INTRODUCTION

Genesis Plus emulates a Sega Genesis or MegaDrive console. It has been originally written by Charles MacDonald and ported to the Nintendo GameCube by The "Genesis Plus" Team.

It is an open source emulator and a community project which aims to bring you blast processing into the past. Using this "emulator" you will be able to enjoy all of your classic 16bit games in all of their glory. Genesis Plus has been converted from a PC based platform to run on the GameCube's proprietary PPC Gekko processor and features customized code to give you the best gaming experience possible.

This port is based on Genesis Plus 1.2 source code but it has been largely modified to improve overall compatibility, emulation accuracy as well as adding various peripheral supports and interface extra features.

Please have a look at history.txt for a complete changelog.

FEATURES

- ✗ accurate & full speed Sega Genesis emulation
- ✗ Stereo Sound (@48 kHz)
- ✗ PAL Megadrive (50Hz) timings support
- ✗ 1~4 Players support
- ✗ SDLOAD or IPL reboot
- ✗ SRAM autoload (optional)
- ✗ ROM Information Screen
- ✗ Zipped roms support
- ✗ Interleaved roms support (.smd)
- ✗ Load roms from SDCARD or DVD (4.7GB DVD support for Wii users)
- ✗ Load/Save SRAM and FreezeState files from/to Memory Card & SDCARD (compressed)
- ✗ Original NTSC & PAL progressive rendering modes (240p/288p) support
- ✗ Enhanced Interlaced Mode 2 (double resolution screen) support
- ✗ Extra emulation support for:

    - ✗ 6-Buttons gamepad
    - ✗ Sega TeamPlayer & EA 4-Way Play
    - ✗ J-Cart (autodetected)
    - ✗ Sega Menacer (autodetected for Menacer 6-in-1 game)
    - ✗ external SRAM
    - ✗ serial EEPROM (used by a few games as backup RAM)

- ✗ ROM bankswitch (Super Street Fighter 2)
- ✗ SRAM switch (Phantasy Star 4, Legend of Thor, Sonic 3 & Knuckles)
- ✗ Mappers & copy protection devices used in many unlicensed/pirate cartridges
- ✗ SVP dsp (Virtua Racing)
- ✗ Game Genie
- ✗ Overscan area (horizontal & vertical colored borders)
- ✗ TMSS BIOS support (optional)

CREDITS

- Original emulation code by Charles Mac Donald (http://cgfm2.emuviews.com/)
- Z80, 68000 and YM2612 cores by the MAME project (http://mamedev.org/)
- Alternate YM2612 core by Stéphane Dallongeville (http://gens.consolemul.com/)
- SN76489 core by Maxim (http://www.smspower.org/maxim/)
- SVP Core by Notaz (http://notaz.gp2x.de/svp.php)
- Original Gamecube's port by Softdev, Honkeykong & Markcube
- Graphical interface and icon design by Brakken (http://www.tehskeen.net)
- LibOGC by Shagkur & Warmtoe
- Extra features and genesis core updates by EkeEke

SPECIAL THANKS

- Tasco Deluxe for having made SVP emulation possible and for his documentation of Realtec mapper
- Bart Trzynadlowski for his documentation about SSFII and 68000 undocumented behaviour
- Haze for having found and documented many unlicensed cartridges protections.
- Notaz & Stef, respective authors of Picodrive and Gens, their sourcecode were a great source of inspiration
- People at SMS Power and Spritesmind.net forums for having provided so many useful technical informations,

- People at Tehskeen for their feedback and support.

HOW TO COMPILE THE SOURCECODE ?

According to the GNU status of this project, the sourcecode MUST be included in any binary releases you made. To recompile the sourcecode, you will need to have installed:

- DevkitPPC environment
- libOGC last sources

Actually, you also need to replace the original "gu_psasm.S" file which is located in the /LIBBOGC directory (from the root of libogc source directory) with the one included with these sources and recompile/reinstall libogc.

HOW TO RUN ?

The emulator is provided as a .dol which is a Gamecube Executable. You need to load and run the DOL on your GC or WII (Gamecube controller is needed) using various methods (Bootable DVD, SDLOAD,...). If you have no idea on how to load&run a DOL, please go here on follow the available guides: http://modyawii.tehskeen.com (Booting Homebrew Section)

SDCARD users should create a directory named **"/genplus"** at the root of their SDCARD. Inside this directory, you have to create a subdirectory named **"/genplus/roms"** to put all your roms. You should also create a subdirectory named **"/genplus/saves"** where SRAM and FreezeState files will be saved.

For Wii users, please note that the native SD slots can *NOT* be acceeded, you need to use a SD-Adapter in one of the MCARD Slot (both slots can now be used).
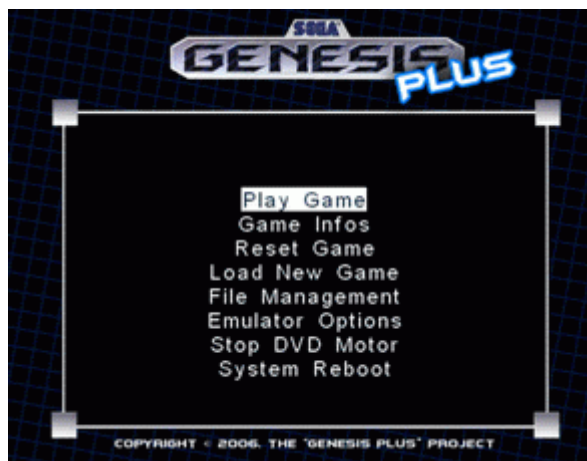
If you are using a DVD to load the roms, the format of the image you burned must be ISO9960 or you won't be able to read from it. The maximal readable size is 1.35GB for Gamecube users and 4.7GB for Wii users.

When putting roms either on DVD or SDCARD, it is recommended to use subdirectories as there is a limit of 1000 files per directory that could be read. Also note that the SDCARD library has some bugs when multiple files with similar filenames (i.e which have the same 6 first characters, space included) are present in the same subdirectory. Be sure to limit the number of files and NEVER put more than four files with similar filename within the same directory !

HOW TO USE ?

You'll start off with the main introduction screen and after pressing "A" you will be at the main menu. When you are navigating through the menus, the following keys on your Gamecube controller are used:

- "D-Pad" and Left Analog Stick let you move the select bar.
- "A Button" let you enter the selected submenu or performs the selected action
- "B Button" let you go back to the previous menu (it can also be used to go back to the game when you are at the main menu)

For Wii users, please note that this software is running in Gamecube compatibility mode, Wii controllers such as Classic Controller are not supported.

PLAY GAME

This will takes you into or back to the game. During gameplay, in addition of the usual controls, the following "special keys" on your Gamecube controller are used:

- pressing the "**Z trigger**" let you go back to the Main Menu
- pressing simultaneously "**L + Z triggers**" will execute a "Soft Reset" which should be like pressing the RESET button on a real Genesis. This is needed by some games to unlock special features or, for example, by the X-Men game to complete the "Mojo's Crunch" level.

GAME INFOS

This screen shows some basic informations for the loaded ROM.

You can use Up/Down buttons or Analog Stick to scrolldown the screen and display all informations. At the bottom of the list, you can see the peripherals that the game should be supporting: please note that if it supports 6-button gamepads, they are automatically selected for you. Otherwise, the standard 3-button pad is used (this can also be forced in Joypad Config menu).

RESET SYSTEM

This should be like switching OFF/ON the POWER button on a real Genesis. This will completely reinitialize the genesis virtual machine.

LOAD NEW GAME

Here you can choose to load a rom either from a SDCARD (SLOT A or SLOTB) or a DVD and a file selection menu should appear.

In this new selection menu, the following controls can be used:

- A button : load the selected file
- B button : go up one directory
- Z button : quit the file selection menu
- L/R triggers : go down/up one full page
- Left/Right buttons or Analog stick : scroll the selected entry's filename when it can't be full displayed
- Up/Down buttons or Analog stick : select previous/next file

If you are using SDCARD, the program will look for a folder named "**/genplus/roms"**.

FILE MANAGEMENT

Let you managed SRAM and FreezeState files:

- **SRAM Manager**: Let you load/save SRAM data from/to the selected device
- **STATE Manager**: Let you load/save FreezeState data from/to the selected device

For each submenu, you can now choose the device type and location. Be sure to set this according to your system configuration before saving/loading files.

- **DEVICE**: Let you choose the device to use (SDCARD or MCARD).
- **SLOT**: Let you choose which MCARD slot to use for the device

when using NGC Memory Card in SLOTA, some mounting errors may occur. In this case, remove and insert the Memory Card again before trying to save/load anything. Be sure to have also enough space on the Card before trying to save something (Freeze State and SRAM files are usually compressed). when using SDCARD, the directory **/genplus/saves** must exist. Wii users should also note that the SD slot can NOT be acceeded, you need to use a SD-Adapter into one of the Memory Card Slot.
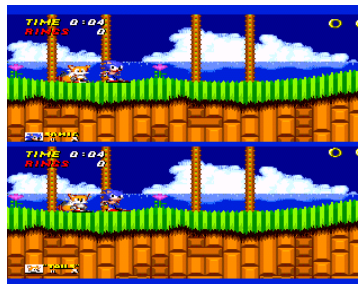
EMULATOR OPTIONS

Video Options

Aspect let you choose the Display Aspect Ratio:

- <u>ORIGINAL</u> mode automatically set the correct aspect ratio exactly as if you connected a real Genesis/Megadrive on your TV. When using this mode, the full resolution (720 x 480 or 720x574 pixels) is used to include horizontal and vertical borders around the active display area.
- <u>FIT SCREEN</u> mode let you adjust horizontal and vertical scale values so that the active display fits your TV screen. When using this mode, the resolution width is fixed to 640 pixels and borders are not emulated.

Render let you choose the Display Rendering mode:

- <u>ORIGINAL</u> let you use the original Genesis/Megadrive rendering modes: these modes generally output a progressive 240 lines (288 lines for PAL) display. Interlaced modes (240i/288i), used in Sonic 2 (2 players mode) for example, are also supported and automatically detected. In this mode, games should look exactly as they did on the real hardware.
- <u>BILINEAR</u> vertically scales (using hardware filtering features) the original display to a 480 lines (574 lines for PAL) interlaced display. In this mode, because of the higher resolution, games generally look better than on the real hardware but some artifacts might appear during intensive and fast action.

TV Mode let you choose the TV Mode to use:

- <u>50/60Hz</u>: in this mode, the Gamecube automatically switch into the appropriate PAL (50hz) rendering mode when the Genesis is set to run in PAL mode. This makes PAL games looking like they did on a real PAL Megadrive. Be sure to use this mode only if your television supports PAL (50Hz) signal.
- <u>60Hz</u>: in this mode, the Gamecube always use a 60Hz (NTSC or PAL60) rendering mode.

Overscan let you enable/disable the border colour emulation: when ON, the background colour is used (like on a real Genesis/Megadrive). When OFF, borders are forced to black. When ASPECT mode is set to MANUAL, this option is automatically set to OFF. On the other way, enabling this option automatically set ASPECT mode to ORIGINAL.

Center X/Center Y let you adjust the screen position while keeping the display aspect ratio.

Scale X/Scale Y let you adjust the display aspect ratio. This option is only accessible when using MANUAL aspect mode.

Audio Options

PSG Volume let you adjust the global volume level for the PSG output (0~200%)

FM Volume let you adjust the global volume level for the FM output (0~200%)

Boost Volume let you modify the overall sound level (0~4x). This could be useful when adjusting FM and PSG relative levels.

> Setting those values too high may produce some bad effects. Default values depends on the current selected FM & PSG core and are automatically set when switching between cores (see below).

HQ YM2612 is only used when selecting Gens FM core: when ON, the YM2612 is emulated at the original frequency, resulting in more accurate sound rendering.

SSG-EG is used to enable/disable the SSG envelope emulation. This feature exists on real YM2612 but is actually not properly emulated. Some games may sound weird when it's activated, where as others may need this to sound correctly.

FM CORE let you choose which YM2612 emulation core to use, both have specific issues with some games:

- GENS is the core used in Gens, a famous Genesis emulator for PC platforms
- MAME is the one used in the M.A.M.E emulator (default)

System Options

Region let you force the region setting for the Genesis system (This is also used to force PAL or NTSC timings):

- AUTO: original game region is automatically detected through ROM header when loading the game
- EUR (europe PAL)
- USA (usa NTSC)
- JAP (japan NTSC)

Some games may display various things depending on the selected Region setting but also may not work correctly if they have some internal region detection code.

VDP Latency is used to be more accurate in term of VRAM access timing, it is required by some games (Chaos Engine, Double Clutch,...) to be displayed properly (ON by default)

DMA Timing is used to be more accurate in term of VDP DMA timing, it is required by many games (Legend of Galahad...) to be displayed properly (ON by default)

Force DTACK can be useful to prevent games accessing illegal memory area to lockup the system (as it indeed happens on the real hardware). When this option is enabled, the system continues to run even if an illegal area has been acceded (example: "Sonic Crackers" prototype).

Autoload SRAM let you enable/disable automatic SRAM loading when a new game has been loaded. The detection order is MCARD (SLOTA) > MCARD (SLOTB) > SDCARD (SLOTA) > SDCARD (SLOTB),

TMSS BIOS let you enable/disable Genesis BIOS support at startup. If you want to use this feature (this is not required to play games), the BIOS ROM (not provided) must be renamed as *gen_bios.bin* and placed on the SDCARD, in the */genplus root directory*.

SVP Cycles let you adjust the number of CPU cycles per line to run for the emulated SVP chip used in Virtua Racing. This additional CPU consumes a lot of resources so you can lower the default value to improve the emulation framerate. Although, keep in mind that the SVP chip will also be running slower, which will result in slower 3D rendering.

Joypads Configuration

Here you can remap all 6 buttons, and adjust the Analog stick sensitivity (a lower value being more sensitive). Note that the Analog Stick is also used when emulating the Sega Menacer lightgun, so you may want to reduce the sensibility when playing the Menacer 6-in-1 game.

TYPE let you choose the type of the emulated Genesis gamepads (3-Buttons or 6-Buttons) : Genesis Plus automatically detects and set this option if the current game supports 6-Buttons but you can also force 3-Buttons gamepads if you want:

- 3BUTTONS: use classic Genesis controllers
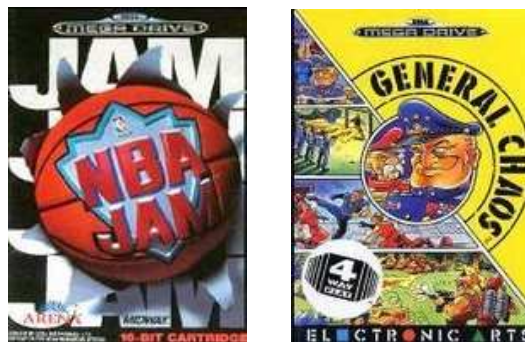- 6BUTTONS: use 6-Buttons Genesis controllers

PORTA and **PORTB** let you choose which type of device to be plugged in each two Genesis input ports:

- GAMEPAD: single gamepad (3 or 6-buttons, see above)
- MULTITAP: multiplayer adapter (Sega Teamplayer or EA 4-Way Play)
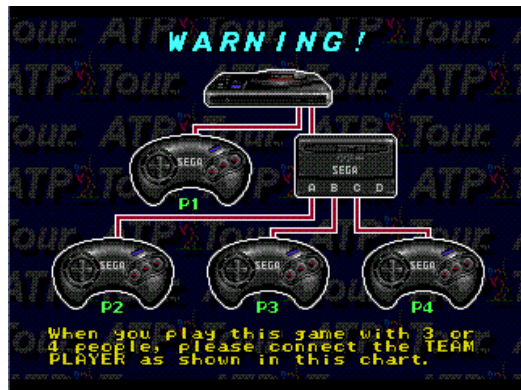- NONE: unplugged

Changing Controller Type or Port settings will reset the current game.
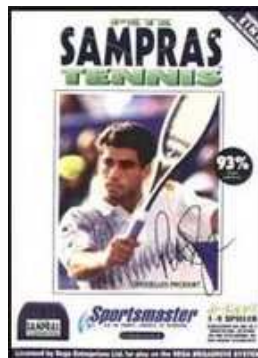
Some notes about Peripherals:

- MULTITAP is disabled by default. Only activate it with games supporting one of the following multiplayer adapters: actually, *EA 4-Way Play* and *Sega TeamPlay* adapters are fully supported.

- Most multiplayer games will work with MULTITAP plugged in PORTA but some of them require a GAMEPAD to be plugged in PORTA and the MULTITAP to be plugged in PORTB. MULTITAP could be plugged in both ports but only games supporting more than 4 players can take advantage of this configuration. As we only have 4 controllers max. on the Gamecube, only the 4 first gamepads will effectively been seen as plugged.

J-CART games (Micromachines games, Pete Sampras games, Super Skidmarks) use a built-in adapter to enable 2 additional gamepads to be plugged and are not compatible with any of the above adapters. So, do not activate MULTITAP with those games, they are automatically detected by the system which configure itself to enable up to 4 players support.

- When the 6-in-1 Menacer game is detected, PORTA is forced to NONE and PORTB forced to MENACER, you can not change those settings until another rom is loaded (previous settings will be restored). The only Genesis game that requires Sega Menacer lightgun support is the Menacer 6-in-1 game. Menacer input is automatically activated when you load this particular game: use the analog stick and be sure to activate the crosshair within game when it's possible.

Game Genie Codes

This screen lets you enter up to eight Game Genie codes. Use the A key to select/release an entry and the B key to exit.

STOP DVD MOTOR

Stop the DVD motor and the disc from spinning during playtime

SYSTEM REBOOT

For users of SDLoad or PSOLoad, you can call this to go back. Otherwise, this will reboot your console system.