Instructions for the Ultra Deluxe Sega Game Gear

Upgraded, cleaned, and repaired by Segasonicfan Designs 12/2019
http://segasonicfan.wixsite.com/retro

Thank you for your purchase of this **Deluxe Sega upgrade**! Hopefully this mod will continue to show what Sega has claimed all along, namely that *Now, There Are No Limits.*

FEATURES AND REPAIRS

This unit has had **repairs**:

1. a complete replacement of all electrolytic capacitors (main and sound PCB)
2. thorough cleaning of leaking electrolyte on the PCB
3. sound PCB harness replacement
4. improved ceramic capacitor power bypassing

This unit has been upgraded with **four** (4) **brand new** PCBs:

1. Game Gear Power Board Pro *(by Segasonicfan Designs)*
2. Decoder Board Pro *(by Segasonicfan Designs* - first installed unit!)
3. Uni-Gen *(by Segasonicfan Designs)*
4. McWill LCD upgrade *(by McWill)*

Also **upgraded** with:

- Improved new speaker
- 2x 3.7V Lithium Polymer batteries (3000mah)
- Glass LCD screen protector
- new custom stickers on back

This **upgraded** unit has a bunch of **extra** features:

1. 3.5" color TFT LCD upgrade *(McWill mod)*
2. Multiple resolution modes for scaling and pseudo scanlines *(McWill mod)*
3. Sega Genesis / Mega Drive controller support with auto-fire and Start button capability *(SSFD Uni-Gen)*
4. 4Mhz Z80 CPU overclock *(SSFD Decoder Board Pro)*
5. PAL / NTSC region select *(SSFD Decoder Board Pro)*
6. PAL / NTSC color encoding switch *(SSFD Decoder Board Pro)*
7. VGA output *(McWill mod)*
8. 15khz low-res RGB output *(McWill mod)*
9. S-Video *(SSFD Decoder Board Pro)*
10. Composite video (CVBS) *(SSFD Decoder Board Pro)*
11. Switchable LCD backlight and decoder board power down modes *(SSFD Decoder Board Pro and McWill)*
12. Soft-reset button *(SSFD GG Power Board Pro)*
13. Single button power down (power cycling) *(SSFD GG Power Board Pro)*

14. 3-state battery LED display *(SSFD GG Power Board Pro)*

LED Indicator (bottom)

Orange: NTSC | Stock CPU clock (3.5Mhz)
Red: NTSC | 4Mhz CPU overclock
Green: PAL | Stock CPU clock (3.5Mhz)
Off (no color): PAL | 4Mhz CPU overclock

LED Indicator (front)

Blue: Battery is 70-100% full
Purple: Battery is ~ 60-70% full
Red: Battery is 30-60% full
Blinking Red: Battery is 0-30% full (charging is recommended as soon as you can)

LED Indicator (top)

Blue: Battery is 90-100% full (charge completed)
Red: Battery is 0-90% full (charging)
Please note, while the system is powered up, the charger cannot "trickle charge" the last 10%, so it will stay **Red** until power down.

HOW TO USE:

1. Power on / off:

Hold down blue **Power/Reset** button (on top right) for ~1second to power up and down (release button and wait ~1sec between power cycling)

2. Reset:

Tap the blue **Power/Reset** button for software reset (useful for flash carts and fixes the Kikzz bug)

3. Selecting the display option:

- Turn brightness knob (on the left of the console) to the full **UP** position to **enable** the internal LCD output and 15khz low-res RGB mode (via VGA jack).

- Turn brightness knob (on the left of the console) to **MIDDLE** position to disable the internal LCD output and only use S-Video / CVBS outputs.

- Turn brightness knob (on the left of the console) to the full **DOWN** position to disable the internal LCD output and only use VGA output (note: VGA also supports screen resolution modes).

4. Selecting different video resolutions and scanlines:

any time after power up press and hold **DOWN**, **2**, and **1** to cycle through each option (resolution and scanlines alternate).

5. Selecting CPU Clock:

- Hold down the **START** button for ~ 1 second to enable 4Mhz overclocking (LED will turn **Red**).
- Wait for one second and repeat to revert back to stock clock setting (3.5Mhz, LED will turn **Orange** or **Off**, depending on region setting).

6. Selecting Auto-Fire (external controller only):

While using a external Sega Genesis / Mega Drive controller:

- Pause the Game. Enable overclock if you desire (see above).
- Hold **LEFT** and (while holding) press **START** to unpause the game (autofire is now active).
- Press **START** again to deactivate autofire.

(Note 1: this mode is especially useful for Fantasy Zone Gear :)
(Note 2: you will need to hold down the MODE button on system power up if using a 6-button Genesis / Mega Drive controller).

7. Selecting Region:

- If using a flash cart, select your game from the menu and load it (skip this step for regular cartridges)
- Tap the blue **Power/Reset** button (on the top of the console).
- Hold **DOWN** and tap the blue **Power/Reset** button to activate PAL mode (LED will turn **Green** or **Off,** depending on the CPU clock setting.)
- Note: if using an NTSC television, the image will roll vertically and be in black and white - *this is perfectly normal*. If you don't have a PAL television, you can use the internal LCD or VGA output. If you want the perfect aspect ratio without the scaling, you can use a simple composite / S-video to VGA converter like here: https://www.ebay.com/itm/TV-Box-RCA-Composite-Video-Converter-AV-to-VGA-Adapter-For-PC-Monitor-Notebook/223497466679?

7. Charging:

The console can be charged with a regular USB mini A male connector. These are more durable than type B or C and can be bought for fairly cheap. A 2A (10W) power supply is ideal (so it will charge while you are playing), although most all USB chargers and portable batteries will work fine.

IMPORTANT NOTES (PLEASE READ):

1. Unfortunately, the composite video output is unavoidably a bit noisy. This is not due to the PCB construction but the inherent design of the Sega Game Gear. In order to make a portable system, Sega incorporated the digital sound circuitry into the video processor. This creates a fair amount of audio bleed into the video, which is exacerbated with composite due to its heavily modulated signal. This issue is exacerbated by the heavy power requirements of so many additional PCBs installed however, when comparing side-by-side to a different Game Gear with a Viletim GGTV, results were similar.

2. The new speaker installed is especially magnetic and can attract little bits into the wide openings of the Game Gear speaker grill. Be especially careful not to place the unit face down near small bits of metal.

3. It is recommended to wait a second or two when power cycling. Electronics don't like to be charged and discharged rapidly, as it wears out the life of the capacitors they use. Waiting an extra second between power cycles is a nice way to increase longevity.

4. Lithium-ion batteries do not like to be discharged all the way to zero. Contrary to common belief, it is best to charge them as often and regularly as possible, ideally between 70-90%

5. The unit has a very small power drain due to the internal circuitry. It is recommended that a full charge be provided every 6 months of non-use.

6. It is not uncommon for small bits of dust to get behind the screen cover. You can use a credit card with very thin small piece of plastic to lift up the dust cover used compressed air to blow dust if needed.

7. Use caution when moving the system around if it's plugged into the charger or video connectors. Special precautions should be taken with the VGA connector which can be held in with the screw terminals (turn left on your VGA connector mounts before pulling out the jack).

SAFETY:

DO NOT take off battery covers, disassemble, or otherwise remove or tamper with the batteries. These are permanently installed into the system and should not be messed with. Doing so could cause a fire risk, leak chemicals, or other bad things. *Leave the batteries alone* and they will be fine. (Note that each battery has its own protection PCB installed to prevent overcharging / undercharging and shorting. The GG Power Board Pro also has protections, including a resetable fuse installed.)

Do not open the battery compartments or tamper with the batteries or internal circuitry in any way. This unit is only to be serviced by Segasonicfan Designs.

Thank you for your purchase !! I hope you enjoy this wonderful Sega Game Gear for many years to come :))