

PROMISED DELIVERED

DTS WWW ENVIRONMENT IS A REALITY

Making good on its promise, Sega DTS will unveil the *Developer Technical Support World Wide Web Environment* at E3 in Los Angeles. The DTS Web environment will be one of the most comprehensive sites solely devoted to the art of game development. Sectioned off from the outside show, the page will be available for perusal in the Sega Developer's Room.

Sega is determined to make this site a constantly evolving, interactive tool that no Saturn developer will want to do without. Using the Adobe Acrobat technology, the site will house more than 5000 pages of Saturn *documentation* that will be available to all authorized game developers. A few clicks of the mouse will bring volumes of documentation to a developer's desktop in a matter of minutes. *Frequently Asked Questions* (FAQ's) will have an easy to navigate section with indexed buttons for easy access to the answers of the most asked questions and the not-so frequently asked. The *Art* and *Audio* sections will be home to specialized text and tools devoted to their respective topics. Adding to the ease of acquisition, the *Hardware* section will contain an itemized catalog listing of developer hardware. Select on a particular product and you will be taken to a page with descriptive color photography and text that will inform you on your possible hardware purchase. *Software* tools will also be able to be retrieved from the site as well as *Vendor* information as it relates specifically to the Saturn.



All developers registered with Sega DTS will be issued a username and password via e-mail. The password and username issued will be valid for 90 days. As expiration nears, a developer's employment will be confirmed and a new set of security measures will be issued.

The only other requirements to use this site are a 14.4 bps modem or greater, Netscape 2.0 and the appropriate plug-ins. Netscape and plug-in links will be provided at the site for your convenience.

JUNE '96 DTS CD HITS THE SHELVES

Table of Contents

Sega Sound Bulletin	3
Q&A	3
Sega Software Development Kit	4
BBS/Tools	5
Animetix Tools	5
SEGA Profile - Renee Greenwood	6
Documentation	7

MAKE A
NOTE

E3
DEVELOPERS
ROOM
be there!

Sega DTS will be previewing at E3 the latest DTS CD dated June '96. There's something for everyone on the CD whether you're an artist, sound designer or programmer.

Featured on this CD will be:

- New Scene Interchange File Format (SIFF) Specifications (previously called SGA3 IFF Specs.)
- Latest preliminary version of SGL 2.1 (SGL 2.0A will still be included with final translated readme files)
- Sega of Japan has released the English version of the ADPCM encoder. It compresses AIFF files 4:1 and is used on a Mac OS system
- Standardized Sound Tools that are the most functional and solid set of tools enabling you to deliver clean files to your programmers. The files included with the Sound Simulator will contain the most stable sound driver to date. (SDDRV.S.TSK, version 1.31)
- New Saturn Documentation and Updates

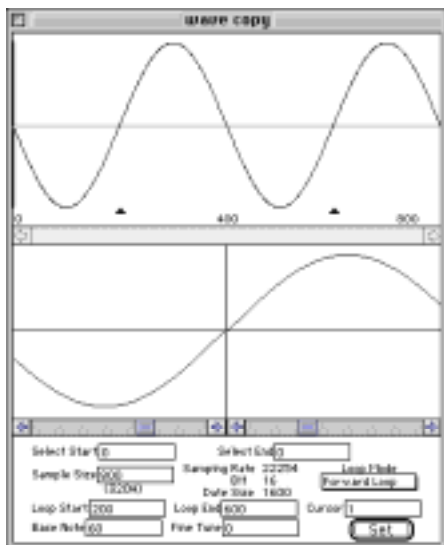
Receiving the DTS CD is a great way to have the development software you need right at your fingertips! We especially encourage managers/directors of art, sound, or programming groups to add themselves to the DTS CD distribution list, become fully informed about what Sega has to offer, and share this information with the artists, sound designers, or programmers in your group. To make sure you're on the list for receiving the DTS CD or to add yourself to it, e-mail us at dts@sega.com or call the DTS Hotline:

415 802-1719.





In the process of creating FM sounds for our library, we noticed that it was extremely difficult to create clean sounding FM instruments. Essentially, the looping hardware in the Saturn is subject to very small delays which affect the cleanliness of the loop. When you're doing FM, this imperfection is magnified, leading to noisy FM. By looping somewhere off the edges of the wave, you have some tolerance for hardware delays. Therefore, if and when the looping procedure is delayed, the sound continues with the correct data rather than invalid data that remains in memory preceeding the wave. When it finally does jump to loop start, you may not match the sample data exactly, so you still may get a little noise. It's still far cleaner. It is also possible that this part of the loop could be cleaned up with a lower sample rate. As you can see in the example below, there are two full cycles of a sine wave and only one of those cycles is looped. This allows the Saturn to continue to pass the loop end point while continuing to play the same type of data as it would in the beginning of the loop.



Q. I am trying to optimize my C "stuff" in assembly, using the -S option on the compiler. What are the calling conventions? What registers am I free to use? Also, I am using the SGL libraries. Can I explicitly use the second SH-2, if so, how?

A. *The conventions for calling SH2 subroutines from C are described in the `gnu read.me` file. Search for "register" and you'll find them fairly quickly.*

SGL keeps the slave pretty busy, but you can add your own functions to the functions that the slave normally performs under SGL. By calling `slSlaveFunc()`, you can queue up a function to be executed by the slave SH2. Unfortunately, there is no guarantee as to how long it will take before SGL gets around to executing it. You need to be careful not to call any SGL functions which expect to be able to use the slave themselves, such as `slPutPolygon()`. Also, the SGL documents seem to imply that reading the peripherals from the slave is a bad idea. The prototype for `slSlaveFunc()` is given in the file `math.txt` in the doc directory of SGL.

There is also a function called `slPutPolygonS()`, which is slightly different from `slPutPolygon()`. When you call `slPutPolygon()`, the work is performed by either the master or the slave, depending on which one is available. When you call `slPutPolygonS()`, the work is always done by the slave, but not until the start of the next frame.

The idea is to create a pipeline in which the slave spends the first part of each frame building the command tables for the polygons that were generated on the previous frame. The official description of this function is found in the file `modify.txt` in the doc directory.

Q. Are there any details available about the hardware clipper? Does it just "not draw pixels off the screen" but look at each pixel or does it do the multiples required to skip a bunch of pixels?

A. *By default, the VDP1 examines each line before drawing it to see if that entire line can be clipped. If so, it skips to the next line. This is called "preclipping," and it costs about 5 cycles of overhead per line. Since pre-clipping does not do anything about lines that are only partially outside the clipping window, the VDP1 must also examine each pixel of each line that has not been pre-clipped to see whether or not the pixel is displayable. You can disable pre-clipping on a sprite-by-sprite basis by using the "Pclp" bit in the third word of the VDP1 command table. Setting this bit to 1 disables pre-clipping. Disabling pre-clipping is a good idea for sprites that you know aren't going to be clipped, or for sprites that are small enough that the overhead incurred by pre-clipping isn't worth it.*

Developer Technical Support is changing the face of its communications and we want to make sure you stay in touch. Efficiency is the name of the game as we rapidly transition to an on-line service center which will deliver comprehensive information regarding Saturn game development via e-mail, web site and ftp.

E-mail is now an essential part of our operations, making it more critical than ever for you to get your e-mail address to us (send it to dts@sega.com). You will also need Web access, especially now that we are debuting our DTS web site at E3. The site will let you explore an extensive FAQ section, download documentation and tools, get ordering information, and peruse a whole host of other information that will be just a mouse click away. Stay tuned as we keep you posted as Sega DTS takes technical support to the next level with on-line access.

Sega Saturn Software Development Kit (SS-SDK)

Sega Debuts New Integrated Development Environment

The **Sega Saturn Software Development Kit (SS-SDK)** is a Windows 95 based development environment that will increase productivity as well as increase the quality of game applications. The SS-SDK is comprised of a high-speed, high-quality software library and a suite of integrated user-friendly content development tools.

New Sega Saturn 3D Game Library (SGL)

Based on the proven **Sega Saturn 3D Game Library (SGL)** technology, the new version of SGL will incorporate new functionality while maintaining backwards compatibility with previous versions of SGL. New library functions such as **near-clipping**, **real time Gouraud shading**, **colored light sources**, and **depth cueing** will greatly improve the image quality of game applications. Moreover, the new SGL will have improvements in dual CPU utilization that will offset the processing overhead added by the new functions. In short, SGL's high-speed performance will remain despite with the addition of the new features.

Windows 95 Graphic Tools

The SS-SDK also features a suite of integrated Win 95-based graphic tools. These tools feature inter-application data sharing capabilities that enable the efficient preview/simulation of SGL-based graphics on the development target. The ease of use of these tools will give artists the freedom to refine and perfect artwork by viewing changes quickly and effortlessly in real time. Support for SGI workstations as well as new technological advances such as those in the field of motion capture data processing will also be available. The SS-SDK tools suite will provide an extensible pathway into the future.

Sample Code

The SS-SDK provides the user with three levels of sample programs that illustrate the use of the library.

- Level 1:** Demonstrates basic uses of SGL on the Saturn.
- Level 2:** Shows practical applications of SGL as well as Saturn hardware features.
- Level 3:** Provides sample games in various genres that showcase SGL's features.

See the work-in-progress version of the SS-SDK at E3!



Animetix Announces Saturn Dev Tools for 3D Studio MAX

Animetix Technologies has announced that its GAMUT-SG development tool for the Sega Saturn will be available for Autodesk's 3D Studio MAX. Currently the development tool is available for 3D Studio Release 4 running on the DOS platform. The GAMUT-SGm suite of tools permits games developers to convert models in a 3D Studio MAX scene to the SEGA Saturn SGL and SIFF file formats for direct import into the Saturn game development environment. Developers using a CartDev interface on their PC can also interactively preview their 3D Studio MAX models in full detail on the Saturn console.

The converter runs as a distributed plug-in set for 3D Studio MAX and supports conversion of geometry, materials, textures, and texture mapping coordinates. Texture bitmaps are automatically converted to the Saturn's format, with control over output resolution.

The GAMUT suite contains additional tools to assist game developers:

Quad Manager is a modifier plug-in that allows the developer to convert triangle-based models from 3D Studio MAX into quadrangle-based ones, as required by the Saturn. The user has full control over a number of different parameters that can be used to fine-tune the resulting geometry.

Attribute Manager is a powerful application that allows the user to optimize the use of Saturn-specific attributes and texture maps within the converted files. The tool is a modifier plug-in that allows the user to visualize and control the attributes and textures that are associated with selected faces on a model. Saturn-specific attributes are supported, along with 3D Studio materials and textures. Redundant textures are automatically removed and a full set of statistics ensures that the texture memory usage is easily monitored.

Mesh Manager is a modifier plug-in that provides control over the polygon count of models in the 3D Studio MAX scene. The tool is a modifier plug-in that operates at the face-level on mesh models, allowing the user to reduce the number of polygons in a model only in areas where detail is less important.

Palette Manager is a utility plug-in that allows the user to create color palettes for the Saturn, based on the RGB colors used by textures in the current scene. Palette Manager automatically produces an initial palette that can be subsequently modified by the user to add, remove, or replace individual entries, as required. The user can merge palettes created by the Palette Manager into a single palette, and can lock entries to ensure that they are preserved.

GAMUT-SG for 3D Studio R4 is available now from Animetix Technologies and costs US \$995. GAMUT SGm will be available in the third quarter of 1996. For more information on either of these products, please contact Animetix Technologies at (604) 608 1941, by e-mail at adamw@axionet.com, or visit the Animetix web page: <http://www.animetix.com>.

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for more information

regarding Gamut-SG

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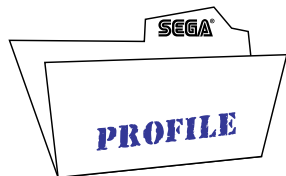
CANADA V7H 3W7

<http://www.animetix.com>

Renee Greenwood

Product Manager of Developer Products & Services

With activities like windsurfing, rock climbing, and a taste for Cajun food peppering her life outside of Sega, it's no wonder Renee Greenwood, Product Manager at Developer Products & Services, doesn't flinch at her title or job duties. Her main job focus is to improve communication with developers about all products and services offered by Sega Developer Technical Support and to coordinate the rollout of future products.



Renee works closely with all of the Developer Products and Services group which handles requests from the DTS line. Along with all of her other tasks, Renee is personally committed to keeping Sega's developer community informed about new vendor products and tools.

Before joining Sega in December of 1993, Renee worked with the Synthesis Engineering Education Coalition, a National Science Foundation project, performing curricular research and development focusing on K-12 math, science and technology education. She also served as Director of the Women's Engineering Program at Cal Poly, San Luis Obispo, defining retention and recruitment programs for students. In 1991, Renee received her Aeronautical Engineering degree from Cal Poly, SLO.



SATURN TOOLS

The following is a list of the current Saturn Development Tools. Refer to the key in order to find the latest releases of these tools.

KEY:

- ▲ SEGA DTS MAY '96 CD
- ▼ SEGA DTS BBS
- Contact vendor directly for information about product. Details on where to call are listed.
- Contact SEGA DTS at 415-802-1719 or e-mail dts@segaoa.com

PROGRAM

- ▲▼ **BGCON** (2D Background Converter, version 1.61)
- ▲▲ **CF.EXE & ROF2BIN.EXE** (Converters)
- ▲▼ **GNUTOOLS** (SOA960412)
- ▲▼ **HSI_TL** (For development of Cartdev Tools)
- ▲▼ **DSPASM & DSPSIM** (SCU DSP assembler & simulator, version 2.00 & 2.11 respectively)
- ▲▼ **VCD** (Virtual CD tools & demos)
- ▲▼ **EXAMPLES from DEVCON96** (Demonstration code)
- **SNASM2.1d** (Development software by Cross Products; assembler/linker and debugger)
- **PSY-Q** (Development Software by Psy-Q Dev. Systems. Contact Psy-Q Sales at +44 (0)151 282 3000 or e-mail psyq@psygnosis.co.uk)
- **Hitachi** (Development Software: C Compiler, Assembler and Debugger)
- **TrueMotion** (Video compression tools by The Duck Corporation)
- **Cinepak** (Video compression tools)

GRAPHICS

- ▲ **Sega Macintosh Art Tools**
 - 3DEditor 1.72US
 - MapEditor 1.81E
 - ScreenEditor 1.07E
 - QuickViewer 3.17US
 - Sega2DViewer 1.0US
 - SegaConverter 4.83E
 - SegaPainter 1.11US
 - SpriteEditor 1.36US
- ▲▼ **PhotoShop Plug-Ins** (6 plug-ins)

Vendor PC Art Tools

- **GAMUT-SG** (Downloader/Converter by Animetix for Autodesk 3D Studio ver. 4.0. Contact Adam Walters at 604-730-5627 or e-mail adamw@axionet.com)
- **InterChange** (3D conversion tool by Synthesis for Windows. Contact Tanya Murray at 414-764-5200 or e-mail synthesis@inc.net, <http://www.webmaster.com>)

Vendor SGI Art Tools

- **SOFTIMAGE 3D Design Toolkit** (Created for version 3.0 of SOFTIMAGE 3D. Contact Gary Horstkorta at 510-803-2300 or e-mail garyho@microsoft.com, <http://www.softimage.com>)
- **Saturn Express** (Downloader/Converter by Nichimen Graphics for N•World ver. 2.1. Contact Bill Clark at 303-693-8999 or e-mail bclark@nichimen.com, <http://www.nichimen.com>)
- **Wire to Sega GL Converter** (Created by Alias|Wavefront for PowerAnimator V7. Contact Alias|Wavefront at 800-447-2542 or e-mail info@aw.sgi.com, <http://www.aw.sgi.com>)

LIBRARY

- ▲▼ **SGL** (version 2.1 & 2.0a)
- ▲ **SBL** (version 6.0)

SOUND

- ▲▼ **Sega Sound Tools & Converters**
 - Sound Simulator** (version 2.06ce)
 - Tone Editor** (version 2.06 & 1.13 are both current)
 - DSP Linker** (version 2.0)
 - Wave Editor** (version 1.13)
 - AIFF to RedBook**
 - Tools Demonstrations**
 - Sample Code**
- **QSound** (3D Sound DSP)
- **YSound** (3D Sound DSP)
- ▲ **InVision Tone Library**
- ▲▼ **ADPCM Encoder** (Version 1.0)

OTHER

- ▲ **Demos and Sample Code from assorted DevCon '96 Exhibitors**

DOCUMENTATION

Listed below is the complete set of Saturn documentation as of April 30, 1996. If you wish to order a complete set of Saturn documentation, contact us by e-mail or use the Fax Back section on the last page of the newsletter. **DTS e-mail: dts@sega.com / Fax: (415) 802-1717**

Document Name	Document #
SATURN PROGRAMMING MANUAL VOL. 1	
Saturn Introduction Manual	ST-155-062094
Sega of America-Introduction to Saturn Game Development	13-Apr-94
Saturn Overview Manual(temporary version 1)	ST-103-R1-040194
SCU User's Manual	ST-97-R5-072694
SCU Final Specifications: Precautions	ST-210-110194
SMPC User's Manual	ST-169-R1-072694
SMPC Sample Program User's Manual	ST-214-111594
Saturn SCSP User's Manual	ST-77-R2-052594
SEGA Saturn Dual CPU User's Guide	ST-202-R1-120994
SATURN PROGRAMMING MANUAL VOL. 2	
VDP1 User's Manual	ST-013-R3-061694
VDP1 User's Manual Supplement	ST-13-SP1-052794
VDP2 User's Manual	ST-58-R2-060194
SATURN DEVELOPMENT TOOLS MANUAL	
Sega Saturn Software Development Standards	ST-151-R3-082295
Boot ROM User's Manual	ST-079B-R3-011895
Disc Format Standard Specifications Ver.1.0	ST-040-R4-051795
Backup System Production Standard	ST-203-100494
Sample Game Program User's Manual	ST-159-R1-092994
Sample Data User's Manual	ST-160-R1-092994
NEW SATURN Demo - Demo File Loader Specifications Ver. 1.20	ST-250-R1-031296
SCU DSP Assembler User's Manual	ST-240-A-042795
SCU DSP Assembler User's Manual Addendum	ST-240-A-SP1-052295
SCU DSP Simulator User's Manual	ST-240-B-042795
SCU DSP Simulator User's Manual Addendum	ST-240-B-SP1-052295
CD Development Tool Description File	ST-211-110494
Virtual CD System User's Manual	ST-129-R2-093094
Virtual CD Supplementary Manual	ST-129-R2-SP1-061995
MPEG Stream Build Precautions	ST-129-R2-SP2-082495
Virtual CD System (Release 3) Limitations	ST-182-081294
Write Once CD-R System User's Manual	ST-201-B-092994
SH2 Dynamic Load Linkage Editor	ST-19-R1-B-050994
Authoring Environmental Guide	ST-91-R1-062794
Saturn Author User's Manual	ST-164-062794
SEGA BASIC LIBRARY (SBL)	
Saturn System Library User's Guide ver.1.0	ST-162-R1-092994
System Library User's Manual	ST-162-062094
Program Library User's Guide 1	ST-136-R2-093094
Branching Playback Library User's Manual	ST-136-D-R2-082495
Program Library User's Guide 2	ST-157-R1-092994
Program Library User's Guide 3	ST-135-R4-092295
DLL Library User's Manual	ST-200-092994
External Specification Doc. Saturn Stream System	ST-98-031194
Saturn Software Library Release 3.01 Supplemental Disk	ST-208-110194
Sega Basic Library 6.0 - ReadMe File Series	ST-267-011296
SATURN GRAPHIC LIBRARY (SGL)	
SGL Developer's Manual Tutorial	ST-237-R1-051795
SGL Developer's Manual Reference	ST-238-R1-051795
NEW SGL 2.0 - ReadMe File Series	ST-DISK-010-B-R1-021396
SATURN GRAPHICS TOOLS MANUAL	
3D Editor1.72US (ReadMe, Release Notes)	SGT-DISK-102795
MapEditor1.81E (ReadMe, Release Notes, Basics)	SGT-DISK-102795
ScreenEditor 1.07E (ReadMe, Release Notes, Basics)	SGT-DISK-102795
QuickViewer 3.17US (ReadMe, Release Notes)	SGT-DISK-102795
Sega2DViewer 1.0US (ReadMe)	SGT-DISK-102795
SegaConverter 4.83E (ReadMe, Release Notes)	SGT-DISK-102795
SegaPainter 1.11US (ReadMe, Animation, Menu, Palette/Color, Tool Palette)	SGT-DISK-102795
SpriteEditor 1.36US (ReadMe, Release Notes, Basics)	SGT-DISK-102795
Saturn/32X Graphics References ver. 2.0	ST-124-R1-091394
SATURN SOUND TOOLS MANUAL	
Sound Development Manual ver, 1.1	ST-81-R5-062894
Saturn Sound Simulator Manual	ST-168-R3-011895
Wave Editor User's Manual	ST-99-R1-042594
SCSP Waveform Editor Technical Specifications	ST-67-121593
Tone Editor User's Manual	ST-68-R1-042594
Tone Editor User's Manual Addendum: File Format	ST-235-030795
SCSP/DSP Effect Module Specifications	ST-69-121693
DSP Linker User's Manual	ST-70-R1-031094
NEW dAsms User's Manual	ST-228-R1-030595
Parameter Editor User's Manual	ST-227-R1-030595
Saturn Sound Tools Manual Supplement	ST-198-R1-121594
SATURN Sound Driver System Interface Version 3.03	ST-166-R4-012395
Standard MIDI File: Converter Specifications	ST-66-121593
Sound Programming Debugger User's Manual	ST-65-R1-031494
Microcomputing Developing Int. Environment for Macintosh	ST-80-R2-050994

Fax Back

Thanks to those who have shared comments and ideas regarding the DTS Newsletter. Please continue to give us your feedback so we can work together to make the future issues even better. Please take a moment to fill out the information below and mail or fax it to Sega @ (415) 802-1717, or e-mail us at dts@sega.com

What did you like/dislike about this issue of SEGA DevelopMental? _____

How can DTS better support your development efforts? _____



What features/information would you like to see included in upcoming issues? _____

If you need documentation, list the title and number below. You must have a SEGA non-disclosure document on file to receive documentation. If you have not signed a non-disclosure, contact DTS.

Please provide your e-mail address to facilitate communication. _____



Developer Technical Support
150 Shoreline Dr., Dept. 448
Redwood City, CA 94065

Aright look,  we know it's a pain,
but we changed our e-mail stuff again. **Forget**
"john.doe@sega.com"
NOW it's
john.doe@sega.com. So...
 **DTS is now DTS@sega.com**
Much easier, dont you think?
Besides, you don't have any say in the matter.