



Analogue Mega Sg Reference Manual

Analogue

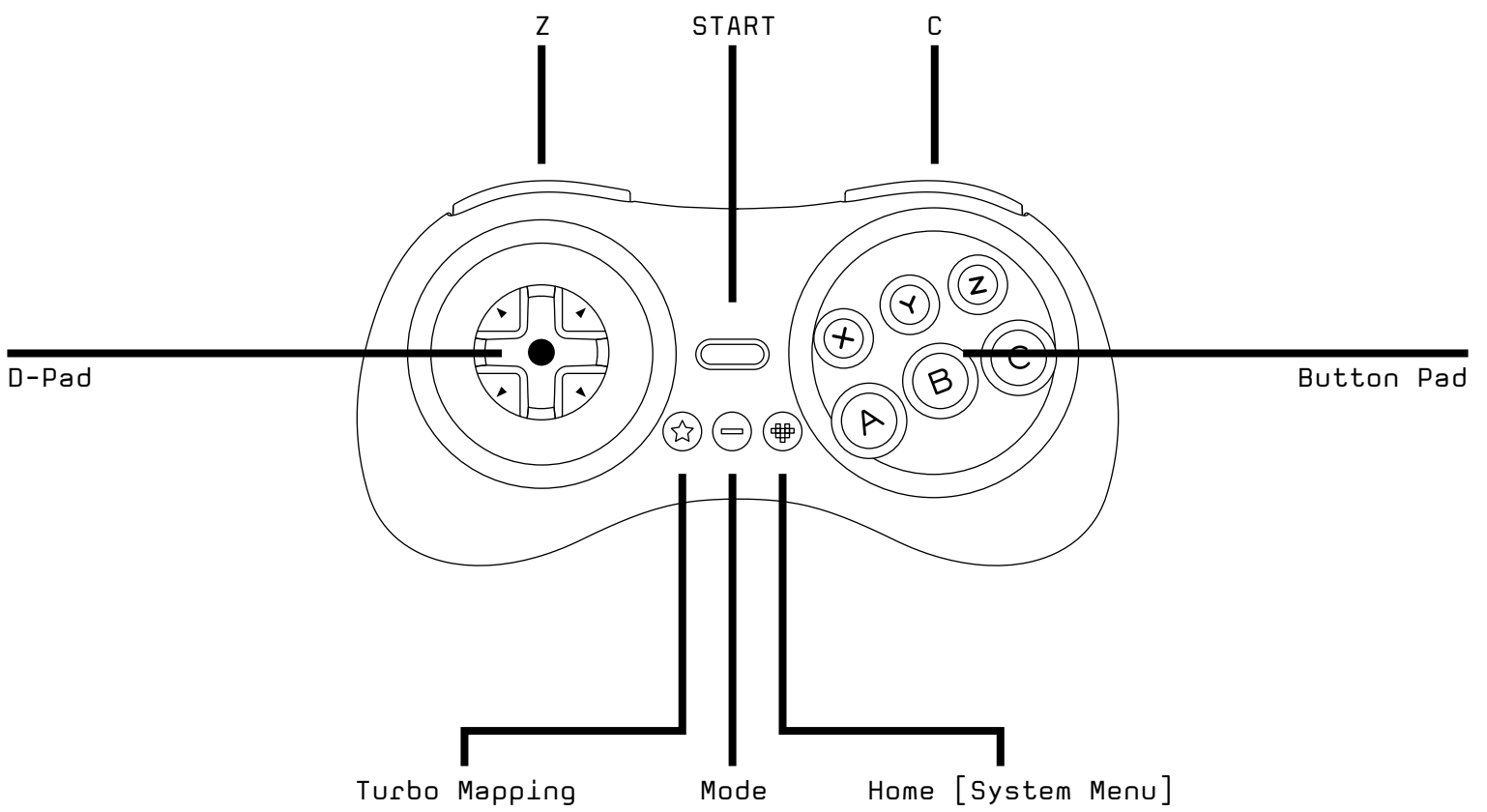
**Celebrate & explore the
history of video games with
the respect it deserves.**

Congratulations on becoming an Analogue Mega Sg owner.

A reimagining of the underdog that led a 16-bit revolution. Engineered with an FPGA. No emulation. 1080p. Zero lag. Total accuracy. Mega Sg is not a plug n' play toy. Compatible with the 2,180+ Sega Genesis, Mega Drive and Master System game cartridge library. Explore and re-live one of the greatest video game systems of all time with no compromises.

What's in the box

- Analogue Mega Sg
- Analogue Sega Master System game cartridge adapter
- Sega CD / Mega CD spacer
- Ultracore (digital)
- HDMI cable
- USB cable
- Worldwide USB Power Supply [100-240v, 50/60hz, USA/JPN plug-type]



Setting Up Mega Sg

- 1 Plug your micro-USB cable into your USB Charger
- 2 Plug your micro-USB cable into Mega Sg
- 3 Plug your USB power supply into a working AC Outlet
- 4 Plug one end of your HDMI cable into your Mega Sg
- 5 Plug the other end of your HDMI cable into your TV/Monitor/Capture Device
- 6 Plug in a Genesis/Mega Drive-compatible controller into Controller Port 1
- 7 Insert a cartridge into the cartridge slot (optional)
- 8 Push the Power Button

Updating the Firmware

Before playing your Mega Sg, make sure to update to the latest firmware at support.analogue.co. You will need a FAT16 or FAT32 formatted SD card to update the firmware.

In order to update the firmware, copy the latest firmware update file at support.analogue.co (with a .bin extension) to the root directory of your SD card. Make sure no other firmware files are in the root directory. Insert your SD card into the SD card slot on your Mega Sg and turn the power on. The firmware update process will start automatically and takes approximately three minutes to complete. During that time the power LED will flicker red at the screen will be blank. When the process is complete the LED will show a steady color and you will see the Animated Mega Sg Startup logo. Do not power off Mega Sg while the firmware is updating. If the power goes off for any reason, Don't Panic! The system may not display anything but it will look for a firmware file to flash to once the power is restored. You cannot brick your Mega Sg with a failed firmware update.

When you update firmware, all settings are reset to their defaults. Take notes of your settings prior to updating.

Setting Up Mega Sg with Sega CD or Mega CD

To connect Mega Sg to a Sega CD or Mega CD, you must remove the Expansion Slot connector from the right side of the console. Put the Sega CD spacer underneath Mega Sg to raise its connector to a height which will match the Sega CD's connector. The Sega CD comes with its own power adapter and must be plugged into the back of the Sega CD.

Notes on Power

While any charger that can supply 5v/2A will work with Mega Sg, including a car charger, it is recommended to use the included high quality USB-to-micro USB cable.

Setting up your TV for perfect retro gaming

If your TV has a low-lag or Game Mode, enable it. Otherwise turn off all processing features on your TV or it may negatively effect gameplay and latency.

Default Controller Key Assignments & Hotkeys

Down + Start — Enter/Leave Menu

Entering the Menu may not pause a game and blocks controller inputs to the game, Leaving the Menu returns to a game in progress and returns controller inputs to the game.

Up + Start + A + B + C — Reset

Same as pressing the physical reset button, initiates a soft reset.

A — Confirm/Select Menu Option Key

B — Cancel/Back Key

C — Exit Menu and Return to Game

Main Menu Options

Run Cartridge

Performs a Cold Reset (CPU registers and memory is reset) and runs the cartridge in the cartridge slot. This can be a Genesis/Mega Drive cartridge or, with the appropriate cartridge adapter, a Sega Master System cartridge, a Sega Card/MyCard, or a Sega Game Gear cartridge. The system will load the appropriate core automatically if the cartridge is not a Genesis cartridge. This option is also used to startup the Sega CD if one is attached to Mega Sg.

Play Ultracore

Allows you to play the previously unreleased game Ultracore (formerly known as Hardcore) built into Mega Sg.

Settings

Allows you to adjust the video, audio or system options, save settings and view the credits.

Tools

Allows you to enter Game Genie-style cheat codes and test your controllers using the built-in Analogue controller test program.

Compatible Cartridges

- Official Sega/Manufactured and approved Genesis/Mega Drive cartridges (all regions)
- Codemasters J-Cart Cartridges
- Sonic & Knuckles Lock-On Cartridge
- Virtua Racing 2
- Unlicensed/Homebrew/Reproduction/Pirate Genesis/Mega Drive cartridges
- Sega Master System Cartridges with included Analogue Master System Adapter, Master System Converter II, Power Base Converter, Power Base
- Mini or Power Base Mini FM
- Sega Game Gear Cartridges with Analogue GG Adapter (sold separately)
- Sega SG-1000 Cartridges with SG-1000 adapter (sold separately)
- Sega Mark III, Japanese Sega Master System and Sega SG-1000 cartridges with Analogue Mark III/SG-1000 Adapter (sold separately)
- Sega Card/MyCards with Analogue Card Adapter (sold separately)
- Sega Genesis/Mega Drive Game Genie
- Krikzz Mega EverDrive v1, v2/X7, X5 & X3, EverDrive MD v1-v3
- TerraOnion Mega SD

Compatible Controllers & Peripherals

- Official and aftermarket Genesis/Mega Drive controllers (all regions, all varieties including 3 button and 6 button controllers)
- Official Sega Mouse and Mega Mouse
- Sega Activator
- Sega Team Player & Electronic Arts 4 Way Play Multi-taps (never attach anything other than a wired regular Genesis/Mega Drive controller to a multi-tap)
- 8BitDo Retro Receiver & M30 Wireless controllers
- Sega CD Models 1 & 2
- Zero Tolerance Link Cable
- Miracle Piano (with Sega Genesis/Mega Drive Adapter)
- Sega 32x (with Analogue DAC, sold separately)

Settings Menu Structure & Outline

Factory Default Settings for each option are highlighted. If the option is not highlighted, then it is not enabled with the Factory Default Settings. If there is a range given to a particular option, then the default value for that range is highlighted after the range limits are given.

A Video	c Single Buffer	C System	d PAL Extra (PAL Domestic)
1 Resolution	8 Color (not shown unless Advanced Mode is enabled)	1 Menu Options	e Auto Region Detection
a 480p60	a Limit RGB Range	a Skin	f Force 3 Button Mode
b 720p60	b Lock Gamma Sliders Together	i USA	g YM3438 Busy Behavior
c 1080p60 (assuming your display supports this resolution)	c Red (1.00-1.99, 1.00)	ii EUR	h SD Card Speed
d 480p50	d Green (1.00-1.99, 1.00)	iii JPN	i Normal Speed
e. 720p50	e Blue (1.00-1.99, 1.00)	b Highlight Style	ii Fast
f. 1080p50		i Solid	iii Faster
		ii Swipe	g Debug
2 Width & Height (when Advanced Mode is enabled, otherwise Screen Size)	9 DAC RGB Mode	iii Flash	i Disable YM2612 Channels
a x320 width (depends on resolution, 1337 for 1080p)	a RGB Composite Synch	iv Rolling	1 0
b x256 Width (depends on resolution, 1377 for 1080p)	b RGB Separate Synch	v Throb	2 1
c Horizontal Position (depends on resolution, 38 for 1080p)	c RGB Synch on Green	c Highlight Color	3 2
d Height (depends on resolution, 1080 for 1080p)		i Chlorophyll	4 3
e Vertical Position (depends on resolution, 50 for 1080p)	B Audio	ii Quinoline	5 4
f Link x320 and x256 sliders	1 Headphone Settings	iii Fast Green	6 5
	a Headphone Volume (0-50, 32)	iv Petent Blue V	ii Disable PCM Audio
3 Screen Size (when Advanced Mode is disabled)	b High Impedance Phones	v Spirulina	iii Show IRQs
a 1:1	2 Channel Levels	vi Brilliant Blue	iv Show Display Enable
b Square Pixels	a YM2612 L (0-100, 100)	vii Anthocyanin	v Highlight Scanline
c 4:3 for 16:9	b YM2612 R (0-100, 100)	viii Indiotine	1 Scanline Number (0-255, 0)
d 4:3 for 16:10	c Square 1 (0-100, 40)	ix Phloxine	vi Highlight Pixel
e 4x Height (1080p only)	d Square 2 (0-100, 40)	x Carmine	1 Pixel Number (0-359, 0)
f 4.5x Height (1080p only)	e Square 3 (0-100, 40)	xi Carotene	
g 5x Height (1080p only)	f Noise (28-100, 36)	xii Tartrazine	5 LED Options
4 Scalers	3 Channel Panning	xiii Titanium Dioxide	a Standby Color
a No Scaler	a YM2612 L (-100-100, -84)	xiv Aluminum Oxide	b Center Pixel
b HQ2x	b YM2612 R (-100-100, 84)	d Font	c K-Pro Rainbow
c HQ3x	c Square 1 (-100-100, 0)	i Alternate Font	d Load Custom Pattern
d HQ4x	d Square 2 (-100-100, 0)	ii Upper Case	i File Browser
e Scale 2x	e Square 3 (-100-100, 0)	iii Mixed Case	e Adjust Pattern
f Scale 3x	f Noise (-100-100, 0)	iv Lower Case	i Animate Pattern
g X-Ray		v User Loaded Font	ii Animate Speed (0-31, 16)
h DVI Mode	4 -3db Output Cut	vi Load Font from SD Card	iii Pattern Position (0-255, 0)
i Disable H Interpolation 320x	5 Enable Cartridge and CD Audio	1. File Browser	f LED Brightness (0-31, 8)
j Disable H Interpolation 256x	6 Automatically Enable CD Audio	e Menu Bounce	g Standby Color Adjust:
k Disable V Interpolation	7 Swap Left & Right	f Dim Game in Menu	i Red (0-255, 255)
5 Scanlines	8 Cartridge Audio Volume (0-255, 42)	2 Hotkeys	ii Green (0-255, 255)
a No Scanlines	9 Advanced Filter Setting	a Reset Hotkey	iii Blue (0-255, 255)
b Normal Scanlines	a Use Lowpass Filter	i Left	D About
c Hybrid Scanlines	b Cutoff Frequency (100-20000, 4600)	ii Right	1 Special Thanks
d Normal Scanline Depth (0,100,0)	c Rolloff Rate (1-253, 28)	iii Down	2 Licensing
e Scanline Width (0-48, 8)	d Filter the following:	iv Up	
f Scanline Sub-Brightness (0-255, 255)	i Cartridge & CD Audio	v Start	E Save/Clear Settings
6 Extra Features	ii YM2612 L	vi A	1 Save Settings
a Mask Top and Bottom Borders	iii YM2612 R	vii B	2 Restore Factory Defaults
b Mask Left and Right Borders	iv Square 1	viii C	
c Enable Dither Blending	v Square 2	c Disable Hotkeys	
b Dither Blending Depth (0-63, 0)	vi Square 3	d Passthrough Mode	
7 Buffer Mode (not shown unless Advanced Mode is enabled)	vii Noise	3 Startup Options	
a Fully Buffered	10 Ladder Effect Depth (0-31, 0)	a Boot Sequence Delay (1-10, 4)	
b Zero Delay	11 YM2612 High Quality Mode	b Title → Menu	
	12 YM2612 Waveform (0-31, 0)	c Title → Cartridge	
		d Menu Direct	
		e Cartridge Direct	
		4 Hardware	
		a USA (NTSC Export)	
		b Japan (NTSC Domestic)	
		c PAL Regions (PAL Export)	

Video Settings

Resolution

480p modes set a resolution of 640×480
(no widescreen borders are added to the signal)
720p modes set a resolution of 1280×720
1080p modes set a resolution of 1920×1080.

50p is intended for European and Australian PAL games, all Japanese, American, South Korean and Brazilian games use the NTSC 60p frame rate. If you see visual artefacts like tearing (assuming the single buffer mode is off) or stuttering, check here to make sure your refresh rate matches the refresh rate of the game's region. This setting should be used in conjunction with the Hardware settings in the System Submenu.

Mega Sg supports EDID (Extended Display Identification Data) over HDMI. The display will send EDID information over the HDMI cable telling Mega Sg what display modes it supports. You may get an unsupported display mode to work, but if you do not, you may end up with no picture. Some NTSC displays may not report 50p support but will work with some or all 50p resolutions anyway. Almost all European displays support 60p. Mega Sg will start up with the highest resolution and frame rate your monitor supports unless you select a lower resolution setting and save the settings.

The Sega Genesis/Mega Drive could display four resolutions. The main resolutions are 320×224 and 256×224 pixels, with the former being more common. Games can and sometimes do switch resolutions from screen to screen. There are also interlaced versions of these resolutions supporting 320×448 and 256×448 at 60/50 fields per second. 320×448 is used for Sonic 2's 2-Player Vs. Mode and Combat Cars 2-Player mode. 256×448 is used for SeaQuest DSV's submarine navigation scenes. PAL games could also use 240-line/480-interlaced line modes.

Mega Sg uses integer scaling increments of 272 pixels for the 256 pixel mode and 340 pixels for the 320 pixel mode. Mega Sg's scaler always includes 8 pixels on the left and right border in 256 pixel mode and 10 pixels on the left and right border in 320 pixel mode. 8 lines of top and bottom borders, except when approaching a 5x vertical scale, can be shown when games use 224 lines.

If you select a resolution that does not work, you may see a black screen. You can still access the menu and may be able to walk back your steps to select a working resolution. If you cannot, then turn off the console and press the reset button as you press the power button. Release the reset button and your console should boot up in 480p mode, which is the most compatible mode supported by Mega Sg.

Video Settings

Width & Height

1. 480p Options

Minimum/Maximum Width (Horizontal Pixels):
340/640 Horizontal Presets (at 288) :
x320 Width – 340 (1x320); 408 (Square Pixels); 640
x256 Width – 340; 408 (Square Pixels); 544 (2x256)

Horizontal Presets (at 1.5x) :
x320 Width – 340 x320 Width – 340 (1x320);
344 (4:3 for 16:9); 360 (1:1); 382 (4:3 for 16:10); 510
(Square Pixels); 640

x256 Width – 340; 344 (4:3 for 16:9); 360 (1:1); 382
(4:3 for 16:10); 510 (Square Pixels); 544 (2x256)

Horizontal Presets (at 2x) :
x320 Width – 340 (1x320); 459 (4:3 for 16:9); 480
(1:1); 510 (4:3 for 16:10); 640

x256 Width – 340; 459 (4:3 for 16:9); 510 (4:3 for
16:10); 544 (2x256)

Minimum/Maximum Height (Vertical Pixels) :
288/480
Vertical Presets : 288, 360 (1.5x), 480 (2x)
Horizontal Position : 0-128
Vertical Position : 0-64

2. 720p Options

Minimum/Maximum Width (Horizontal Pixels) :
680/1280

Horizontal Presets (at 2x Vertical) :
x320 Width – 680 (4:3 for 16:10) (2x320); 1020
(3x320); 1280

x256 Width – 680 (4:3 for 16:10); 816 (3x256); 1088
(4x256)

Horizontal Presets (at 2.5x Vertical) :
x320 Width – 680 (4:3 for 16:10) (2x320); 1020
(3x320); 1280

x256 Width – 680 (4:3 for 16:10); 816 (3x256); 1088
(4x256)
x256 Width – 680; 765 (4:3 for 16:9); 816 (3x256);

849 (4:3 for 16:10); 850 (Square Pixels); 1088
(4x256)

Horizontal Presets (at 2.5x Vertical) :
x320 Width – 680 (2x320); 720 (1:1); 765 (4:3 for
16:9); 849 (4:3 for 16:10); 850 (Square Pixels); 1280

x256 Width – 680; 765 (4:3 for 16:9); 816 (3x256);
849 (4:3 for 16:10); 850 (Square Pixels); 1088
(4x256)

Horizontal Presets (at 3x Vertical) :
x320 Width – 680 (2x320); 720 (1:1); 918 (4:3 for
16:9); 1019 (4:3 for 16:10); 1020 (Square Pixels)
(3x320); 1280

x256 Width – 680; 720 (1:1); 816 (3x256); 918 (4:3 for
16:9); 1019 (4:3 for 16:10); 1088 (4x256)

Minimum/Maximum Height (Vertical Pixels) :
480/720
Vertical Presets : 480 (2x), 600 (2.5x), 720 (3x)
Horizontal Position : 0-128
Vertical Position : 0-64

3. 1080p Options

Minimum/Maximum Width (Horizontal Pixels) :
1020/1920

Horizontal Presets (at 4x Vertical) :

x320 Width – 1020 (3x320); 1224 (4:3 for 16:9); 1360
(4:3 for 16:10) (4x320); 1700 (5x320); 1920

x256 Width – 1020; 1088 (4x256); 1224 (4:3 for
16:9); 1360 (4:3 for 16:10) (5x256); 1632 (6x256);
1904 (7x256)

Horizontal Presets (at 4.5x Vertical) : x320 Width –
1020 (3x320); 1080 (1:1); 1360 (4x320); 1377 (4:3 for
16:9); 1530 (4:3 for 16:10); 1700 (5x320); 1920

x256 Width – 1020; 1080 (1:1); 1088 (4x256); 1360
(5x256); 1377 (4:3 for 16:9); 1530 (4:3 for 16:9); 1632
(6x256); 1904 (7x256)

Horizontal Presets (at 5x Vertical) :
x320 Width – 1020 (3x320); 1200 (1:1); 1360 (4x320);

1530 (4:3 for 16:9); 1699 (4:3 for 16:10); 1700 (Square Pixels) (5×320); 1920

x256 Width – 1020; 1088 (4×256); 1200 (1:1); 1360 (5×256); 1530 (4:3 for 16:9); 1632 (6×256); 1699 (4:3 for 16:10); 1904 (7×256)

Minimum/Maximum Height (Vertical Pixels) :

960/1200

Vertical Presets : 960 (4x), 1080 (4.5x), 1200 (5x)

Horizontal Position : 0-128

Vertical Position : 0-64

The Link x320 and x256 sliders option allows you to have separate width settings for the 320 pixel and 256 pixel modes. Except when using 1360 pixels, games using a 320 pixel mode will not have identically sized pixels in 256 pixel mode and vice versa.

Video Settings

Notes on Scaling

If you are outputting your Mega Sg to a 1080p or 4K native display and you care about seeing the vertical borders, then you should use 4x vertical scale. If you do not care then you should use a 5x vertical scale. Ideally, the Genesis/Mega Drive displayed 320 pixels in a 32:35 or .91:1 ratio and 256 pixels in a 8:7 or 1.14:1 ratio. A 5x scale gives you essentially a 320/256×216 unscaled resolution, so you can use the horizontal and vertical positions to adjust the graphics if any vital details are lost. Many games using the 320x resolution optimized their graphics for a 1:1 pixel aspect ratio.

Screen Size

In the simplified Screen Size setting, height settings are given only for 1080p modes.

Scalers

Several scalers are available if you wish to apply them. “No scaler” uses nearest-neighbor interpolation where the color of a pixel is repeated horizontally and vertically as often as is necessary to get to the desired scaled resolution. This results in the sharpest, “pixel purist” graphics but can leave

uneven horizontal pixels if the scaled resolution is not an integer multiple of the original resolution.

The HQ2x, HQ3x and HQ4x scalers interpolate a pixel based on the surrounding pixels. The result is generally a smoother image. The 2x, 3x and 4x refer to blocks of pixels, and the larger the block, the fewer colors will be used. Scale 2x and Scale 3x use a somewhat different algorithm but produce a similar result. X-Ray uses a simple algorithm to give inverted black and white graphics.

Using scalers may shift the image slightly, alter the colors considerably and will cause a little extra lag due to the processing of the image required.

Enable DVI Mode – This option can allow Mega Sg to connect to displays which only support the DVI standard. DVI does not carry audio and other data over its connection that HDMI carries. The extra data which HDMI provides can cause many DVI-only monitors to fail to display Mega Sg’s video. If you use this option, you must take audio from the headphone jack.

Disable H and V Interpolation - These options are useful with 8:7 and 4:3 for 16:9 or 16:10 modes with no scaler. These modes subtly blend the edges of pixels to make uneven nearest-neighbor scaled pixels less noticeable. It can also eliminate shimmer in scrolling backgrounds on LCD displays. Genesis/Mega Drive games can freely switch between 320 and 256 pixel screens, so shimmering will be more apparent than with a NES or a SNES without integer scaling or interpolation. If you are using a true integer horizontal or vertical scale, you should not need to use these options.

When the Disable Horizontal or Vertical Interpolation box is checked, that means the interpolation is NOT being applied to the video. You can set each form of interpolation independently and can set interpolation to be applied to 256-pixel graphics but not 320-pixel graphics or vice versa.

Video Settings

Scanlines

Mega Sg features an option for generating scanlines to capture the feel of a scanning beam structure in a CRT. Normal Scanlines dim pixels by the same amount regardless of the pixel's color. Hybrid Scanlines targets more realistic scanlines by adjusting for gamma when dimming a pixel's color. With hybrid scanlines, darker objects have thicker scanlines than brighter objects.

These options presented here, Normal Scanline Depth, Scanline Width and Scanline Sub-Brightness work in conjunction with each other to alter the display of the brightness of both the scan displayed and the gap lines simulated in between each scan of the displayed graphics. Scanline Sub-Brightness, must be set to a value above 0 before you will see any lines in between the graphics. This option will darken the line and by 255, the lines will be full black.

The first two options have little, if any effect in 480p mode. Their best utility is in the 1080p 4x and 5x modes. What they do is to alter the brightness of the scanned lines adjacent to the gap line in different ways. These options allow a finer gradient to the brightness of a scanned line's colors in relation to the gaps in between each scanned line than the previous scanline support Mega Sg provided. You can use these options to darken every third scanline in 720p mode, which may be the easiest way to obtain PVM-like scanlines.

If you use scanlines, you may need adjust the Vertical Position in the Width and Height setting from the current setting to allow the scanlines to align themselves with the top or bottom edge of each line of scaled pixels. Having scanlines bisect a scaled pixel is not ideal.

Extra Features

Mask Borders – The Genesis/Mega Drive would show colored borders on all four sides of the active display area in many games. NTSC CRTs would typically mask off most of these borders behind the screen bezel, but PAL CRTs usually showed at least some of the top and bottom borders.

Mega Sg can show these borders if you wish by turning off the masking for the top and bottom or left and right borders.

Enable CRAM Dots – This option allows you to view the CRAM dots, a graphical artifact often produced by original systems and can be viewed outside the active display area. They were not typically visible on a CRT display, but video captures and emulators sometimes show them.

Enable Dither Blending - Dithering was a commonly used technique on the Genesis/Mega Drive to blend colors of adjacent pixels. With an RGB display, the pixels would appear distinct and usually be in a pattern of alternating vertical lines or a checkerboard pattern where the pixels shift by one every scanline. However, most people played Genesis/Mega Drive through composite or RF video. Composite video lacks the bandwidth to show all pixels distinctly and will tend to blend alternating patterns of two colored pixels. Sometimes this was used as for transparency, other times it would be used to show a mixed color using the color directly generated by the console. The slider will adjust the detection Mega Sg uses to determine whether to blend pixels or not.

Buffer Mode

The buffering modes on Mega Sg address the issue that the Genesis/Mega Drive's native NTSC frame rate is 59.92275fps and the PAL rate is 49.70146fps. A CRT can display these frame rates with ease but modern displays and HDMI interfaces expect either 60fps, 59.94fps or 50fps and are generally not tolerant of refresh rates that vary from too far from the official frame rates. Mega Sg has three modes that deal with the frame rate differential in different ways.

Fully Buffered Mode buffers full frames to maintain the timing of a 59.92 frame rate using only 60fps. This mode avoids tearing at the cost of latency. Mega Sg must render at least 1 frame ahead of the game's internal rendering to stay ahead.

The Zero Delay speeds the simulated Genesis/Mega Drive up to achieve a true 60fps frame rate, a speed difference of 0.13% There is no latency penalty with this method but this method causes

Mega Sg to jump ahead by about 1 second every 10 minutes compared to an original Genesis/Mega Drive running the same software.

Finally, the Single Buffer option is something of a compromise between the two methods described above. Like the Full Buffer option, the correct timing is being generated within Mega Sg. Unlike the Full Buffer, only a portion of the next frame is being pre-rendered, giving latency of no more than 1 frame depending on when the player activates an input. The drawback is a recurring retrace line that is visible once per every several seconds.

Video Settings

Color

Limiting RGB Range adjusts the color output range to accommodate those displays which do not handle 24-bit RGB natively. Many LCDs found on TVs do not show a full range of RGB for each of the three primaries, red, green and blue. Each primary color is represented by an 8-bit value, giving 256 levels of color for each primary. Full RGB displays accept values of 0-255 for each color primary. Limited RGB displays only accept values of 16-235, with values below 15 being designated as black and values above 235 being designated as white. The identical RGB value will not produce the same color in limited RGB versus full RGB because limited RGB tries to cover the same color space as full RGB but has fewer values to cover the range.

You should use Full RGB if your display supports it. If you turn on the Limited RGB Option and see black turn to dark gray, then you should not use this option. If the black stays black, then keep this option on.

The Lock Gamma Sliders Together option disables your ability to set the gamma for Red, Green and Blue independently.

Red, Green & Blue sliders can be set from 1.00 to 1.99 in .01 increments. You may come close to the gamma of a CRT with the sliders at 1.20 without scanlines and 1.40 with scanlines.

DAC RGB Mode

This setting is only for use with Analogue DAC. If the current synch option is not compatible with your output device, you can use this setting in HDMI mode to select another option, then save settings and try the new option with Analogue DAC. See Analogue DAC Reference Manual for more information.

Advanced Mode

Enabling this option adds the Cropping, Extra Features, Buffer Mode, Color and DAC RGB Mode options to the Video Submenu and turns the simplified Screen Size options into the Width & Height options. Any options you select while using Advanced Mode options will remain in effect if the Simplified Menu is selected.

Audio Settings

All Sega Genesis/Mega Drive consoles include two internal sources of sound. The first is the six channel, Yamaha YM2612 OPN2 Four Operator Frequency Modulation Sound Generator. Later Genesis/Mega Drive consoles integrate a slightly different sounding YM3438 OPN2C. The second is an integrated recreation of the four channel Texas Instruments SN76489 Programmable Sound Generator. Mega Sg also includes a DAC to allow analog audio output via its headphone jack.

Headphone Output – Sets the volume level from the headphone jack.

High Impedance Phones – If you are using studio-grade headphones, select this option and Mega Sg will try to provide the power necessary to drive those phones. If you are using earbuds or typically low impedance computer/gaming headsets, leave this option unchecked. If your headphone's impedance is above 50 Ohms, then select this option. If below 30 Ohms, leave it unchecked. Between 30 and 50 Ohms, see which setting works best for you. You will notice an increase in the loudness of the audio with this item checked.

Channel Levels – Allows you to set the relative volume levels of the FM and PSG sound sources. The FM is inherently stereo, panning its output left and right, so these outputs are affected. The PSG is dual mono, so each channel is given its own volume level. The default level should match a Genesis/Mega Drive Model 1 with a discrete YM2612.

Channel Panning – Allows you to pan channels left and right relative to center. The original YM2612 has stereo output, so these panning sliders can influence the inherent separation. The original chip does have a certain amount of audio bleed. The original PSG does not have stereo capabilities, so this is an added feature. Set the sliders to 0 to make the sound source mono.

-3db Output Cut – Some monitor embedded speakers and soundbars clip or cannot recognize a full-volume signal. This option reduces the volume to reduce the peaks below their maximum amount (0db). Try enabling this option if you are not hearing any sound or hearing clipping sound from Mega Sg.

Enable Cartridge & CD Audio – This option must be turned on to hear audio from the Sega CD via Mega Sg. Use this option to enable expansion audio from a device like the Power Base Mini FM or the Mega EverDrive v2/X7. This option will allow you to use a real YM2413 audio chip or another simulation of that chip for Sega Master System games if you prefer that audio over Mega Sg's built-in YM2413. This option must be turned on to hear audio from the Sega CD via Mega Sg. Otherwise you should disable this option if you are not using one of the above because the audio inputs can pick up bus noise.

Automatically Enable CD Audio - This option will automatically enable CD audio from the Sega CD to be mixed with Mega Sg's audio if a Sega CD is connected.

Swap Left & Right – This option reverses stereo.

Cartridge & CD Audio Volume – Sets the volume of the expansion audio.

Advanced Filter Settings

Use Lowpass Filter – This allows you to apply a lowpass filter to the audio output. You may wish to use this to attenuate the higher frequency components of FM audio. The slider allows you to specify a cutoff frequency from 100-20000Hz in 100Hz steps. If you go too low the sound will start to sound muffled. The low pass filter is a 256-order low pass, so the cutoff frequency will sharply attenuate audio above the set frequency.

Rolloff Rate - The rolloff rate is given with a number representing the db reduction in volume over a decade. The default value is 28db/decade

Ladder Effect Depth – This effect is sometimes called DAC Noise, because the YM2612 sends its six FM channels to its internal DAC sequentially, there can be unnecessary noise or crossover distortion produced when the audio is output. Some games had their audio designed with this in mind and sound less punchy when played in a system with a YM3438, which almost totally eliminates the effect. After Burner II is the classic example, set the level to 4 or 5 to get a more analog sound when playing that game.

Audio Settings

YM2612 High Quality Mode – The YM2612's waveforms are expressed digitally using 14 bits, but they are truncated to 9 bits when sent to the internal DAC. When this Mode is turned on, the 14 bit waveforms are not truncated, producing a higher quality sound. This option is likely to be appreciated with high amplitude audio where 9 bits are insufficient to express the full dynamic range of which the audio is capable.

YM2612 Waveform – FM Synthesis works by one or more waveforms modulating one or more other waveforms. The YM2612 can only use a regular sine wave, but other FM synthesizers like the YMF-262 could use other waveforms. By setting the value of this parameter to something other than 0, you can use many other waveforms for modulation:

0	Sine Wave
1	Half Sine
2	Rectified Sine
3	Quarter Sine
4	2x Sine
5	2x Rectified Sine
6	Square Wave
7	Exponential Wave
8	Clipped Sine
9	Half-Period Clipped Sine
10	Rectified Clipped Sine
11	Clipped Quarter Sine
12	2x Clipped Sine
13	2x Rectified Clipped Sine
14	Clipped Half Square
15	Half Exponent
16	Triangle Wave
17	Half Triangle
18	Rectified Triangle
19	Quarter Triangle
20	2x Triangle
21	2x Rectified Triangle
22	2x Rectified Square
23	2x Rectified Exponent
24	Sawtooth Wave
25	Half Sawtooth
26	Rectified Sawtooth
27	Quarter Sawtooth
28	2x Sawtooth
29	2x Half Sawtooth
30	2x Half Square
31	Half Exponent

The resulting sound may vary considerably from what was intended, so the setting won't be saved when you Save Settings.

System Settings

Menu Options

Skin – Use the Cartridge graphic and Highlight color appropriate for the region selected.

Highlight Style – Used to indicate the current menu option.

Highlight Color – Used to determine the color of the current menu option.

Font – Changes the menu font, Alternate Font uses a thicker, standard 8x8 font instead of the default font.

The user loaded font allows you to select your own font in place of those which come with Mega Sg. The load font option will bring you to the file browser. If you have a directory called FONT at the root of your SD card, it will default to that directory to load a font file. The font must use an 8x8 text box and must be represented in binary in a 1-bit per pixel format. Each character will take eight bytes to represent in this format. The file must be 768 or 1024 bytes in size and use the extension .fnt. The characters in the file will have to start at ASCII 20 (space) and end at ASCII 7F (delete). Font files 1024 bytes in size will not show the first 32 characters which would be stored in the first 256 bytes of that file.

Menu Bounce – The menus will drop down instead of instantly appearing.

Dim Game in Menu – The game will be dimmed when the menu is active, making it easier to see the menu options but more difficult to see the effects of changing video parameters.

Controls & Hotkeys

Reset Hotkey - You can use almost any combination of controller buttons and directionals for this option. You cannot use the Up and Down or Left and Right directionals at the same time. X,Y,Z and Mode buttons are not supported.

Menu Hotkey – You can use almost any combination of controller buttons and directionals for this option. You cannot use the Up and Down

or Left and Right directionals at the same time. X,Y,Z and Mode buttons are not supported.

Disable Hotkeys – If you wish to eliminate any accidental triggering of the hotkeys, you can use this option but you will not be able to return to the menu without power cycling the console. The state of this option will not be saved when you Save Settings.

Passthrough Mode – If you are having trouble with an unusual peripheral or wish to disable all Mega Sg controller compatibility processing and eliminate a tiny amount of latency required by that processing, enable this mode. You can disable the Passthrough Mode by pressing the reset button down for two seconds. The state of this option will not be saved when you Save Settings.

Startup Options

Boot Sequence Delay – This slider determines how much of a delay will be used before the screen will be activated. Some LCDs cannot handle information immediately available from the HDMI interface, so if you are not getting a picture you may want to add a little delay to give the display time to set up the picture parameters.

Title → Menu – Starts up directly with the Root Menu after showing the startup sequence.

Title → Cartridges – Starts any cartridge inserted in Mega Sg after showing the startup sequence

Menu Direct – Starts up directly with the Root Menu without showing the startup sequence.

Cartridge Direct – Starts any cartridge inserted in Mega Sg without showing the startup sequence.

System Settings

Hardware

USA (NTSC Export) – Use for Games released in North and South America
Japan (NTSC Domestic) – Use for Games released in Japan and South Korea
PAL Regions (PAL Export) – Use for Games released in Europe and Australasia
PAL Extra (PAL Domestic) – Extra option which is not used by licensed games

The Genesis/Mega Drive uses region locking where the cartridge reads the state of a pair of bits. In some consoles, the state of these bits can be changed by installing jumpers or a switch, and these options replicate this. However, the PAL options also set the speed and video timing to PAL-compatible settings, so changing these bits in mid-game may cause a game, which is currently running, to crash. These settings should be set in conjunction with 60p modes for NTSC and 50p modes for PAL in the Video Submenu.

By 1992, most games would display some kind of message when a console played a game from the wrong region and would refuse to progress. Some games just give a single color screen or, for companies such as Konami, just a generic logo. In that case, change the region to the correct region and reset.

Auto Region Detection will allow you to play a game even if the game is not correct for the region set by Mega Sg. When this option is active, it will show the Region the console is being forced to use below the option's text. The change in the region is only temporary and nothing will appear if the region matches the console's settings. Some games are multi-region, so Mega Sg prioritizes USA over Japan, then Japan over PAL Regions with this option.

Force 3 Button Mode

Some games will not function correctly with a 6 button controller, so use this option if you are experiencing controller difficulties. Most games which have difficulties with 6 button controllers on original hardware will work fine on Mega Sg. American Gladiators, John Madden Football, Ms. Pac-Man, Olympic Gold: Barcelona '92 and Second Samurai are examples of games which require this option to be enabled on Mega Sg.

YM3438 Busy Behavior

The YM3438 has slightly different behavior when telling the system that it is ready to receive data compared to the YM2612. A few games do not account for the varying behaviors and as a result the speed of their music may not be ideal. If this option is checked, then the music in Hellfire will run slower than intended. Earthworm Jim should have it checked, the music is slower than it should be with the YM2612's behavior.

SD Card Speed

This option allows for SD card access in the File Browser via three speed settings for loading files : Normal Speed, Fast and Faster.

Unless your SD card is really slow, you should be OK with Faster. Lower the speed down if you are having trouble loading Files.

Debug

Disable YM2612 Channels – Allows you to individually disable each of the YM2612's channels.

Disable PCM Audio – Turns off the sampled sound processing mode feature of Channel 5, FM audio, which is synthesized sound, will still be heard through Channel 5.

Show IRQs – Shows IRQs active on any scanline or portion thereof in red. The Genesis/Mega Drive can generate an IRQ on any scanline and can generate an IRQ on each scanline. IRQs are often used for advanced graphical techniques.

Display Enable – Will show a blue screen or blue area of the screen whenever the display is inactive. The Display can be enabled on any scanline. Disabling the display gives the programmer more resources to accomplish other tasks.

Highlight Scanline – Shows a green horizontal line on the line on the accompanying slider.

Highlight Pixel – Shows a green vertical line on the pixel column selected on the accompanying slider.

Debug

Disable YM2612 Channels – Allows you to individually disable each of the YM2612's channels.

Disable PCM Audio – Turns off the sampled sound processing mode feature of Channel 5, FM audio, which is synthesized sound, will still be heard through Channel 5.

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Highlight Scanline – Shows a green horizontal line on the line on the accompanying slider.

Highlight Pixel – Shows a green vertical line on the pixel column selected on the accompanying slider.

System Settings

LED Options

These options control the colors displayed by Mega Sg's RGB LED.

Standby Color – LED Color is solid White by default but can be freely adjusted with the Standby Color Adjust sliders.

Center Pixel – LED Color will be whatever the pixel in the center of the screen's color is. If you choose this option, you may not see the LED show color when the system turns on if you boot to the menu because the center pixel is black.

K-Pro Rainbow – LED Color cycles through the rainbow.

Load Custom Pattern – Allows you to load a custom pattern contained on the SD card. Will send you to a File Browser. Pattern files are 768 bytes in size.

Adjust Pattern – These options allow you to adjust the animation speed and position of the pattern selected in the previous menu.

Animate Pattern – Will disable animation and leave the LED set to the last displayed color if disabled. Equivalent to setting the Animate Speed to 0.

Animate Speed – Determines the speed at which the LED changes colors, higher numbers give faster transitions.

Pattern Position – Determines the currently displayed color within the pattern. Each pattern consists of 256 RGB values.

LED Brightness – Determines the brightness of the LED in a slider, 0 turns the LED off.

Save/Clear Settings

Save Settings – Saves menu settings to Mega Sg's internal flash memory.

Restore Factory Defaults – Restores Factory Defaults, so take notes of your settings prior to updating.

Tools

Cheat Codes

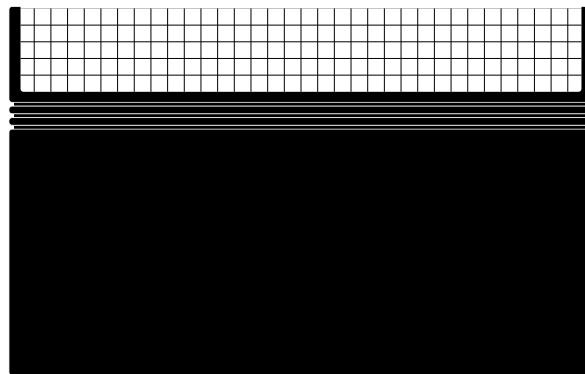
Enable Checked Codes – Activates and Deactivates Codes individually. Up to six standard Game Genie codes can be entered, Codes #1-#6. A code is entered by moving the D-pad to the box and pressing A to advance the numbers and letters. You can only go forward from A-Z & 0-9, not backward. Genesis/Mega Drive Game Genie codes do not use the letters I, O, Q or U.

Controller Settings

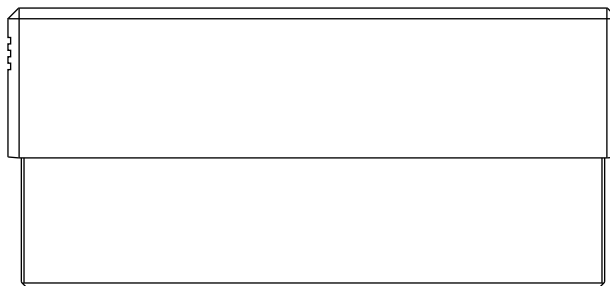
Runs a small program that lets you test the controller directionals and buttons

Playing Sega Master System Games

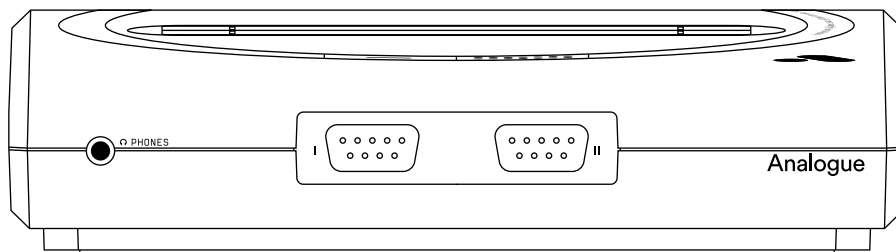
Included with your Mega Sg purchase the Master System adapter. With the Adapter you can play Sega Master System Cartridges in your Mega Sg.



Master System
Cartridge



Master System
Adapter



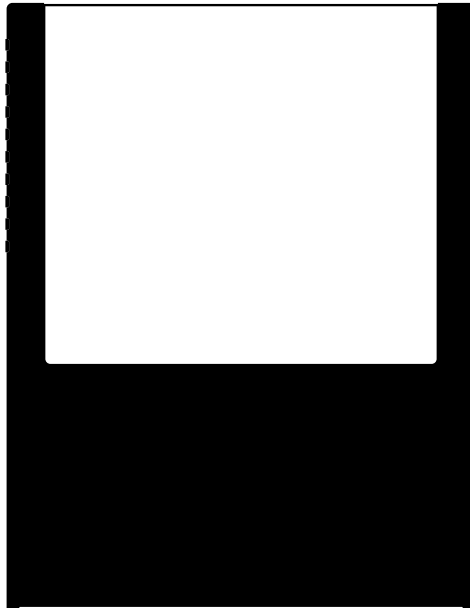
Mega Sg



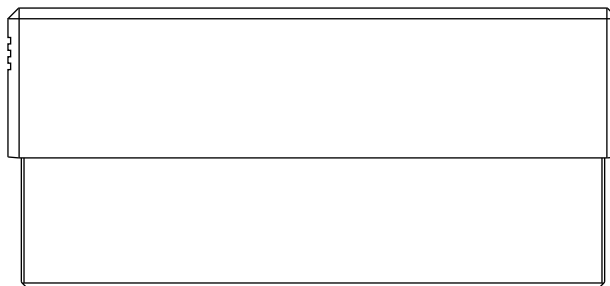
Sega CD Spacer

Playing Sega Mark III / SG-1000 / SC-3000 Games

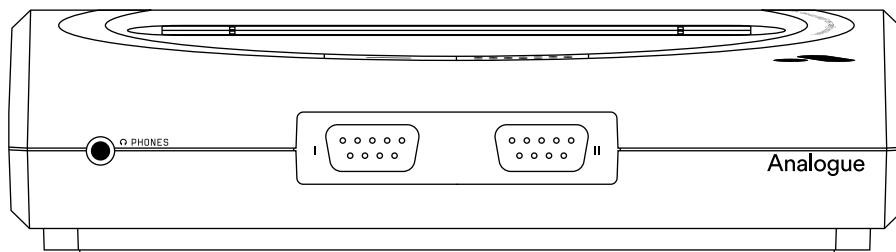
With the purchase of the Mega Sg Cartridge Adapter Set, you can use Mark III/SG-1000 Adapter to play Sega Mark III, Japanese Sega Master System and Sega SG-1000 Cartridges.



Mark III/SG-1000/
SC-3000 Cartridges



MKIII/SG1K
Cartridge Adapter



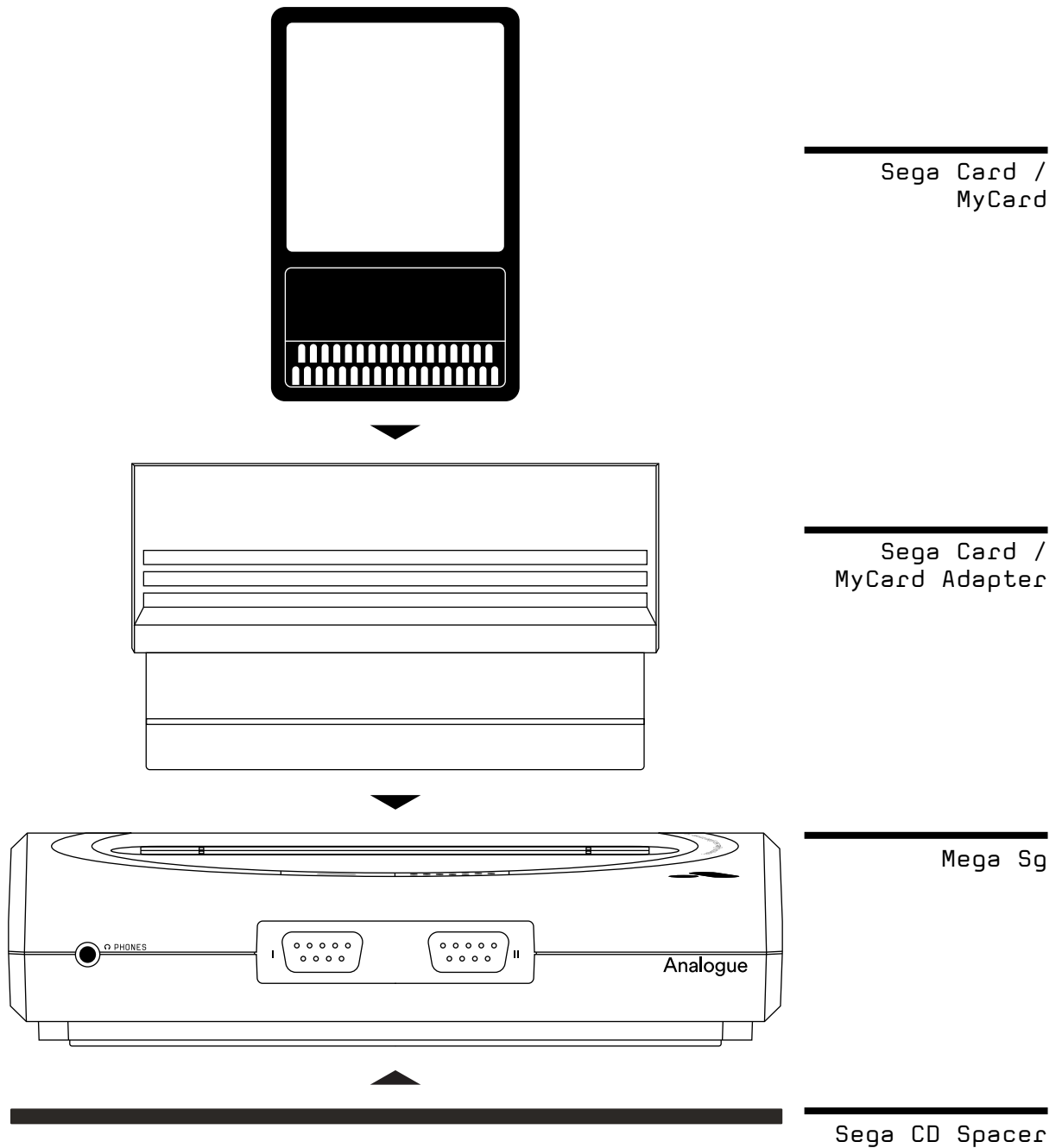
Mega Sg



Sega CD Spacer

Playing Sega Card / MyCard Games

The purchase of the Mega Sg Cartridge Adapter Set includes the Card Adapter so you can play Sega Cards/MyCards for the Master Systems, Mark III and SG-1000.



Master System Video Settings

The NTSC Master System only supports one video mode, 256x192. Many games will show solid-color borders above and below the active screen image for 48 lines. In addition, some games may mask the first left eight pixel columns and show the border color, giving an effective 248x192 resolution. Horizontal borders outside the 256-pixel active display area are not shown, so when you calculate horizontal scaling you must use 256-pixel increments. The PAL Master System adds a 256x224 resolution, but that resolution is only used in Codemasters' games.

Width & Height

1. 480p Options

Minimum/Maximum Width (Horizontal Pixels) :
384/640

Horizontal Presets (at 2x Vertical) : 384, 438 (4:3 for 16:9), 480 (1:1), 487 (4:3 for 16:9), 512 (2x), 548 (Square Pixels), 640

Minimum/Maximum Height (Vertical Pixels) :
480/480

Vertical Presets : 480 (2x)
Horizontal Position : 0-128
Vertical Position : 0-64

2. 720p Options

Minimum/Maximum Width (Horizontal Pixels) :
512/1280

Horizontal Presets (at 2x Vertical) :
512 (2x), 548 (Square Pixels), 585 (4:3 for 16:9), 650 (4:3 for 16:10), 768 (3x), 1024 (4x), 1280 (5x)

Horizontal Presets (at 2.5x Vertical) :
512 (2x), 600 (1:1), 685 (Square Pixels), 731 (4:3 for 16:9), 768 (3x), 812 (4:3 for 16:10), 1024 (4x), 1280 (5x)

Horizontal Presets (at 3x Vertical) :
512 (2x), 720 (1:1), 768 (3x), 822 (Square Pixels), 877 (4:3 for 16:9), 975 (4:3 for 16:10), 1024 (4x), 1280 (5x)

Minimum/Maximum Height (Vertical Pixels) :
480/720
Vertical Presets : 480 (2x), 600 (2.5x), 720 (3x)

Horizontal Position : 0-128

Vertical Position : 0-64

3. 1080p Options

Minimum/Maximum Width (Horizontal Pixels) :
768/1920 (1080 visible maximum)

Horizontal Presets (at 4x Vertical) :
768 (3x), 960 (1:1), 1024 (4x), 1097 (Square Pixels), 1170 (4:3 for 16:9), 1280 (5x), 1300 (4:3 for 16:10), 1536 (6x), 1792 (7x), 1920

Horizontal Presets (at 4.5x Vertical) :
768 (3x), 1024 (4x), 1080 (1:1), 1234 (Square Pixels), 1280 (5x), 1316 (4:3 for 16:9), 1462 (4:3 for 16:10), 1536 (6x), 1792 (7x), 1920

Horizontal Presets (at 5x Vertical) :
768 (3x), 1024 (4x), 1200 (1:1), 1280 (5x), 1371 (Square Pixels), 1462 (4:3 for 16:9), 1536 (6x), 1625 (4:3 for 16:10), 1792 (7x), 1920

Minimum/Maximum Height (Vertical Pixels) :
960/1200

Vertical Presets : 960 (4x), 1080 (4.5x), 1200 (5x)
Horizontal Position : 0-128
Vertical Position : 0-64

Cropping

Cropping is added to the Video menu to allow you to crop all four sides of the screen if you wish. If you wish to remove the top horizontal border, use 23, the bottom border, use 25 and the left side border, use 8.

Extra Features

Mask All Borders – Mega Sg's SMS Core can show when a game displays colored borders on the top and bottom and when they show the border color on the first 8-pixels of the active display area. This option crops those colors out automatically, leaving only the SMS 256x192 active display area (256x224 for Codemasters' PAL games).

Original TMS9918A Palette – The Mark III and Sega Master Systems' VDP does not display the same colors as an SG-1000 or SG-3000, which use an original TMS-9918A VDP, would show when running SG-1000 games. Enable this option to give an authentic experience running SG-1000 games

on a Mark III or Japanese SMS. Disable the option to display them as they would on an SG-1000 or SG-3000. Similarly, F-16 Fighting Falcon's in-game graphics will be correct for an MSX (from which the game was ported) when the option is enabled and correct for an SMS when the option is disabled.

Enable CRAM Dots – This option allows you to show the CRAM graphical artifact similar to the Genesis core option, but SMS CRAM dots are typically scattered instead of being in a straight line, much more erratic and can be shown within the active display area.

Audio Settings

All Sega 8-bit home consoles, from the SG-1000 to the Master System II, come with an original or a built-in recreation of the 4 channel TI SN76489 PSG.

The Japanese Mark III supported an add-on FM Unit which included a Yamaha YM2413 9/6+5 channel 2-Operator FM Synthesis sound chip. The Japanese Sega Master System came with the YM2413 added to the console. The YM2413 upgrade was never officially released outside Japan. Many games support FM audio, even some games which were released only outside of Japan.

All audio on the original 8-bit systems was mixed and output in mono. The Channel Levels allow each channel of the PSG to have its volume adjusted independently and divides the YM2413 channels in half. The Channel Panning allows you to give stereo separation to the audio.

The Enable Cartridge Audio option allows you to use a genuine YM2413 chip as contained on the Power Base Mini FM or the Mega EverDrive or Mega SD's simulations of the YM2413 instead of Mega Sg's YM2413.

The default Channel Level is 60 for all sliders, the default Channel Panning is 0 for all sliders. and the default Cartridge Audio Volume slider is 90.

Controls

The Master System and SG-1000 used controllers with a D-pad and two fire buttons, mapped as follows to a Genesis/Mega Drive controller :

A or C = Button 1 (Left Button)

B = Button 2 (Right Button)

Start = Pause (found on the console on the original Master Systems)

Genesis/Mega Drive controllers will work properly with games like Alien Syndrome, Penguin Land and Wonderboy in Monster Land on Mega Sg. These games require the use of two button Master System controllers on original hardware or in Passthrough Mode.

If you wish to use Master System controllers, they are supported in Passthrough Mode but you cannot access the menu with them due to the lack of buttons.

A Genesis/Mega Drive controller plugged into controller port 2 can be used to access the menu and turn Passthrough Mode on so you can use 2-button controllers and other Master System/Mark III controllers like the Sports Pad and the Paddle Controller.

Any games requiring the keyboard from the SC-3000 or the SF-7000 disk drive will also not work.

The Light Phaser and the 3-D Glasses are not supported over HDMI due to incompatibility with LCD TVs. Analogue DAC will run these peripherals when connected to a CRT. Passthrough Mode must be enabled for the Light Phaser.

Master System Core Options

Use FM (YM2413)

Enables YM2413 FM audio for the 67 games which support it. A few games like Wanted and Walter Payton's Football may refuse to load if a YM2413 is present. Some games like Wonder Boy III: The Dragon's Trap and Time Soldiers must have their Hardware set to Japan to hear the FM sound. Ironically, neither game was actually released in Japan, so the FM audio for these games and many others were never heard during the Master System's original lifespan.

Modding your Master System Adapter

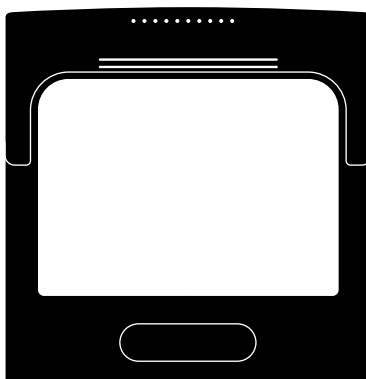
The Master System adapter included in your Mega Sg can be modified to add a pause button. This can be useful if using original Master System control pads.

There are four plated through holes to the lower left of the female cartridge connector. These holes will take a TL1105 switch. Soldering is required.

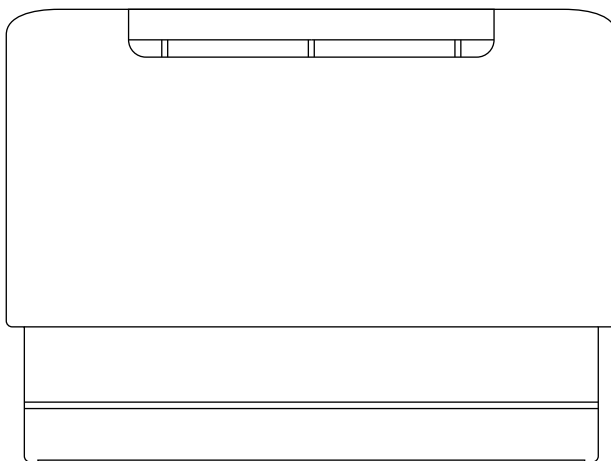
The actuator should be at least 13.00mm in length. You will need to open the enclosure of the Master System adapter with a T-10 bit. Finally, you will need to drill a hole and shave a little plastic inside the enclosure for the button to be accessible.

Playing Sega Game Gear Games

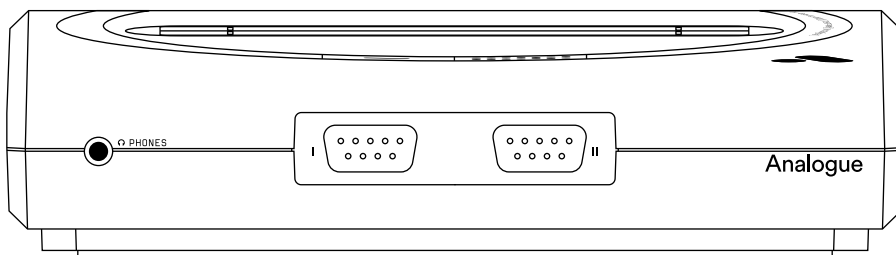
With the purchase of the Mega Sg Cartridge Adapter Set, you can use GG Adapter to play Sega Game Gear Cartridges.



Game Gear
Cartridge



GG Adapter



Mega Sg



Sega CD Spacer

Video

The Game Gear supports only one resolution, 160x144. Unlike the Game Boy, which shares the same resolution, the Game Gear's pixels are not square on its original screens. This is due to the passive color matrix of the LCD display used on the Game Gear, which consists of side-by-side vertical strips of red, green and blue filters over the liquid crystal layer to determine a pixel's color. Thus the pixels are wider than they are tall on an official Game Gear screen. The pixel aspect ratio of an original Game Gear screen is approximately 1.3:1. Using a 9x/7x scale, 1440x1008, will get you very close to proper pixel aspect ratio.

The Game Gear is compatible with Master System games but supports more colors, 4096, with its native games. Certain Game Gear cartridges run in Master System compatibility mode, which requires use of the Master System's 256x192 resolution and 64-color palette. When a Game Gear cartridge using Master System mode is being run in Mega Sg, it will run as a Master System game and use Master System options instead of Game Gear options.

Width & Height

1. 480p Options

Minimum/Maximum Width (Horizontal Pixels) :
320/640

Horizontal Presets (at 2.0x Vertical) :
320 (2x), 346 (4:3 for 16:10), 374 (Square Pixels), 480 (3x), 640 (4x)

Horizontal Presets (at 2.5x Vertical) :
320 (2x), 360 (1:1), 390 (4:3 for 16:9), 433 (4:3 for 16:10), 467 (Square Pixels), 480 (3x), 640 (4x)

Horizontal Presets (at 3.0x Vertical) :
320 (2x), 432 (1:1), 468 (4:3 for 16:9), 480 (3x), 520 (4:3 for 16:10), 561 (Square Pixels), 640 (4x)

Horizontal Presets (at 480) :
320 (2x), 480 (1:1), 520 (4:3 for 16:9), 577 (4:3 for 16:10), 624 (Square Pixels), 640 (4x)

Minimum/Maximum Height (Vertical Pixels) :
288/480

Vertical Presets : 288 (2.0x), 360 (2.5x), 432 (3.0x), 480

Horizontal Position : 0-128

Vertical Position : 0-64

2. 720p Options

Minimum/Maximum Width (Horizontal Pixels) :
480/1280

Horizontal Presets (at 3.0x Vertical) :
480 (3x), 561 (Square Pixels), 624 (4:3 for 16:9), 640 (4x), 693 (4:3 for 16:10), 800 (5x), 960 (6x), 1120 (7x), 1280 (8x)

Horizontal Presets (at 3.5x Vertical) :
480 (3x), 504 (1:1), 640 (4x), 655 (Square Pixels), 728 (4:3 for 16:9), 800 (5x), 808 (4:3 for 16:10), 960 (6x), 1120 (7x), 1280 (8x)

Horizontal Presets (at 4.0x Vertical) :
480 (3x), 576 (1:1), 640 (4x), 748 (Square Pixels), 800 (5x), 832 (4:3 for 16:9), 924 (4:3 for 16:10), 960 (6x), 1120 (7x), 1280 (8x)

Horizontal Presets (at 4.5x Vertical) :
480 (3x), 640 (4x), 648 (1:1), 800 (5x), 842 (Square Pixels), 936 (4:3 for 16:9), 960 (6x), 1040 (4:3 for 16:10), 1120 (7x), 1280 (8x)

Horizontal Presets (at 5.0x Vertical) :
480 (3x), 640 (4x), 720 (1:1), 800 (5x), 935 (Square Pixels), 960 (6x), 1040 (4:3 for 16:9), 1120 (7x), 1155 (4:3 for 16:10), 1280 (8x)

Minimum/Maximum Height (Vertical Pixels) :
432/720

Vertical Presets : 432 (3.0x), 504 (3.5x), 576 (4.0x), 648 (4.5x), 720 (5.0x)

Horizontal Position : 0-128

Vertical Position : 0-64

3. 1080p Options

Minimum/Maximum Width (Horizontal Pixels) :
800/1920

Horizontal Presets (at 5.0x Vertical) :
800 (5x), 935 (Square Pixels), 960 (6x), 1040 (4:3 for 16:9), 1120 (7x), 1155 (4:3 for 16:10), 1280 (8x), 1440 (9x), 1600 (10x), 1760 (11x), 1920 (12x)

Horizontal Presets (at 5.5x Vertical) :
800 (5x), 960 (6x), 1029 (Square Pixels), 1120 (7x), 1144 (4:3 for 16:9), 1271 (4:3 for 16:10), 1280 (8x), 1440 (9x), 1600 (10x), 1760 (11x), 1920 (12x)

Horizontal Presets (at 6.0x Vertical) :
800 (5x), 864 (1:1), 960 (6x), 1120 (7x), 1123 (Square Pixels), 1248 (4:3 for 16:9), 1386 (4:3 for 16:10), 1280 (8x), 1440 (9x), 1600 (10x), 1760 (11x), 1920 (12x)

Horizontal Presets (at 6.5x Vertical) :
800 (5x), 936 (1:1), 960 (6x), 1120 (7x), 1216 (Square Pixels), 1280 (8x), 1352 (4:3 for 16:9), 1440 (9x), 1502 (4:3 for 16:10), 1600 (10x), 1760 (11x), 1920 (12x)

Horizontal Presets (at 7.0x Vertical) :
800 (5x), 960 (6x), 1008 (1:1), 1120 (7x), 1280 (8x), 1310 (Square Pixels), 1440 (9x), 1456 (4:3 for 16:9), 1600 (10x), 1617 (4:3 for 16:10), 1760 (11x), 1920 (12x)

Horizontal Presets (at 7.5x Vertical) :
800 (5x), 960 (6x), 1080 (1:1), 1120 (7x), 1280 (8x), 1404 (Square Pixels), 1440 (9x), 1560 (4:3 for 16:9), 1600 (10x), 1733 (4:3 for 16:10), 1760 (11x), 1920 (12x)

Minimum/Maximum Height (Vertical Pixels) :
720/1080
Vertical Presets : 720 (5.0x), 792 (5.5x), 864 (6.0x), 936 (6.5x), 1008 (7.0x), 1080 (7.5x)
Horizontal Position : 0-128
Vertical Position : 0-64

Audio

The Game Gear relies solely on PSG for audio, but unlike its home console cousins, the Game Gear supports stereo output for its PSG. Each of the four channels can be assigned to output to the left channel, the right channel or both channels. The Game Gear controls volume by channel and the Mega Sg enhances this by allowing left and right outputs to have independent volume level

adjustments with the Channel Level option. The Game Gear also has no ability to do anything beyond hard left-center-right panning, so the Channel Panning allows for less extreme panning.

The Game Gear will allow stereo audio input to be passed through the cartridge port, but the only device known to use this functionality is the TV Tuner.

The default Channel Level is 60 for all sliders, the default Channel Panning is -84 for all L sliders and 84 for all R sliders and the default Cartridge Audio Volume slider is 90.

Controls

The Game Gear used a D-pad, two buttons and a start button. They are mapped as follows to a Genesis/Mega Drive pad :

A or C = Button 1

B = Button 2

Start = Start

The Passthrough Mode option has no effect with Game Gear games.

Video

Extra Features

Enable CRAM Dots – This option allows you to show the CRAM graphical artifact similar to the SMS Core option when CRAM dots are visible within the active video area. This is relatively rare with Game Gear games, Gunstar Heroes is one of the few games known to show the effect in a manner which can be perceived by players.

System

Hardware

Allows you to select between USA/Export and Japan/Domestic regions. Check Japan if you are having issues with getting a Japanese game to run, otherwise leave it at USA/Export and vice versa. There is no such thing as a PAL-speed Game Gear, PAL territories use the USA option.

GG Adapter Peripheral Compatibility

Analogue GG Adapter will work with the Game Gear TV Tuner with the following limitations :

The TV Tuner only receives analog TV broadcasts, so if your country has phased out analog TV broadcasting, this feature will be useless.

The Game Gear will not transmit sound through the adapter unless components are soldered on the Analogue GG Adapter's PCB. This modification is not supported and may void your warranty on GG Adapter and Mega Sg.

Analogue GG Adapter will work with Game Genie for the Game Gear, but the shell for the Game Genie does not fit with the shell for Analogue GG Adapter.

Note on Using Adapters

If your Mega Sg Boot Options are set to Title -> Menu or Title -> Cartridge, when the cartridge or card is booted, Mega Sg's video, audio and core settings will correspond to the system for which the cartridge or card is intended.

If your Mega Sg Boot Options are set to Menu Direct or Cartridge Direct, Mega Sg's video, audio and core settings will correspond to Genesis/Mega Drive. Reset the console for the correct settings to be applied.

This behavior also applies to the Master System Adapter included with your Mega Sg purchase.

Adapter Compatibility with Original Hardware

Analogue Adapters are compatible with original Sega Genesis or Mega Drive consoles with the following limitations :

Adapters will not work with SG-1000 MyCards or Cartridges or F-16 Fighting Falcon/F-16 Fighter. Analogue GG Adapter will not work at all. Adapters will not fit in a North American or European Sega Genesis or Mega Drive Model 1 or 2. Either the Adapter shell or the top half of the console shell must be removed for an Adapter to be used. They may fit in Japanese/Asian Mega Drives. Although they may fit in a Genesis 3, that console is not compatible with Mark III/Sega Master System software. Some Genesis 3 consoles can be modded to restore compatibility with Mark III/Sega Master System software.

You will be unable to pause the game using the Adapters on original hardware except for the Master System Adapter if you solder a pause button into it.



**To be this good takes
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