

**64HD™** 

*EXPERT*  
**Installation &  
Assembly Guide**  
**For All Standard N64 Models**

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# 64HD<sup>TM</sup>

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# Legal Disclaimer

Gamebox<sup>LLC</sup> can, in no way, be held liable for any damage to the user's property, or the user's health from following these instructions. While these instructions aim to give the user a comprehensive and safe guide to completing this modification, there are many potential variables that could result in the unit that the user is attempting to modify requiring more restorative measures. There is also a serious risk of, injuries, and death when working with electronics. At the time of this guide's writing these consoles are rapidly aging, and even working units should be recapped as soon as possible. Chemicals associated with some of these processes are quite toxic and should be handled with care and adult supervision. Results may vary. "64HD", "Gamebox", "Gamebox Systems", "gamebox.systems", its associated internet domains, and the associated logos in this document are trademarks(™) of Gamebox<sup>LLC</sup>, A Limited Liability Company. This document, text and, images contained there-in are property of Gamebox<sup>LLC</sup> ©2023 Gamebox<sup>LLC</sup>, all rights reserved.

## Kit Contents:

- 64HD PCB
- HDMI daughter PCB
- RCP flex cable
- 15 pin FFC
- No cut AV shroud
- HDMI PCB mounting bracket
- 2x 5mm M2 screws

## Tools Required:

- Gamebit screw driver
- Phillips size 0 and 2
- Soldering iron (fine tip recommended for drag soldering)
- Solder (Lead solder is strongly advised)
- Flux (liquid or normal will work fine)
- Wire gauge 30 to 32 (no smaller or larger)

## Usage and Features

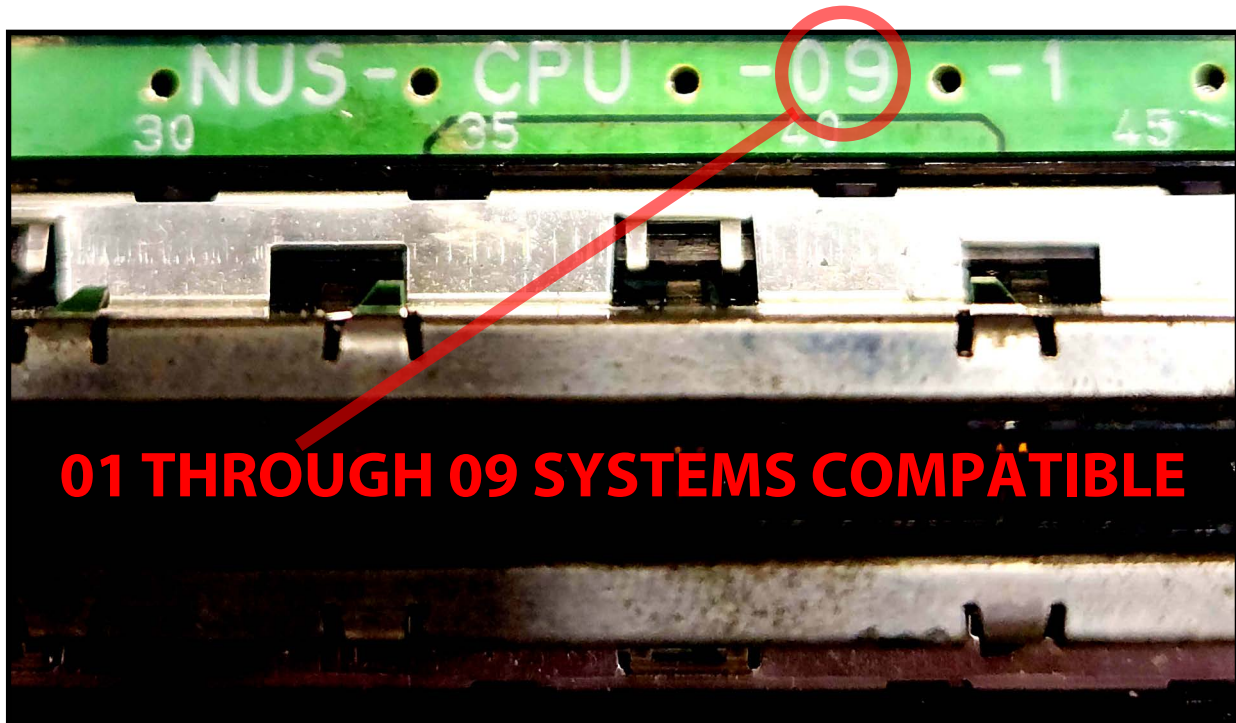
The 64HD modification kit aims to be a budget friendly solution to getting digital RGB video from a standard(systems based on motherboard revisions 01 to 09 from ANY region including special editions) N64 console outputting over HDMI. The 64HD is capable of providing a minimal non-variable lag experience at either 480p(progressive) or 720p. Non variable low-latency 240p and 1080i (interlaced) modes are also available, but may require additional equipment(an HDMI to Component pass-through converter for 240p). This implementation of 1080i is not compatible with some HDMI transceivers and it should be considered an experimental feature, as it's inclusion did not cost further resources. Some HDMI transcievers have been shown to drop audio, HDMI audio converters can be used as a workaround until the problem is identified. 64HD also comes with multiple picture and filter options. **Whose functions, are fully explained on page 14 of this document.**

*Hold down the following button combinations for atleast two seconds to access the quick features:*

- L + R + C-DOWN + DPAD-DOWN** -> enter OSD
- L + R + LEFT DPAD + C-LEFT** -> enter 240p mode
- L + R + UP DPAD + C-UP** -> cycle to next resolution

## Determine The Motherboard Revision

### STEP 1



64HD is compatible with NTSC, NTSC/J, and Pal systems so long as they are standard to the 01, 02, 03, 04, 05, 06, 07, 08, or 09 revisions (models of basic consumer consoles including special editions) of N64.

The revision number is silk-screened above the cartridge slot. The revision number will be a two digit number starting with 0 and ending in 1-9 near the end of the full model number. This example motherboard is marked as "NUS-CPU-09-1" indicating it is either an NTSC or NTSC/J system of revision 09 compatible with this modification. (Pal systems have a (P) after the CPU). Later in this guide different steps are needed depending on if it is a revision 01-05, or a revision 06-09.

## **RCP Flex Cable Installation**

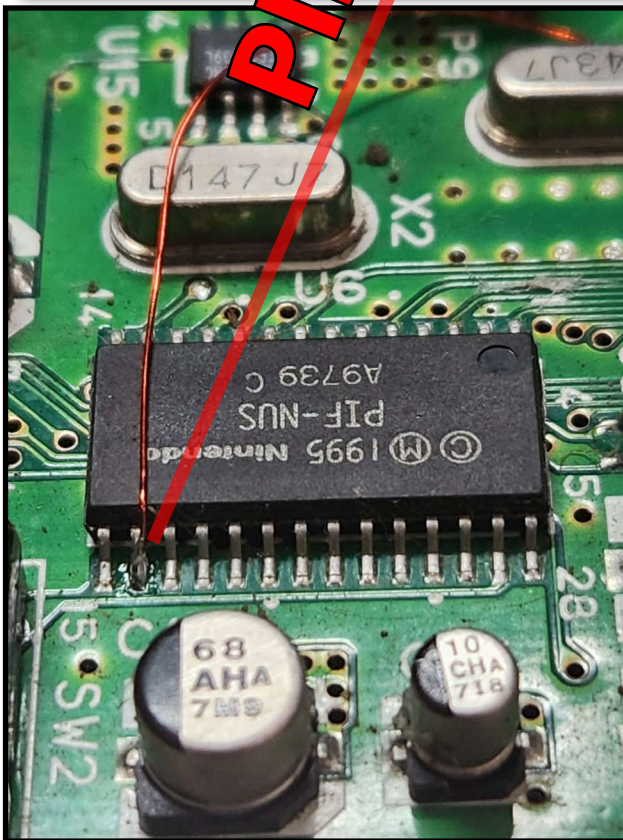
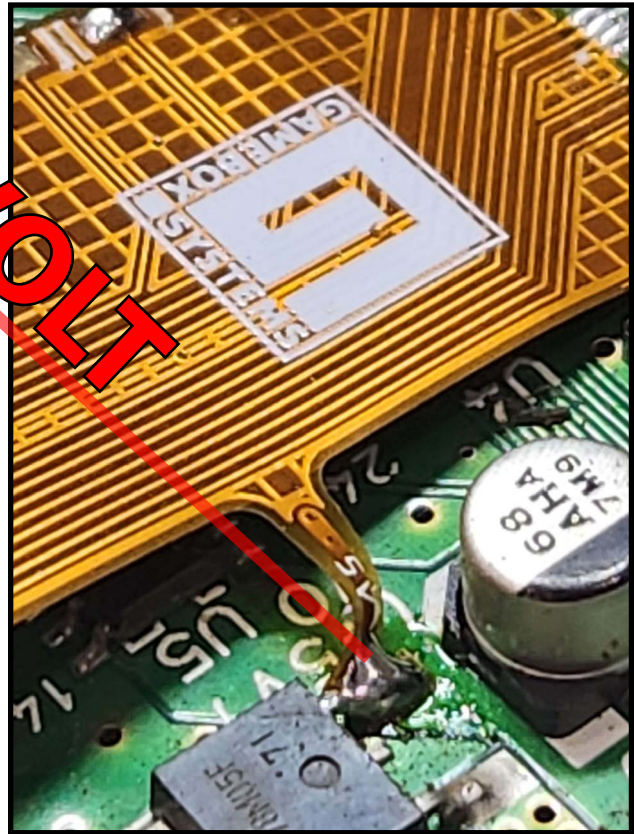
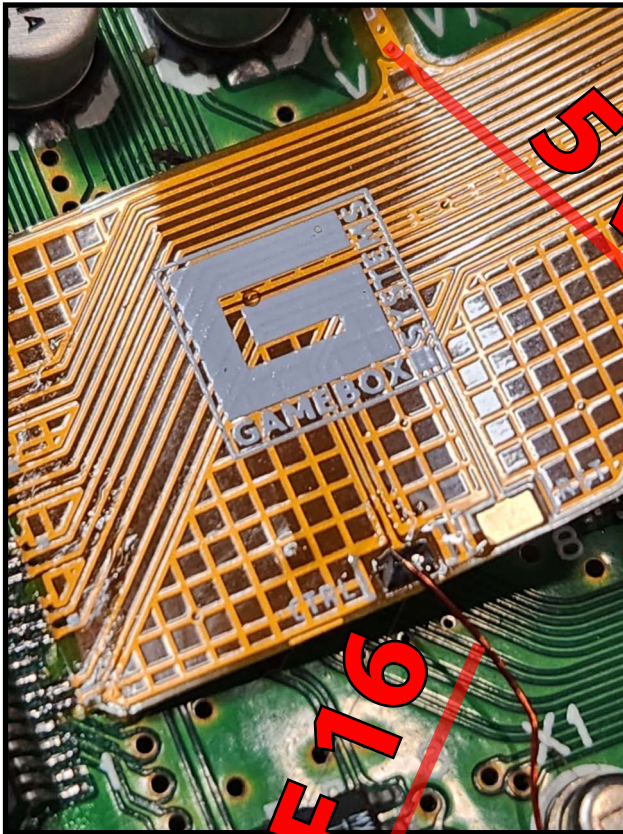
### **STEP 2**



Solder the RCP flex cable starting at Pin 6 (as shown above). Use leaded solder and lots of flux. This is very technical soldering, and mistakes can either ruin your cable, or damage the chip itself. If you damage your RCP flex cable another can be ordered from the retailer you purchased your kit from.

# RCP Flex Cable Additional Connections

## STEP 3



Solder the flex contact to the N64 motherboard location marked "5v" in silkscreen (shown above).

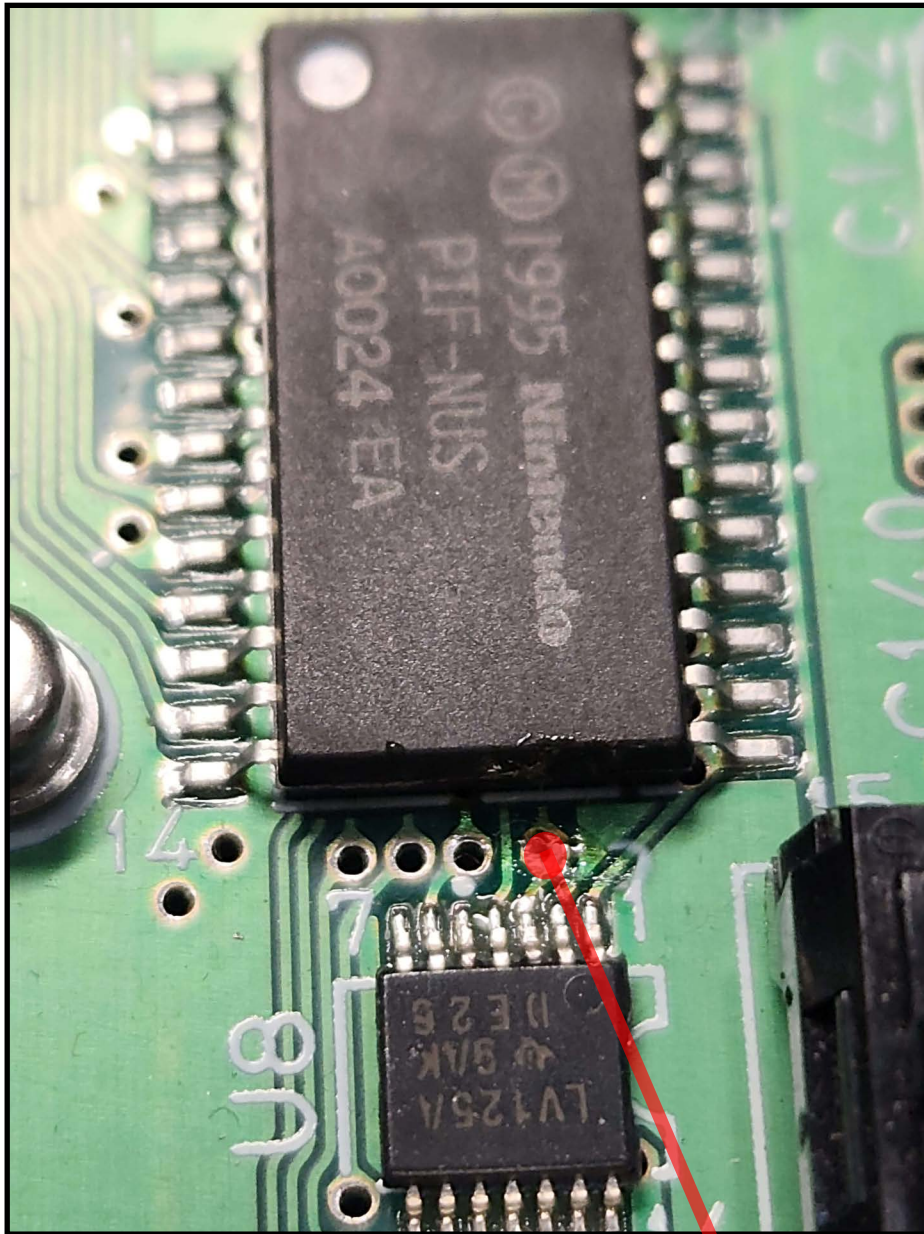
**FAILURE TO MAKE THIS CONNECTION PROPERLY WILL RESULT IN THE 64HD PCB FAILING TO BOOT WHEN THE CONSOLE POWERS ON.**

For N64 motherboard revisions 01-05 (shown left). Use a small amount of 30 gauge wire to connect the CTRL breakout pad on the RCP flex cable to PIN 16 on the PIF. The Reset pad isn't populated.

*For motherboard revisions 06-09 please see the next page.*

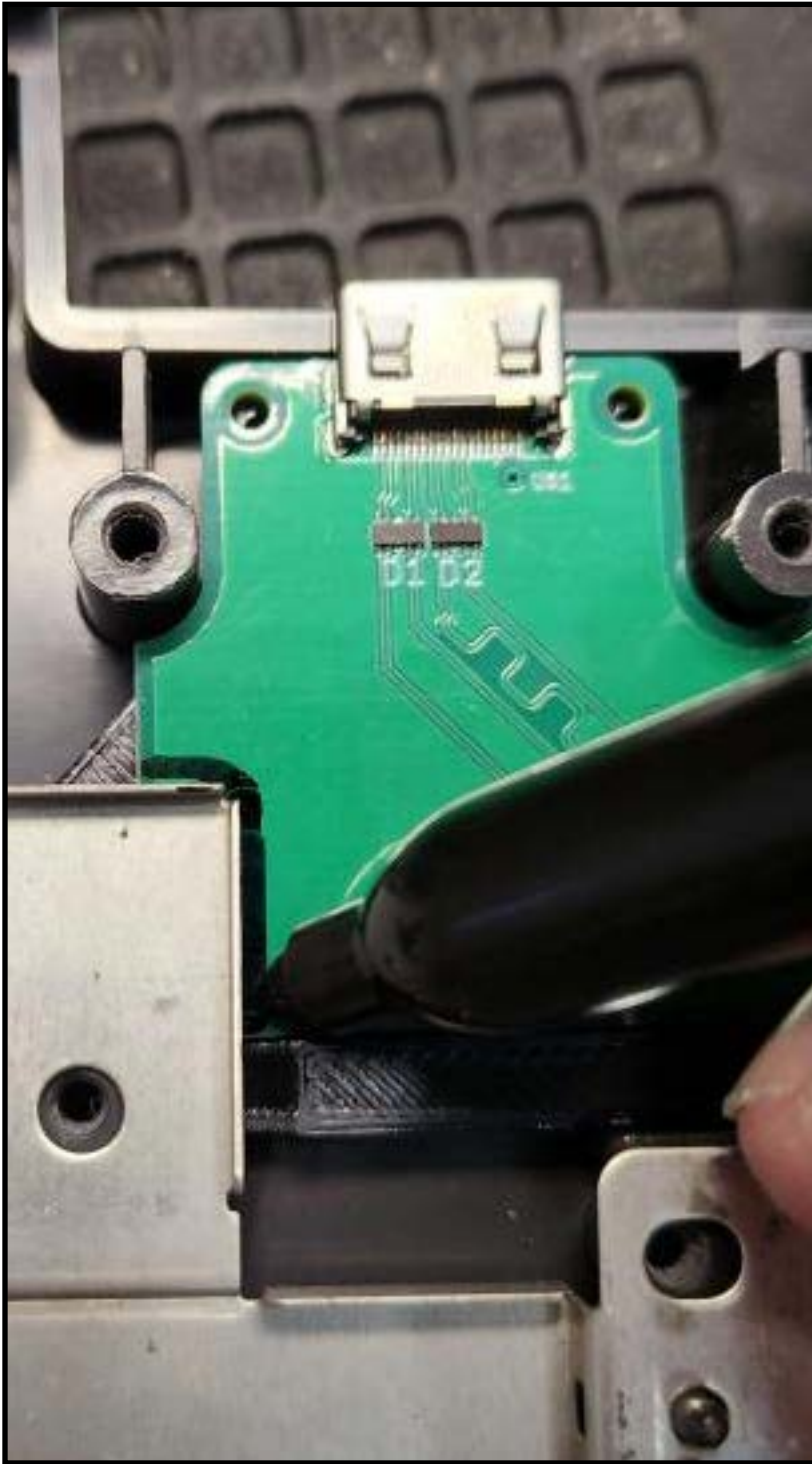
## Alternate PIF Location On Later Revisions

### STEP 4



For motherboard revisions 06-09 you must wire the CTRL pad to a VIA located next to the PIF chip instead of directly to the chip itself also using 30 gauge wire. **IF WIRED DIRECTLY TO PIF 16 THE USER WILL BE LOCKED OUT OF THE OSD.** Use a gentle abrasive or razor to remove the solder mask on the VIA before tinning and making the connection. The VIA is the 4th VIA point that is closer to PIN 15 of the PIF chip.

## **Trimming The Daughter PCB STEP 5**

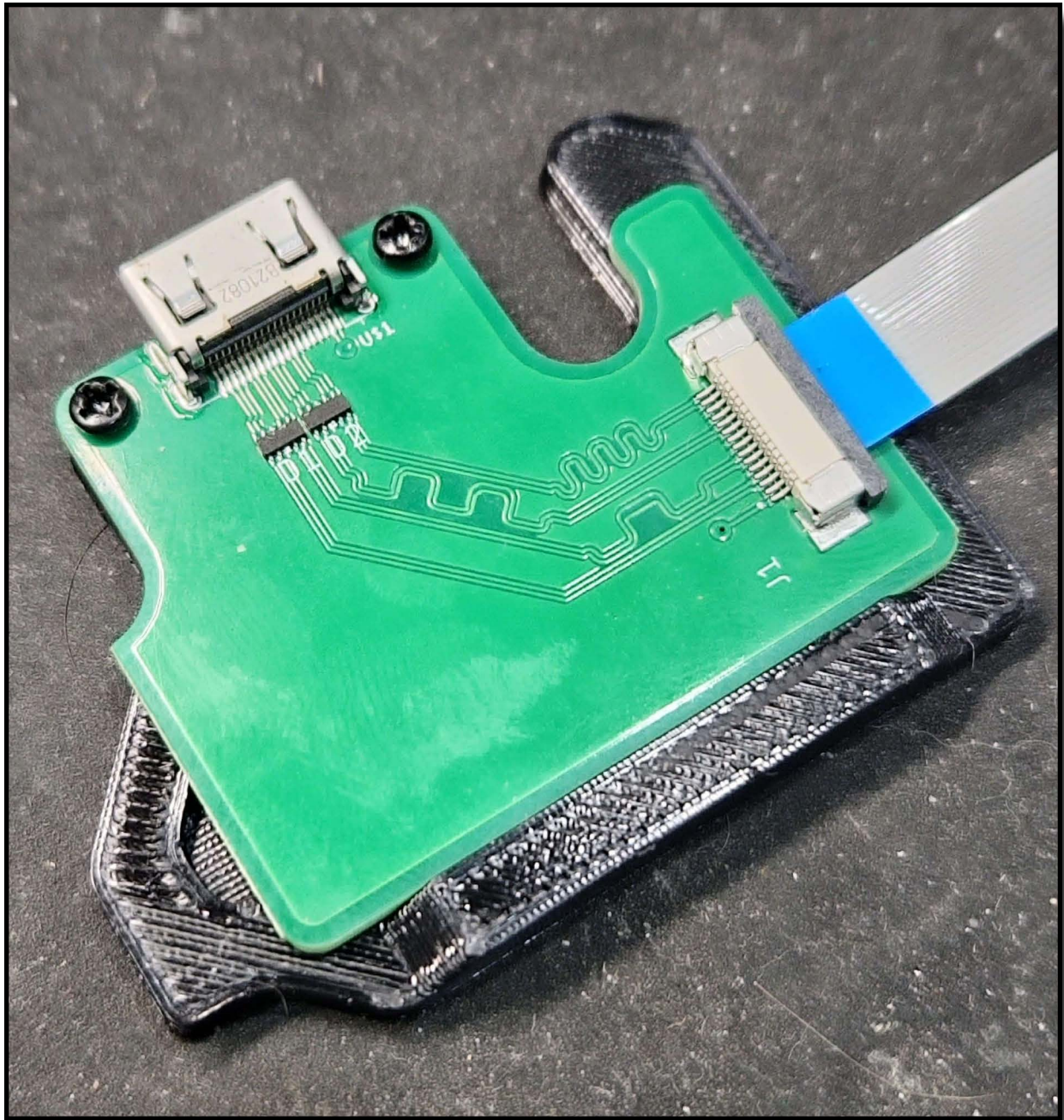


The fabricator who supplied the initial run of 3D printed brackets printed them with a larger nozzle than the model was designed for and pushed its tolerances enough out of line that it may be required to trim the pcb(as shown above). This issue will be fully resolved with further production runs. Simply trace the bottom rf shielding and trim at the line. A dremel or edge cutters will work.



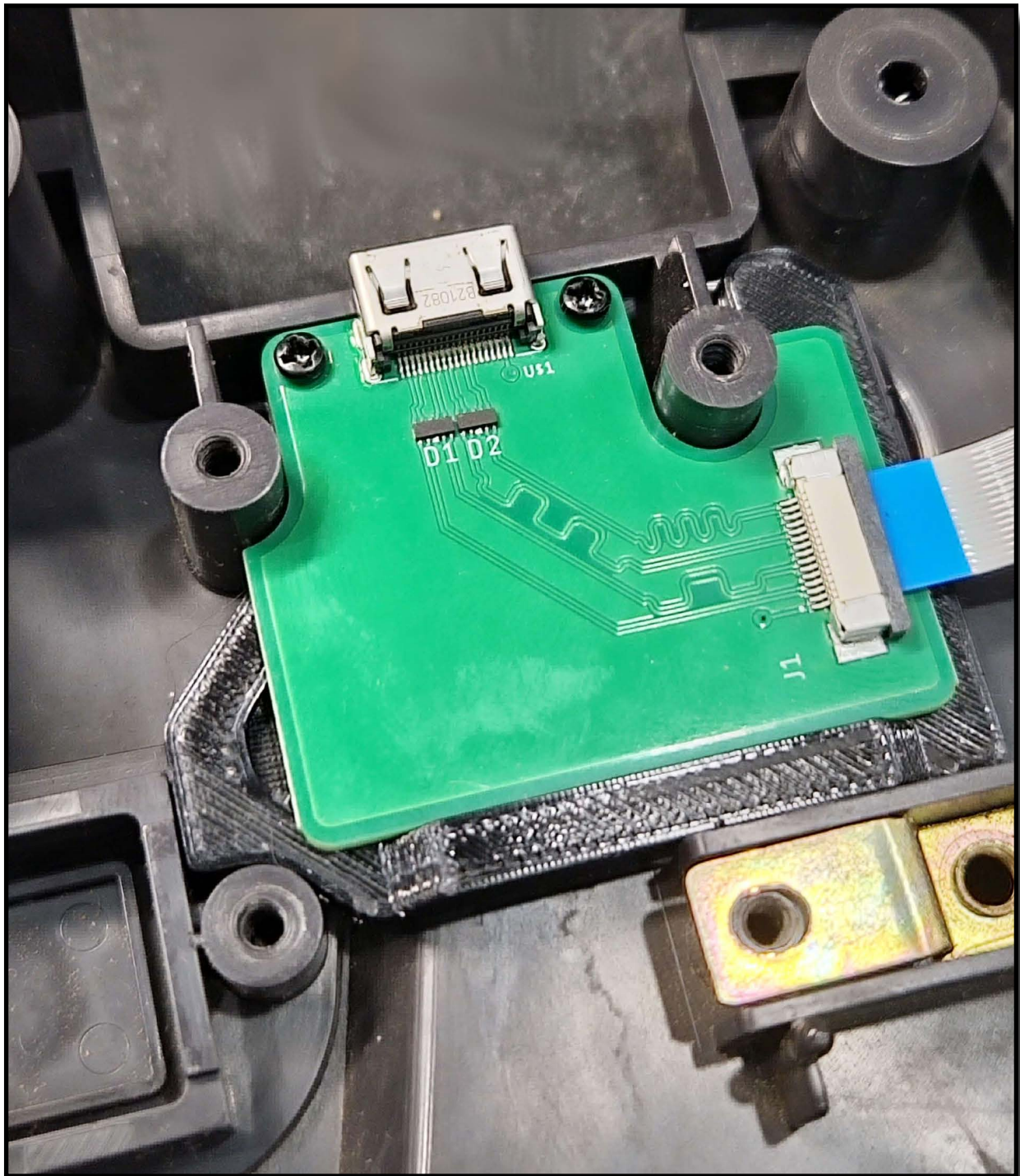
## **HDMI Daughter PCB Installation**

### **STEP 6**



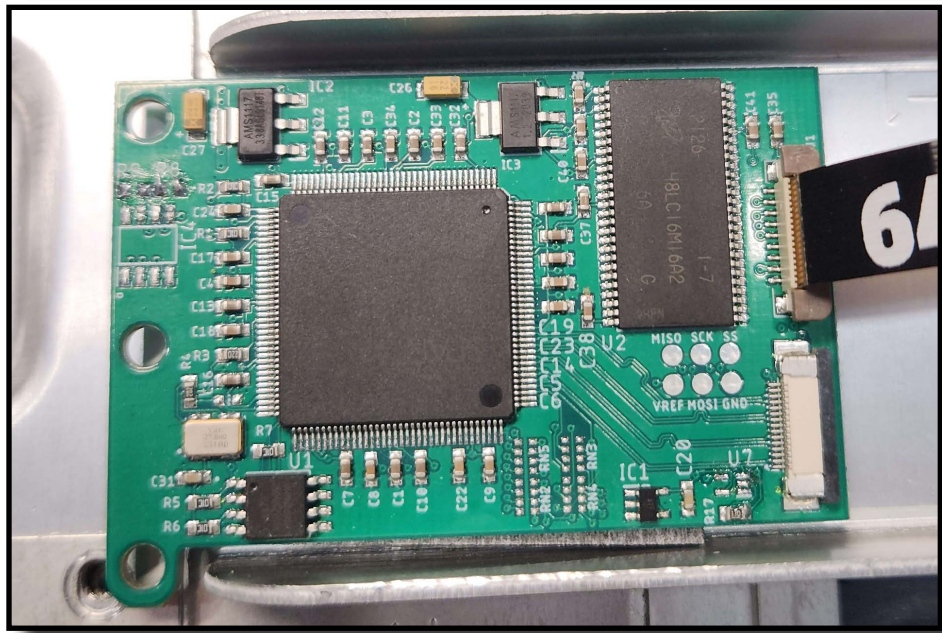
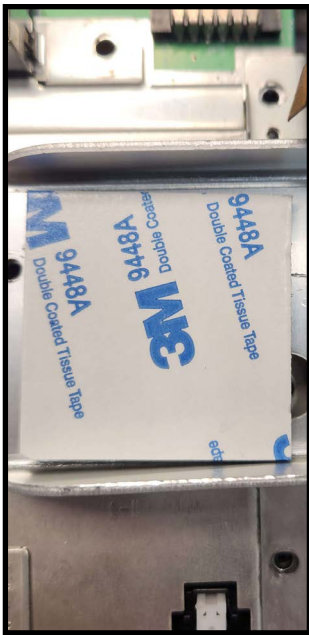
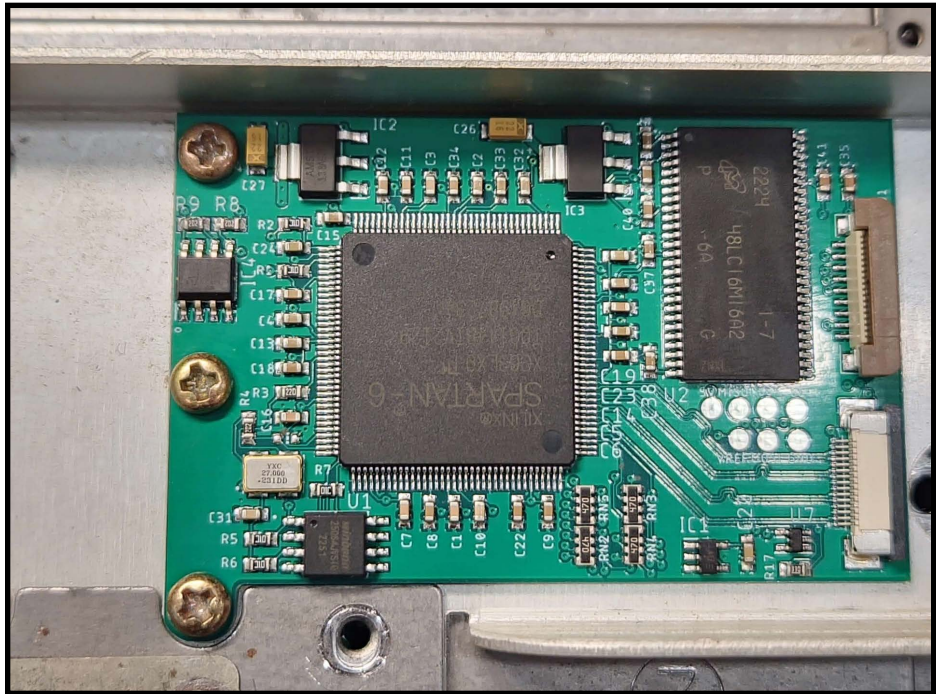
Mount the HDMI daughter PCB to included bracket using the included M2 screws. Install the daughter PCB's 15 pin FFC.

## HDMI Daughter PCB Installation STEP 7



Place bracket in the bottom N64 shell(as shown above). If it appears to be misaligned, the daughter PCB needs to be trimmed slightly. Place bottom motherboard shielding over the bracket.

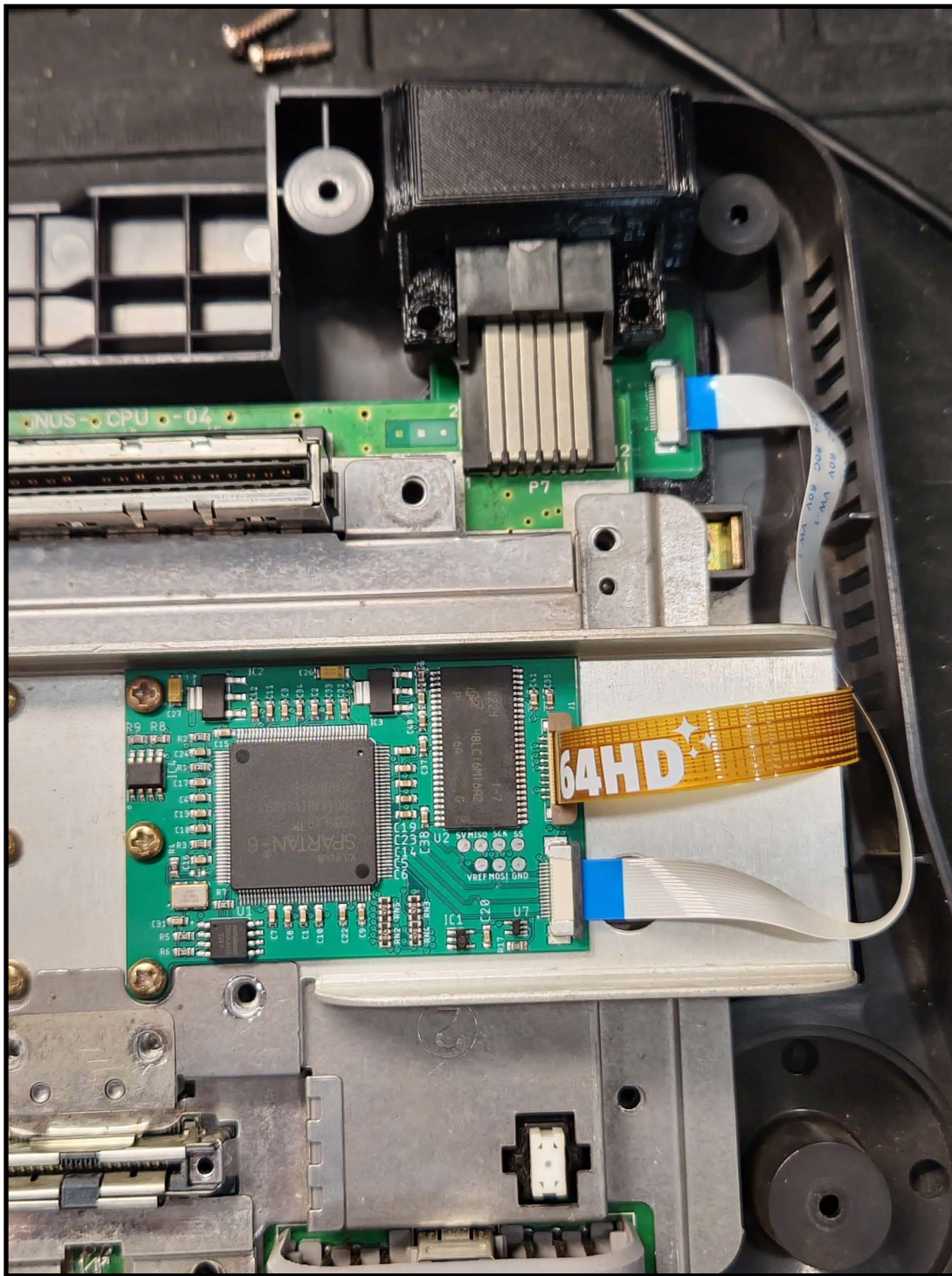
## 64HD PCB Installation STEP 8



Replace the N64 motherboard. Install the no-cut A/V shroud. Install the top motherboard shield. Remove the screws shown, line up the 64HD main PCB, and reattach the screws.

**NOTE:** If your motherboard is a later model that does not include these screw holes, use the included double sided foam tape to secure the 64HD PCB down to the N64 heatsink.

## Flex Cable Attachments STEP 9



Insert flex cables into the corresponding sockets as shown (above).

# Final Assembly, Testing

## STEP 10



Double check to make sure all flex cables are properly attached. Test the system before putting the top shell back in place. Hold down the following button combinations for atleast two seconds to access the quick features:

- L + R + C-DOWN + DPAD-DOWN** -> enter OSD
- L + R + LEFT DPAD + C-LEFT** -> enter 240p mode
- L + R + UP DPAD + C-UP** -> cycle to next resolution

## OSD SETTINGS

- Display Settings
  - Res
    - ~ toggle for 240p, 480p, 720p, or 1080i resolutions
  - Scaling
    - ~ Prop(integer), Str(16:9 non integer full-screen), and TV(1.5X non integer linear scale)
  - Overscan
    - ~ Toggle the Overscan border. (Useful on older displays and displays with large bevels)
  - Alt Audio Sampling
    - ~ Defaulted On 32kHz audio sampling, when Off it reverts to 48kHz audio sampling. Toggling this feature may solve audio compatibility problems. It will cycle resolutions during the toggle.
- Picture Config
  - Filter
    - ~ Enh(Enhanced) a diminished sharp filter with contrast applied
    - ~ Smth(Smooth) a weighted average to soften edges
    - ~ Shrp(Sharp) an oppositely weighted average to define edges
  - Filter Brightness
    - ~ Increase or decrease the brightness of the filter
  - VI Deblur
    - ~ Used for low resolution non 480i games to deblur image in final step of N64 image processing
  - Scanlines
    - ~ Toggle simulated scan-lines
- Save Settings
  - ~ Save your current settings
- Info
  - ~ Revision information and credits

## FAQ

### Q: Why am I having issues with specific video modes or don't have sound?

A: The video/audio stream from 64HD is sent directly from the FPGA and each receiving TV/Monitor has a different way of interpreting the incoming data stream. Most screens are perfectly compatible with 720p, however, some screens may have graphical and/or audio issues in 1080i or 480p mode. We have worked to minimize these incompatibilities but compatibility is not guaranteed due to the nature of the video/audio stream.

For audio specific issues, toggle the "Alt Audio Sampling" feature in the "Display" menu. This may restore audio depending on the screen.

For video/audio/graphical issues or glitches, try another screen to see if the issues are still present. If they are, try another HDMI cable (high quality gold plated cables have the best success rate). If they are not still present, the screen used may have an incompatibility. Try using a new HDMI cable as previously stated or different resolution/alt audio sampling mixtures to see if there is a mode that will work with your particular problem screen.

### Q: I am only seeing a rainbow bar screen. What does that mean?

A: It indicates that your 64HD PCB is receiving power and outputting HDMI signal but it is not receiving a signal from the N64 itself. Check your soldering joints and connections and try again.

## ***FAQ continued...***

**Q: I am pressing the OSD button combo but the OSD isn't popping up?**

A: Sometimes the button combo needs to be pressed and held more than once as the n64 has the ability to stop the polling of buttons at certain points in games or the button combo wasn't recognized for some reason or another. If you have pressed and held the OSD button combo multiple times with no result, check your wire is soldered in the correct location and try again.

**Q: There is a snowy like artifacting in the picture after install?**

A: Cold/bad solder joint on one of the data connections on the N64. Flux, resolder, and try again.

**Q: What is "reset" used for on the RCP flex cable?**

A: Nothing, it was used for development only.

