected polygon. Settings are applied to the object polygon by clicking the Refresh button.

Polygon Draw object as a polygon. Polyline Draw object as a polyline. **Texture Map** Draw as sprites (texture map). Texture data to be applied is specified numerically. Light Source Calculate light source. Color Specify the non-texture color. Sprite ID Specify the texture data number to be applied as a texture map. H flip Display texture data reversed horizontally. V flip Display texture data reversed vertically.

Mode Settings

Set drawing method information for the currently selected polygon. Settings are applied to the object polygon by clicking the Refresh button.

Replace Displays as itself. Shadow Displays with shadow. Half Brightness Displays with half brightness. Half Transparent Displays with half transparency. Mesh Displays with mesh.

• Z-Sort Settings

Set the Z-sort base point of the currently selected polygon. Settings are applied to the object polygon by clicking the Refresh button.

Center Point The base point will be the center of the polygon. Closest Point The base point will be the front-most vertex of the polygon. Farthest Point The base point will be the rear-most vertex of the polygon.

Gouraud Settings

Set up **Gouraud Shading** settings for the currently selected polygon. Settings are applied to the object polygon by clicking the Refresh button.

Gouraud Execute Gouraud shading. Light Source Calculate the light source. Gouraud table •0 to •3 Specify the Gouraud tables for the 4 vertex values.

Note: The actual shading processes for each Gouraud setting and light source selection are as follows:

- 1) Gouraud = OFF, Light Source = OFF: Flat Color
- 2) Gouraud = OFF, Light Source = ON: Flat Shading
- 2) Gouraud = ON, Light Source = OFF: Gouraud Shading from Table
- 2) Gouraud = ON, Light Source = ON: Real-time Gouraud Shading

Options Settings

Set other option attribute information for the currently selected polygon. Settings are applied to the object polygon by clicking the Refresh button.

"Plane"

Select a method to handle *hidden surfaces*. One Side Process to show only one *side of the polygon*. Both Sides Process to show both *sides of the polygon*.

Near Clip

Force display even when the polygon changes shape near the viewpoint.

• Editing Attribute Data

Open Model File Change Model View Set Polygon Color Set Polygon Texture Set Polygon Z-Sort Flag Save Model File

• Editing Texture Data

Open Texture File Import Texture Data from 2D Image File Use Slice Texture Function Export Texture Data to 2D Image File Save Texture File

• Open Model File

To open a model file:

1) Select **File Open** from the main window.

Related Items: <u>File Menu</u> <u>3D Editor File Formats</u>

• Change Model View

To change the viewing direction of the model:

- 1) Select the **Rotate Model** tool.
- 2) Drag in the main window.
- 3) The model rotates.
- 1) Select the **Move Model** tool.
- 2) Drag in the main window.
- 3) The model moves.
- 1) Select the **Select Camera** tool.
- 2) Select the camera on the pop-up menu.
- 3) The viewpoint moves to the camera position.

Related Items: <u>Rotate Model tool</u> <u>Move Model tool</u> <u>Select Camera tool</u>

• Set Polygon Color

To set the color of a polygon:

1) Select the **Select Polygon** tool.

2) Select the polygon for which you want to set the color in the main window.

3) Select **View Attribute** to display the Attribute window (if the Attribute window is not already displayed).

4) Click on the **Material** tab of the Attribute window to activate the material setting mode.

5) Select the **Polygon** radio button.

6) Click the **Color** box to display the color setting dialog box.

7) After selecting the desired color, click OK.

8) Click the **Refresh** button.

9) The color is applied to the selected polygon.

10) Cancel the polygon selection by **Edit** Cancel Selection.

Related Items: Select Polygon tool View menu Edit menu Material Setting

• Set Polygon Texture

To set the texture of a polygon:

- 1) Select the **Select Polygon** tool.
- 2) Select the polygon for which you want to set the texture in the main window.

3) Select **View** Attribute to display the Attribute window (if the Attribute window is not already displayed).

- 4) Click on the Material tab of the Attribute window to display the material settings.
- 5) Select the **Texture Map** radio button.
- 6) Enter the desired texture number for the sprite **ID**.
- 7) Click the **Refresh** button.
- 8) The texture is applied to the selected polygon.
- 9) Cancel the polygon selection by **Edit** Cancel Selection.

Or for a simplified way to set the texture of a polygon:

1) Select the **Select Polygon** tool.

2) Select the polygon for which you want to set the texture in the main window.

3) Select **View Attribute** to display the Attribute window (if the Attribute window is not already displayed).

4) Double click inside the *display frame* of the desired texture number.

- 5) The texture is applied to the selected polygon.
- 6) Cancel the polygon selection by **Edit Cancel Selection**.

Related Items: Select Polygon tool View menu Edit menu Material Setting

• Set Polygon Z-Sort Flag

To set the Z-sort flag for a polygon:

1) Select the **Select Polygon** tool.

2) Select the polygon for which you want to set the Z-sort flag in the main window.

3) Select **View Attribute** to display the Attribute window (if the Attribute window is not already displayed).

4) Click on the **Zsort** tab of the Attribute window to activate the Zsort setting mode.

5) Select the desired radio button.

6) Click the **Refresh** button.

7) The Z-sort flag is applied to the selected polygon.

8) Cancel the polygon selection by **Edit Cancel Selection**.

Related Items: <u>Select Polygon tool</u> <u>View menu</u> <u>Edit menu</u> Z-Sort Setting

• Save Model File

To save a model file...

...in SG3 format:1) Select File Save from the main window.

... in MDL format:

1) Select **File Save As** from the main window.

2) Select **MDL Files** from the combo box.

Related Items: <u>File Menu</u> 3D Editor File Formats

• Open Texture File

To open a texture file:

1) Select **File Open** from the Texture window.

Related Items: <u>File Menu</u> 3D Editor File Formats

• Load Texture Data From 2D Image File

To load texture data from a 2D image file:

1) Select File Import from the Texture window.

Related Items: <u>File Menu</u> <u>3D Editor File Formats</u>

• Using the Texture Slice Function

To use the Texture Slice function:

- 1) Select the **Select Polygon** tool.
- 2) Select the polygon for which you want to set the texture in the main window.

3) Select **View Texture** to display the Texture window (if the window is not already displayed).

- 4) Click in the *display frame* of the texture number for the desired slice to select it.
- 5) Select **Options Texture Slice** in the Texture window to display the slice texture.
- 6) Select the Move Slice Texture tool.
- 7) Move the slice texture to the desired size and position.
- 8) Select **Options Texture Slice** in the Texture window
- 9) Set the desire slice conditions in the dialog box, and click OK.
- 10) The texture is applied to the selected polygon.
- 11) Cancel the polygon selection by **Edit Cancel Selection**.

Related Items:

Select Polygon tool Move Slice Texture tool Slice Texture function View menu Edit menu Options menu

• Save Texture Data to a 2D Image File

To save texture data to a 2D image file:

1) Select File Export from the Texture window.

Related Items: <u>File Menu</u> <u>3D Editor File Formats</u>

• Save Texture File

To save a texture file...

...in SGT format:1) Select File Save from the Texture window.

... in TXR format:

- 1) Select File Save As from the Texture window.
- 2) Select **TXR Files** from the combo box.

Related Items: <u>File Menu</u> 3D Editor File Formats

Map Editor part 1

Open New File Character Entry Edit Map Save File Open File

• Open New File

To open a new file:

1) Select File New.

Related Items: <u>File Menu</u>

• Character Entry

To enter a character:

1) Select **File Import** on the menu.

2) Select the object to be entered as a character using the **Rectangular Selection** tool in the image window.

3) Select **Edit Copy** on the menu.

4) Bring the Character window to the front.

- 5) Select Edit Paste on the menu.
- 6) Move the pasted character to the location where you want it entered.
- 7) Click the target position in the window.

Related Items: <u>File Menu</u> <u>Edit Menu</u> <u>Rectangular Selection Tool</u>

• Edit Map

To place any character on the map:

- 1) Select the **Pen** tool from the Toolbox.
- 2) Click on Desired Character in the Character window.
- 3) Drag (draw) a character on the Map window at the desired location.

To place several characters on the map:

- 1) Select the **Rectangular Selection** tool from the Toolbox.
- 2) Select the characters in the Character window.
- 3) Select **Edit Copy** on the menu.
- 4) Bring the Map window to the front.
- 5) Select Edit Paste on the menu.
- 6) Move the pasted character group to the desired location.
- 7) Click the target location in the window.

Related Items:

<u>File Menu</u> <u>Edit Menu</u> <u>Rectangular Selection tool</u> <u>Pen Tool</u>

• Save File

To save a file in S2D format:

1) Select File Save on the menu.

To save a file in SGT format:

1) Select **File Save As** on the menu.

1) Select **SGL Files** in the combo box.

Related Items: <u>File Menu</u> <u>Map Editor File Formats</u>

• Open File

To open an existing S2D file:

1) Select File Open.

Related Items:

<u>File Menu</u> Map Editor File Formats
Map Editor part 2

About Map Editor Map Editor File Formats ToolBox File Menu Edit Menu View Menu Character Menu Map Menu Window Menu Help Menu

About Map Editor

The Map Editor application reads 2D Image data files that have been saved in a standard format, and divides the picture elements into 16-by-16 pixel character units, which can then be repositioned as desired in the map area. Standards for the Map Editor character map comply with the Sega Saturn VDP2 System specification. Basic knowledge of the VDP2 System is required for effective use of the Map Editor.

Maps with the following color modes can be edited with the current version of the Map Editor.

1) 256 colors / 32,768 colors 2) 32,768 colors

• Map Editor File Formats

The following formats can be handled independently by the Map Editor:

[Read]

S2D Files

Binary files that include character map palette information.

[Save]

S2D Files

Binary files that include character map palette information.

SGL Files

C language data files that include character map palette information.

[Import]

BMP Files and others Data to be used as character objects. Can be added and modified by plug-in modules.

• ToolBox

The ToolBox displays in the working window. Basic operation such as area selection and character positioning can be performed using the ToolBox.



[Map Window] [Character Window] [Image Window] (in common) When Selecting Drag: Selects within rectangular area. After Selecting Drag: Moves the data in the selected area. Ctrl + Drag: Pastes and moves the data in the selected area. Click: Pastes the data in the selected data, and cancels the selection.

• 🖉 Pen Tool

[Map Window]

Drag:

Positions a specific character on the map.

Note: When a selection area has been set, the positioning of character data is clipped within the selected area.

Ctrl + Drag (Click)

Specifies the character at the cursor location. Acts the same as the Eyedropper tool.

```
[Character Window]
Click:
Specifies the character at the cursor location.
```

[Image Window] Not available.

• 🖉 Eraser Tool

[Map Window] Drag: Places character 0 data on the map.

[Character Window] Drag: Makes the character data at the cursor location a Space character.

[Image Window] Not available.

• Z Eyedropper Tool

[Map Window] Ctrl + Drag (Click): Specifies the character at the cursor location. Acts the same as the Pen tool.

[Character Window] Click: Specifies the character at the cursor location.

[Image Window] Not available.



[Map Window]

Drag:

Align and place character data from the clipboard.

Note: When a selection area has been set, the positioning of character data is clipped within the selected area.

[Character Window] Not available.

[Image Window] Not available.

• File Menu

Provides file management, such as opening and saving files. Also allows exiting the editor.

New

Creates a new file. [Dialog Box] Color Mode Selects the color mode for a new file.

Size

Enter the horizontal and vertical size of the new file. The units are pages, where one page is 512 x 512 pixels (32 x 32 characters).

Open

Ôpens a previously saved file. If another file is already open, that file is automatically closed. The Map Editor can edit only one file at a time.

Save

Saves the current file.

Save As

Saves the current file with a different name. When saving an <u>SGL File</u>, SGL Option flags must be set.

Related Item: <u>SGL Options</u>

Import

Opens a 2D image data file to provide character data and a display image window.

[Dialog] (Displayed in 256-color mode)

Scroll Bar

Specifies a palette to assign to the image window.

Overwrite

When checked, the color table for the image is placed on the specified palette.

1~4

Displays the last four most recently opened or saved files.

Exit

Closes the Map Editor.

• Edit Menu

Provides image editing functions such as cut and paste, and sets the Map Editor working environment.

Undo

Cancels the most recent operation. Note that not all operations can be canceled.

Cut

Cuts the selected data to the clipboard. Data cut from the Character and Map windows can be used as settings for the <u>Tile Tool</u>. Related Item: Tile Tool

Copy

Copies the selected data to the clipboard. Data copied from the Character and Map windows can be used as settings for the <u>Tile Tool</u>. Related Item: Tile Tool

Paste

Data that has been saved on the clipboard is pasted into the current working data. The pasted data can be repositioned immediately after it is pasted (floating state). The Paste function can be used between windows that hold compatible data.

Example:

Image Window Character Window

Image data pixel information can be pasted as character data.

Character Window Map Window

Character data settings can be pasted as Map information.

Delete

Erases the data in the selected area.

Select All

Selects the whole current window.

Cancel Selection

Cancels all selections in the current window. Floating data is placed at its current location.

Tool

Each sub-menu corresponds with a button in the <u>ToolBox</u>. Related Item: <u>ToolBox</u>

Properties

Sets up the Map Editor environment. [Grid Color] Map Window Specifies the grid color of the Map window. Character Window Specifies the grid color of the Character window. Image Window Specifies the grid color of the Image window.

• View Menu

Changes display magnification of the current working window, selects display/nondisplay of the toolbox, and allows setting the target display to correspond with the SS Monitor/SS Viewer.

Magnification

Displays the current working window with the specified magnification.

Grid

Displays/hides the character-unit grid in the current working window. Also displays the 1-Mb bank-unit grille in the Character window, and the page-unit grille in the Map window.

ToolBox

Displays or hides the toolbox.

Target Display

Displays the current file on the target. The SS Monitor must be booted and the SS Viewer executed before using this function.

[Dialog Box]

Scroll Type

Select a scroll type for the display.

Normal Scroll

Displays with normal scroll. The top and bottom, and left and right edges of the map are linked to wrap around.

1 x 1 Rotation Scroll

The first 1 x 1 plane unit map *constitutes the floor*, and the next 1 x 1 plane unit map *displays the rotation scroll screen that constitutes the sky*. The floor can be rotated about 3 axes.

4 x 4 Rotation Scroll

The first 4 x 4 plane unit map *constitutes the floor*, and the next 1 x 1 plane unit map *displays the rotation scroll screen that constitutes the sky*. The floor can be rotated about 3 axes.

Screen Overtreatment

Select display treatment outside of the area (in 4 x 4 plane units) of the rotation scroll that constitutes the floor side.

Transparent

Displays the outer area as transparent.

Repeat

Repeats the display area map in the outer area.

Within 512 x 512 Dots

Displays the area outside of 512 x 512 dots as transparent.

Specified Character

Repeatedly displays the character specified in the index.

SGL Options

When a file is saved in SGL format and displayed on the target, the VDP2 flags must be set appropriately. For details on each flag, refer to the "Saturn Hardware Manual". [Dialog Box]

Plane Size

Specifies the plane size (in page units). When the map size (in page units) is not divisible by whole plane units, that plane size cannot be selected.

Character Control Data

Specifies the data size of pattern name data.

Character Numbering Assistance Mode

When character control data is one word, specifies the bits used for character numbering.

• Character Menu

When the Character window is active, this menu allows editing the character data of the selected area or the whole window.

Reverse

Characters in the selected area are reversed around the centerline of the selected area, with line symmetry.

Horizontal Reverse side-to-side. Vertical

Reverse top-to-bottom.

Rotate

Rotate characters in the selected area around the centerpoint of the selected area. After rotation, the characters in the selected area are in the floating state.

90° Clockwise

Rotate 90° clockwise. 90° Counterclockwise

Rotate 90° counterclockwise.

Display Palette

The color table used for the character window display is selected as the color palette. Note: The palette set here does not affect character palette information in the output file. It is intended to help the editing process based on intuitive visual effects.

Palette

Specifies the palette number for display.

Character Sort

Merge common character data in the selected area, and rearrange in descending order. Map data is changed according to the results of the sort. This is intended mainly to remove unneeded character data to minimize the amount of data within a limited area. Offset

Characters within the selected area are moved by a specified offset. Map data is changed to reflect the result.

[Dialog Box] Offset Specifies the offset amount for the characters.

• Map Menu

When the Map window is active, this menu allows editing the map data of the selected area or the whole window. Also allows operations such as setting and changing the color palette.

Reverse Horizontal Sets horizontal reverse flag for selected area map data.

Reverse Vertical

Sets vertical reverse flag for selected area map data.

Palette

Specifies the palette number for the selected area map data. [Dialog Box]

Palette

Specifies the palette number.

Map Size

[Dialog Box]

Changes the edit area of the Map window.

Horizontal Size

Specifies a new horizontal size of the map, in page units.

Vertical Size

Specifies a new vertical size of the map, in page units.

Edit Palette

Changes and edits the color palette. [Dialog Box] Click Color List Changes the color data at the selected location. Scroll Bar Changes the index of the palette to be edited. Color Balance Adjusts the color balance of the currently displayed palette. R Adjusts red intensity. G Adjusts green intensity. В Adjusts blue intensity. Color Hue, Saturation, Brightness Adjusts the color of the currently displayed palette. Η

Adjusts color hue.

S

Adjusts color saturation. L

Adjusts color brightness. Edit

Move and copy the currently displayed palette.

Cut

Cuts the palette. The cut palette is replaced by black code.

Copy

Copies the palette. The copied palette is unaffected.

Paste

Pastes the palette that was cut or copied beforehand.

Delete

Deletes the palette. The deleted palette is replaced by black code.

Window Menu

Shows the types and names of currently open windows, and determines how they are positioned.

Cascade

Cascades windows in layers offset from the upper left.

Tile Vertically Displays all windows, tiled from top to bottom.

Tile Horizontally

Displays all windows, tiled from left to right.

Align Icons

Aligns the icons of all minimized windows.

• Help Menu

Displays this Help window describing how to use the Map Editor, and general information about the Map Editor.

Contents

Displays the Help contents.

About

Displays general information such as the Map Editor version.

SS Monitor

About SS Monitor About SS Viewer About SS Debug File Menu Control Menu Help Menu Troubleshooting

About SS Monitor

SS Monitor provides the dynamic data communication protocol between an application and the DevSaturn target, through the **CartDev** system. Through this communications protocol, users can access the Sega Saturn as though it was an external PC device, *for running compliant applications*.

Related Items: About SS Viewer About SS Debug

About SS Viewer

When SS Monitor is loaded, it runs the general-purpose viewer program, **SS Viewer**. The SSSDK Graphic Tool provides the target display functions for data (or commands) transferred to the reserved memory map of SS Viewer, through communication between the applications.

SS Viewer supports the following display functions:

- 1) 3D Objects
- 2) 3D Animation
- 3) Normal Scroll
- 4) Rotation Scroll (3 axes)
- 5) Bitmaps

About SS Debug

SS Debug allows more detailed control of the target system when executed in place of SS Viewer at boot time. It is recommended when you need to use a customer display program other than SS Viewer for development.

Note: SS Debug cannot use the SSSDK Graphic Tool directly.

• File Menu

Provides basic control of the Monitor, and allows exiting the program.

Load Monitor

Downloads the monitor program. Not normally used.

Open COFF (SS Debug only) Downloads and executes a COFF (executable) file.

Open Binary (SS Debug only) Downloads a binary file. [Dialog Box] Address Specifies the download source address in hex. VDP1 Specifies the head address (\$25c00000) of VDP1. VDP2 Specifies the head address (\$25e00000) of VDP2. SGL Specifies the head address (\$06004000) of SGL user area. COL Specifies the head address (\$25f00000) of Color RAM. USER Specifies the input address for the *user-reserved* box.

Exit

Closes the application.

Control Menu

Provides basic control of the target.

Execute Viewer

Downloads and executes SS Viewer. Not normally used.

Set PC (SS Debug only) [Dialog Box] Sets the Program Counter. Program execution is stopped. Address Specify download source address in hex. SGL Specifies head address (\$06004000) of SGL user area. USER Specifies the input address for the *user-reserved* box.

Run (SS Debug only)

Executes the program from the current program counter.

Stop (SS Debug only) Stops execution of the program.

Reset

Resets the target.

• Help Menu

Display this Help window describing how to use SS Monitor, and general information about SS Monitor.

Contents Displays the Help contents.

About

Displays general information such as the SS Monitor version.

• Troubleshooting

SS Viewer Runaway

When the SS Viewer fails to respond to the SSSDK Graphic Tool, it can be rebooted by the following procedure.

1) Select Control Reset

2) Select File Load Monitor

3) Select Control Execute Viewer

Sega Converter

About Sega Converter File Menu Edit Menu View Menu Options Menu Window Menu Help Menu

About Sega Converter

The **Sega Converter** application displays 2D image data that has been saved in a variety of file formats, and converts between formats. Displayed images can be modified using several types of filters, and a highly refined color reduction function is provided to convert 16M-color True Color and 32k-color High Color images using 256- and 16-color tables.

The Converter also supports batch (catalog) handling for processing multiple files, a feature not usually found in a GUI application.

File loading, saving and filtering in the Sega Converter are all executed through external DLL plug-ins, so the functions are extensible by user-supplied plug-ins.

• File Menu

Provides file management, such as opening and saving files, processes such as printing, and exiting the editor.

New

Creates a new file.

[Dialog Box]

Size

Enter the width (H) and height (V) of the new file.

Color Mode

Selects the color mode for a new file. When selecting 16- or 256-color mode, also selects the color table to be used.

Open

Opens a previously saved file.

Close Closes the current file.

Save

Saves the current file.

Save As Saves the current file with a different name.

Catalog

Setup and execute batch processing of multiple files. Catalog Functions

Page Layout Set up the page layout for printing.

Print Prints the current file.

 $1 \sim 4$

Displays the last four most recently opened or saved files.

Exit

Closes the Sega Converter.

• Edit Menu

Provides image editing functions such as cut and paste, and sets the Sega Converter working environment.

Undo

Cancels the most recent operation. note that not all operations can be canceled.

Cut

Cuts the selected data to the clipboard.

Сору

Copies the selected data to the clipboard.

Paste

The image that has been saved on the clipboard is pasted over the current image. The pasted image can be repositioned immediately after it is pasted (floating state).

Delete

Erases the image in the selected area.

Select All Selects the whole image.

Cancel Selection Cancels the selection. A floating image is placed at its current location.

Clear Clipboard Deletes the image on the clipboard. Properties

Sets up the environment for each type of editing.

[Grid]

Units

Specifies the grid size.

Snap To Grid

Forces selection operations to adhere to grid units.

Color

Specifies the grid color.

[Paste]

Dither

Applying color by extrapolation (dithering) when the paste destination is capable of fewer colors than there are in the clipboard image.

Ignore Palette

Ignores the color table and pastes only bitmap information.

• View Menu

Changes display magnification of the working window and selects display/non-display of the grid.

Magnification

Displays the current working image with the specified magnification.

Grid

Displays/hides the specified unit grid over the current working image. Grid units are specified from the menu by <u>Edit Properties</u>

Options Menu

Executes color conversion and applies various kinds of filter processing.

Black and White

16 colors

256 colors

32k colors

16M colors

Converts the current image to the selected color mode. If the selected color mode has fewer colors than the image before conversion, the conversion method can be specified. [Color Table]

When converting to 16 or 256 colors, the color table can be specified for the conversion. Optimize

Creates an optimized color table from the color information in the current image. Custom

Uses a pre-registered color table.

[Dither]

Selects the dithering method used to display colors that are removed during conversion. None

Perform no dithering.

Pattern

Apply dithering pattern.

Error Diffusion

Apply dithering with error diffusion processing.

Color Table

Displays the color table used for the current image when the image is 16 or 256 color.

[Dialog]

Current

Displays the color table used for the current image.

Custom

Displays the pre-registered color table.

Register

Registers the displayed color table as the new table.

Filter

Executes a plug-in function to apply filtering to the current image.

Display

Executes a plug-in function to change the display method for the current image. Effect

Executes a plug-in function to apply a special effect to the current image.

Other

Executes a plug-in function to provide another type of treatment.

Note: When an area is selected within the image, plug-in effects apply only to that area. Otherwise, the effects apply to the whole image.

• Window Menu

Shows the types and names of currently open windows, and determines how they are positioned.

Cascade

Cascades windows in layers offset from the upper left.

Tile Vertically

Displays all windows, tiled from top to bottom.

Tile Horizontally

Displays all windows, tiled from left to right.

Align Icons Aligns the icons of all minimized windows.

Close All Closes all windows.

• Help Menu

Display this Help window describing how to use the Sega Converter, and general information about the Sega Converter.

Contents

Displays the Help contents.

About

Displays general information such as the Sega Converter version.

Catalog Function

The Catalog function is a special feature of the Sega Converter that simplifies applying particular processes to multiple files in a single step.

Currently supported processes are file format conversion and color reduction processing.

Edit List

Edits the list of files to be processed by the catalog function.

[Dialog]

Add

Adds a file to the list.

Delete

Removes the selected file from the list.

Refresh

Refreshes the file list based on the newest file information. When a listed file has been moved or deleted outside of the program, refreshing the list prevents errors from occurring with subsequent Catalog functions.

Save

Saves the current file list.

Open

Ôpens a previously saved file list. The current list is replaced by the list being loaded.

Display

Opens files in their registered order.

[Dialog]

Wait

Specifies a delay (in seconds) between opening files.

Close After Display

When checked, the current window is automatically closed when a file is opened.

Save

Saves a registered file to the list with a different name.

[Dialog]

Auto

Sets the color mode of saved files automatically. The color mode is generally unchanged.

Specify

Specifies the color mode of saved files.

Detail

When specifying the color mode, details can be set here. The settings are the same as the color mode settings of the <u>Options Menu</u>.

Color Table

Creates an optimized color table from all files registered in the list. The optimized table is registered automatically.

[Dialog]

Color Mode

Selects the number of colors for the table to be created.

Caption

Enter the registration name for the color table.

SS-SDK Plug-Ins

About Plug-Ins

Plug-In Functions

Resource Files

File I/O Modules

Effect Modules

Function Reference

• Function Reference

File I/O ModulesscvCheckFileFormatscvCetFileImageSizescvGetFileImageDepthscvGetFileImageBitsscvPutFileImageBitsscvBeginCatalogSavescvEndCatalogSave

Effect Modules scvEffectImageBits scvBeginEffect scvEndEffect

• About Plug-Ins

The SSSDK Graphics Tool allows the addition of custom user functions using Win32compliant DLLs (dynamic link libraries) for external functions.

An added function is called a "plug-in", and the DLL that provides the added function is called a "plug-in module".

Added functions are made available by copying their plug-in modules into the same folder as the SSSDK Graphics Tool executable.

• Plug-In Functions

The SSSDK recognizes two types of plug-in modules for different purposes:

- (1) <u>File I/O Modules</u> File input and output functions.
- (2) <u>Effects Modules</u> Apply effects such as filters to the display window.

Display Function Reference

• Resource Files

The following resources are reserved for SSSDK plug-in modules. When using resources in a module program, be careful to avoid usage conflicts with other modules.

STRING Resources Display Sample

ID 1: Specifies a plug-in function. File I/O Input Only "READ" Output Only "WRITE" Input and Output "READ WRITE" Effect "EFFECT"

ID 2: Specifies a 3-character alphanumeric extension for the file type used by this module. Letters should be in lower case.

The "eff" extension denotes an Effect file.

ID 3: Specifies the name of a displayed plug-in.

For File I/O

This becomes an item in the dialog pop-up menu.

For Effect

This becomes a sub-menu of the Effect menu.

ID 4: Specifies the color depths (in bits) supported by the module. Valid values are **1**, **4**, **8**, **16** or **24**.

Example: # STRINGTABLE DISCARDABLE BEGIN 1 "READ WRITE" 2 "dg2" 3 "DGT2 Files" 4 "4 8 16 24" END

• File I/O Module

[1: Input Module]

Reads files by the following procedure and displays in the window.

(1) Select a file with the Open dialog.

- (2) <u>scvCheckFileFormat</u>
- (3) scvGetFileImageSize

(4) scvGetFileImageDepth

- (5) scvGetFileImageBits
- (6) Display the window.

User-created input modules need to provide functions corresponding to steps (2) through (5) in the above procedure.

[2: Output Module]

Saves files by the following procedure.

(1) Specify a file name in the Save dialog.

(2) <u>scvPutFileImageBits</u>

(3) The file is saved.

When using the Catalog function, files are saved by the following procedure.

- (1) Specify a save directory in the Save dialog.
- (2) <u>scvBeginCatalogSave</u>
- (3) scvPutFileImageBits
- (4) Files are saved (by repeating step (3) for each file in the catalog list).
- (5) <u>scvEndCatalogSave</u>

User-created output modules need to provide functions corresponding to steps (2), (3) and (5) in the above procedure.

Display Function Reference

• Effect Modules

An effect is applied to the window by the following procedure.

- (1) Select an item on the Effect Menu.
- (2) scvBeginEffect
- (3) scvEffectImageBits
- (4) scvEndEffect
- (5) Redraw the window.

User-created effect modules need to provide functions corresponding to steps (2) through (4) in the above procedure.

Display Function Reference

(1-1) • scvCheckFileFormat

Function: Checks the specified file format.

Format:

BOOL WINAPI scvCheckFileFormat(LPSTR libDLL, LPSTR filename);

Return Value: BOOL (Format matches or not)

Calling Arguments: LPSTR libDLL DLL instance handle LPSTR filename specified filename

Usage:

Opens the file, and then closes it after checking the format. Returns TRUE when the specified format matches, or FALSE if it does not match.

(1-2) •scvGetFileImageSize

Function:

Reads the vertical and horizontal size of a specified file.

Format:

void WINAPI scvGetFileImageSize(LPSTR libDLL, LPSTR filename, LPSTR hsize, LPSTR vsize);

Return Value: none

Calling Arguments:

LPSTR libDLL DLL instance handle

LPSTR filename specified filename

LPSTR hsize pointer to horizontal size of image

LPSTR vsize pointer to vertical size of image

Usage:

Opens the file, and then closes it after getting the dimensions. Sets the long value pointed to by hsize to the horizontal size. Sets the long value pointed to by vsize to the vertical size.

(1-3) • scvGetFileImageDepth

Function:

Reads the color depth of the specified file.

Format:

long WINAPI scvGetFileImageDepth(LPSTR libDLL, LPSTR filename);

Return Value: long ColorDepth

Calling Arguments: LPSTR libDLL DLL instance handle LPSTR filename specified filename

Usage:

Opens the file, and then closes it after getting the color depth. ColorDepth (in bits) is returned as 1, 4, 8, 16 or 24 (32).

(1-4) • scvGetFileImageBits

Function: Reads the bitmap from the specified file.

Format:

int WINAPI scvGetFileImageBits(LPSTR libDLL, LPSTR filename, LPSTR buff);

Return Values: Successful completion 0 Error non zero

Calling Arguments: LPSTR libDLL DLL instance handle LPSTR filename specified filename LPSTR buff bitmap buffer

Usage:

Opens the file and reads the bitmap data into memory. Closes the file and returns 0 for normal finish. Returns non zero when an error occurs before completion.

Remarks:

The <u>Bitmap Memory</u> Bitmap Memory is stored as an array of horizontal size vertical size color depth (bits), but the format varies slightly according to the color depth.

(2-1) • scvPutFileImageBits

Function:

Saves a bitmap to the specified file.

Format:

int WINAPI scvPutFileImageBits(LPSTR libDLL, LPSTR filename, LPSTR buff, LPSTR hs, LPSTR vs, LPSTR depth);

Return Value: Successful completion 0 Error non zero

Calling Arguments:

LPSTR libDL	L DLL instance handle
LPSTR filena	ame specified filename
LPSTR buff	bitmap buffer (memory)
LPSTR hs	pointer to horizontal size of image
LPSTR vs	pointer to vertical size of image
LPSTR depth	pointer to color depth of image

Usage:

Pointers hs, vs and depth point to the respective values cast to long. Opens the file and writes the information from the bitmap buffer. Closes the file and returns 0 for normal finish. Returns non zero when an error occurs before completion.

Remarks:

The <u>Bitmap Memory</u> Bitmap Memory is stored as an array of horizontal size vertical size color depth (bits), but the format varies slightly according to the color depth.

(2-2) • scvBeginCatalogSave

Function:

To be called before the catalog save loop is executed.

Format:

int WINAPI scvBeginCatalogSave(LPSTR libDLL, LPSTR filename, LPSTR num);

Return Value: Successful completion 0 Error non zero

Calling Arguments:

LPSTR libDLLDLL instance handleLPSTR filenameString (filename) entered by the Save dialog

LPSTR num Pointer to catalog number

Usage: Normally returns zero. Use to save catalog data in one file.

(2-3) • scvEndCatalogSave

Function: Called after the catalog save loop has been executed.

Format: int WINAPI scvEndCatalogSave(LPSTR libDLL, LPSTR filename);

Return Value: Successful completion 0 Error non zero

Calling Arguments: LPSTR libDLL DLL instance handle LPSTR filename String (filename) entered by the Save dialog

Usage: Normally returns zero.

(3-1) • scvEffectImageBits

Function: Applies an effect to a bitmap.

Format:

int WINAPI scvEffectImageBits(LPSTR libDLL, LPSTR buff, LPSTR hs, LPSTR vs, LPSTR depth)

Return Value: Successful completion 0 Error non zero

Calling Arguments: LPSTR libDLL DLL instance handle LPSTR buff bitmap buffer LPSTR hs pointer to image horizontal size LPSTR vs pointer to image vertical size LPSTR depth pointer to image color depth Usage:

Pointers hs, vs and depth point to the respective values cast to long. The effect is applied to the bitmap buffer. Returns 0 for normal finish.

Returns non zero when an error occurs before completion.

Remarks:

The <u>Bitmap Memory</u>Bitmap Memory is stored as an array of horizontal size vertical size color depth (bits), but the format varies slightly according to the color depth.

(3-2) • scvBegineEffect

Function:

To be called before applying an effect.

Format:

int WINAPI scvBeginEffect(LPSTR libDLL);

Return Value: Successful completion 0 Error non zero

Calling Arguments:

LPSTR libDLL DLL instance handle

Usage: Normally returns zero.

(3-3) • scvEndEffect

Function: To be called after an effect has been applied.

Format: int WINAPI scvEndEffect(LPSTR libDLL);

Return Value: Successful completion 0 Error non zero

Calling Arguments: LPSTR libDLL DLL instance handle

Usage:

Normally returns zero.

• Bitmap Memory

Color depth: 1

The bitmap is structured as 1 bit/pixel. The horizontal size is limited to a 1-byte boundary. 1 = black, 0 = white.

Color depth: 4

16 color array structure The RGBQUAD structure body is configured for 16 colors. The bitmap is structured as 4 bits/pixel. The horizontal size is limited to a 1-byte boundary.

Color depth: 8

256 color array structure The RGBQUAD structure body is configured for 256 colors. The bitmap is structured as 8 bits/pixel.

Color depth: 16

Direct color system. The bitmap is structured as 16 bits/pixel, with each color stored in the form 0b | R5 | G5 | B5.

Color depth: 24 (32)

Direct color system. The bitmap is structured as 32 bits/pixel, with each color stored in the form 8b | R8 | G8 | B8.

• Hierarchy Structure - Tools Menu

Controls display or non-display of the structure of the currently selected hierarchy. Also allows editing the model name.

Display

Displays the structure of the currently selected hierarchy. When a structure tree is inherited, applies to all models in classes *beneath* the current model.

Hide

Hides the structure of the currently selected hierarchy. When a structure tree is inherited, applies to all models in classes *beneath* the current model.

Change Name

Changes *the* model name in the structure of the currently selected hierarchy. When saved in MDL format, notice that the name specified here is changed. 3D Editor File Formats

Hierarchy Info

Displays the matrix information of the currently selected hierarchy.

Close

Closes the Hierarchy Structure window.

-end