

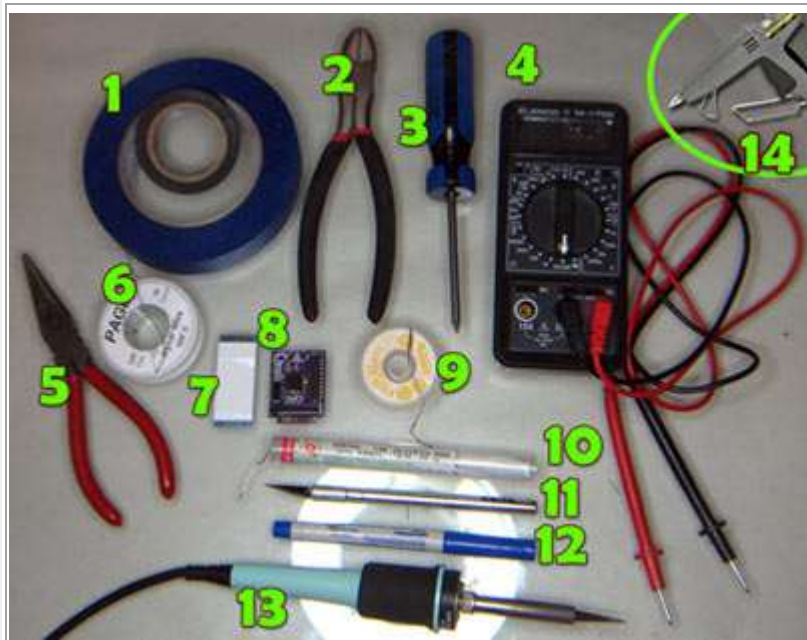
Model 1 Sega Saturn Mod Chip Installation Guide from Sega Style

<http://www.segastyle.com/model1Alt.html>

This is the new and more detailed guide for the Model 1 install. If you wish to reference the old guide please see: [Old Model 1 Guide](#)

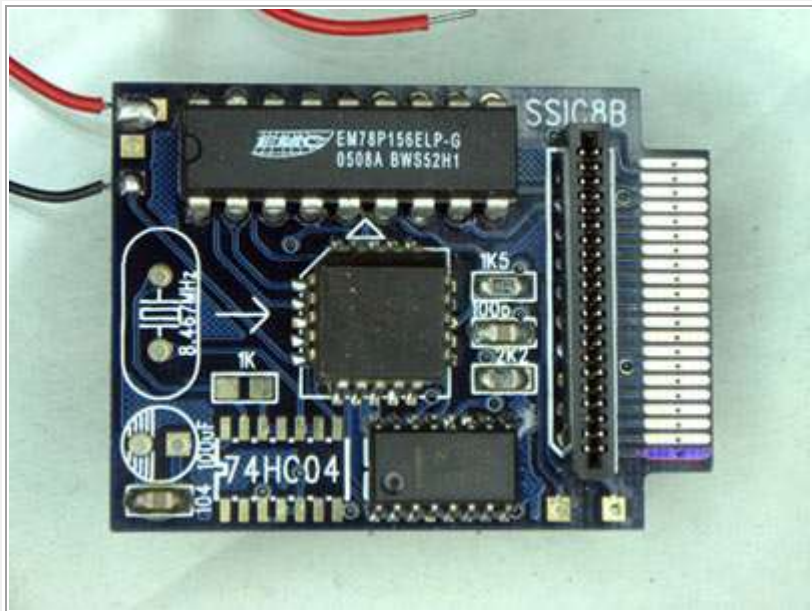
READ THROUGH ENTIRE TUTORIAL BEFORE ATTEMPTING THIS MOD!!!

An original guide previously found on the net did not consider the size of the Mod Chip and that it would not fit inside an assembled model 1 Saturn. In this guide you will find complete instructions on how to rewire a modern Mod Chip to be compatible with the original Saturn. Plus additional instructions on how to construct the mod so the chip will be positioned to fit inside without receiving damage. This will require fine solder work and tools - Advanced solder experience required! Most common knowledge instructions are left out (like how to use a Multi-Meter). This project may be considered to be too difficult for a beginner.



Necessary Tools

1. Tape (electrical or masking)
2. Wire Cutters (smaller are better)
3. Phillips Head Screw Driver
4. Multi-Tester (you will be using continuity mode)
5. Needle Nose Pliers
6. 30 Gauge Wire (larger could be used, but I recommend small)
7. 20pin ribbon cable
8. Saturn Mod Chip
9. Braided Solder Wick
10. Thin Solder
11. Hobby Knife/Razor
12. Marker
13. Fine Tip Solder Iron
14. Hot Glue Gun



Use marker to color out Pin 21.
You will not need this pin for the Model 1 Saturn installation.

The following instructions are detailed to help you get this done right, the first time. Not only does the Model 1 use 1 less conductor between the CD board and the motherboard, but some of the signals travel on different pins. This means it is necessary to re-route some of the connections on the Mod Chip so that the correct data gets manipulated by the Chip. The following images and instructions best demonstrate how to do this.

- THIS MOD CHIP IS FRAGILE - brace the chip, do not bend when cutting the traces with your razor blade.
- When making the cuts, do not press the blade through the chip only scrape the surface enough to pull-up/chop the thin copper tracing in half.
- The chip's cold solder may be slightly tarnished, make sure you have a connection with your Multi-Meter by testing the leads in the illustration before and after a cut.
- It is important to test the continuity of each cut and wire jumper - if the indicated traces are not properly severed, the modification will not work.

If the wire jumpers are not connecting the instructed jump points, this mod will not work; so always test and retest!

- It will be complicated to troubleshoot at end of installation if all directions/precautions are not followed. Read all available text along with the illustrated photos.

Key

Green Dot: Use multi-meter's leads at these points to test continuity - Test before cut and after to verify the trace was properly severed.

Red Line: Trace cut location

Purple Line: Previous Step's Trace Cut location(s) - Previous Step's added wire jumper.

Green Line: Wire jumper path with connecting points illustrated by green dots - Test after jumper is soldered to ensure connection.

Click photos for large version

Continuity Test:

Cut = Before: beep, **After Cut:** nothing

Wire Jumper = Before: nothing, **After Jump:** Beep

Used Terms:

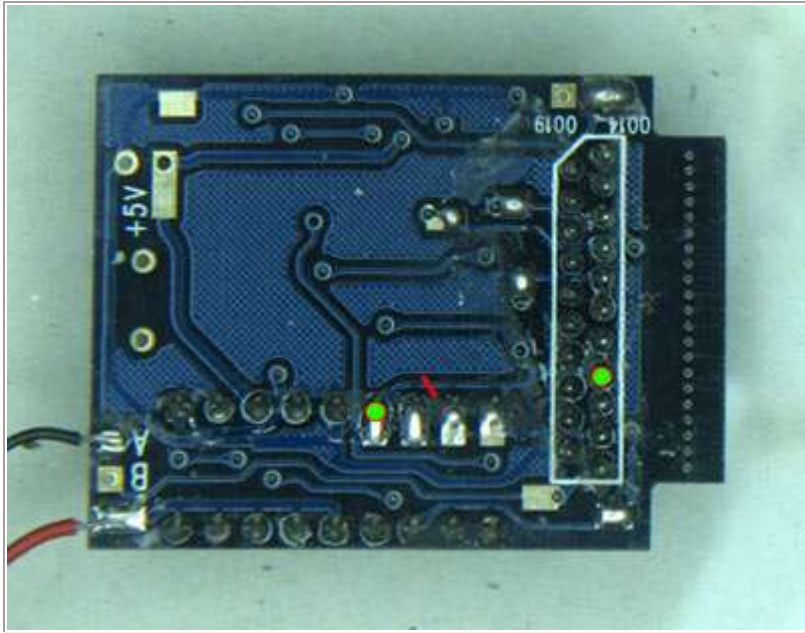
Edge = Conductor side of Mod Chip designed to plug into the saturn

Connector = Mod Chip's laser ribbon cable insert

EM78 = Large long Integrated Circuit on Mod Chip surface

Cap = Surface mount capacitor on Mod Chip surface

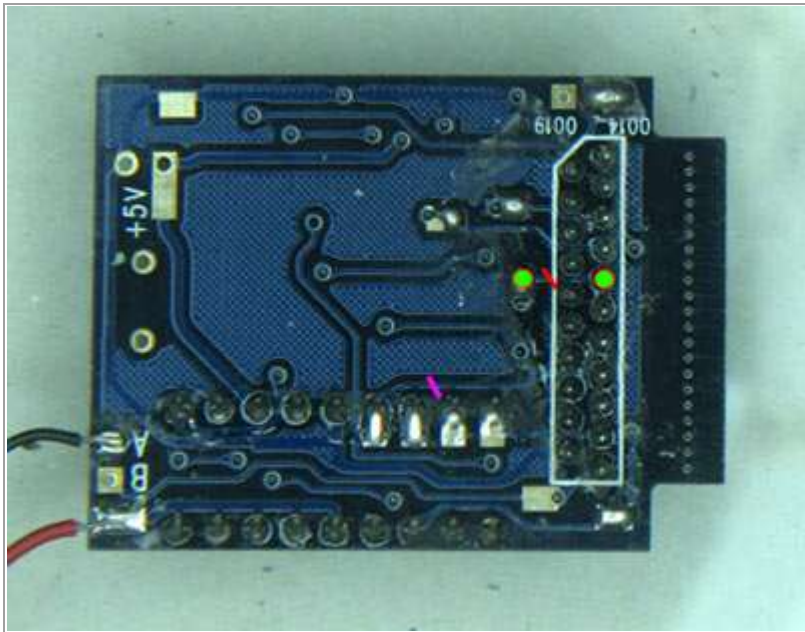
157 = Smaller rectangle shape Integrated Circuit on Mod Chips surface



Multi-Meter test locations illustrated in photo.

Cut Connector pin 7 -> pin 6 on EM78

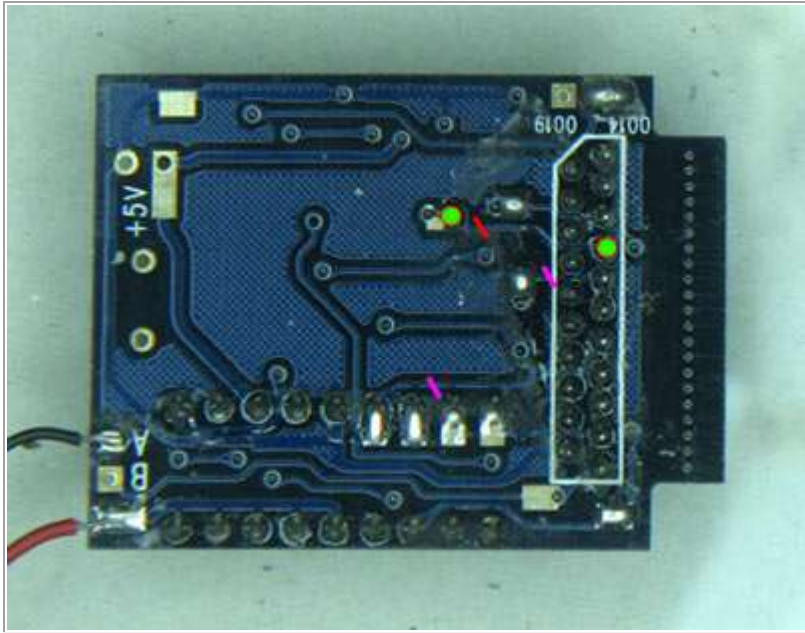
Test illustrated locations to make sure trace was severed.



Multi-Meter test locations illustrated in photo.

Cut Connector pin 13 -> Cap

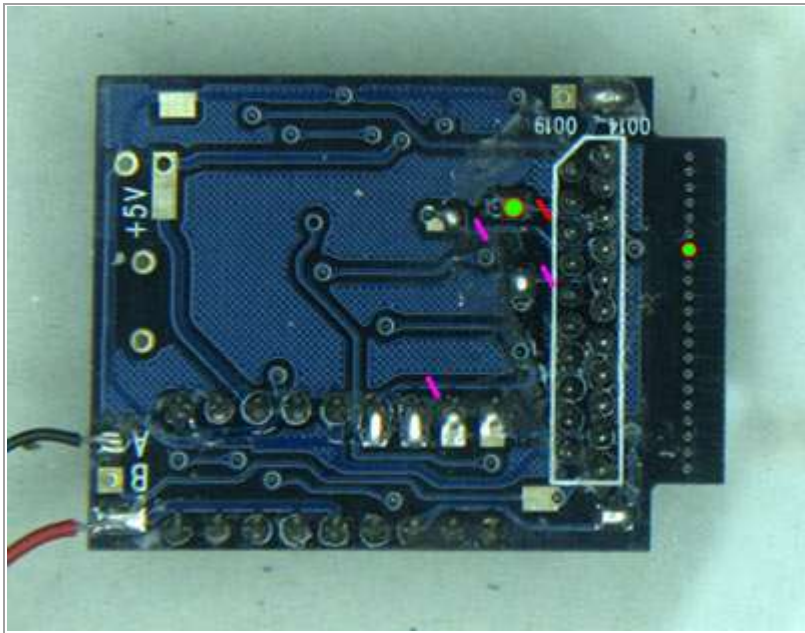
Test illustrated locations to make sure trace was severed.



Multi-Meter test locations illustrated in photo.

Cut Edge pin 15 -> pin 12 157

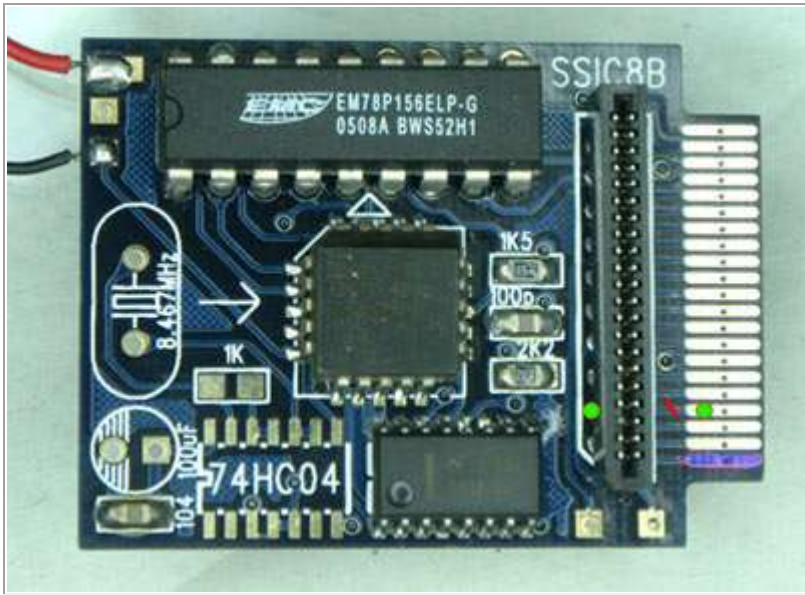
Test illustrated locations to make sure trace was severed.



Multi-Meter test locations illustrated in photo.

Cut Connector pin 15 -> pin 14 157

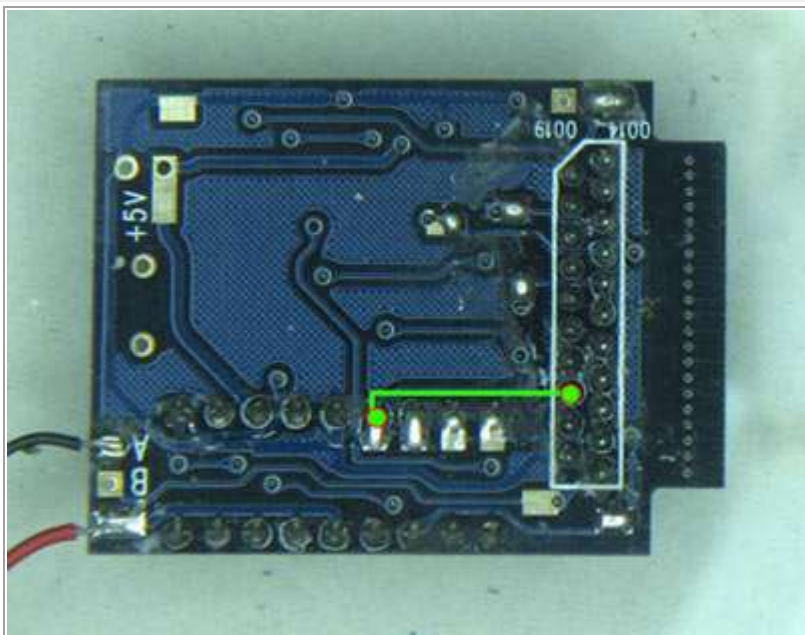
Test illustrated locations to make sure trace was severed.



Multi-Meter test locations illustrated in photo.
One location you will have to use a little pressure to reach the probe under the connector. Not too much pressure though.

Cut Edge pin 18 -> Connector pin 18

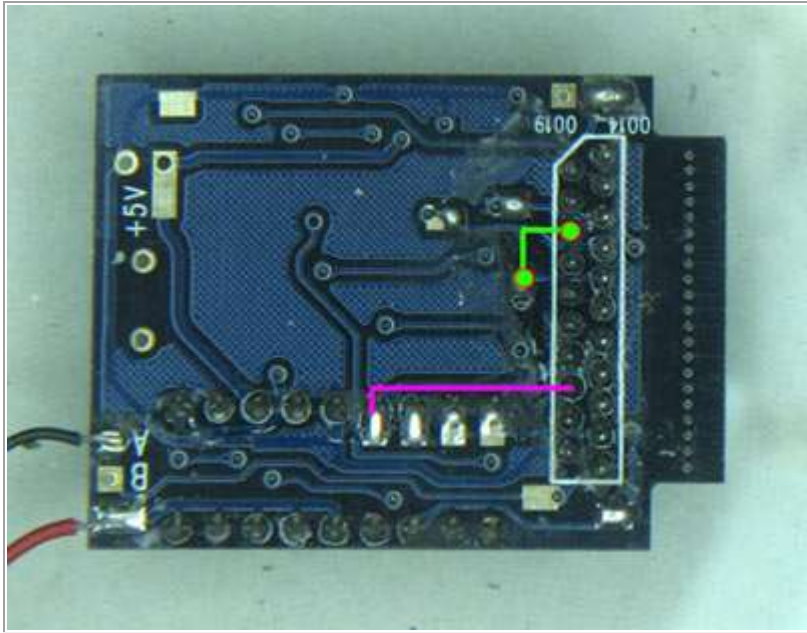
Test illustrated locations to make sure trace was severed.



Pre-measure, cut and expose ends of 30guage wire to be soldered to the points illustrated in the photos.

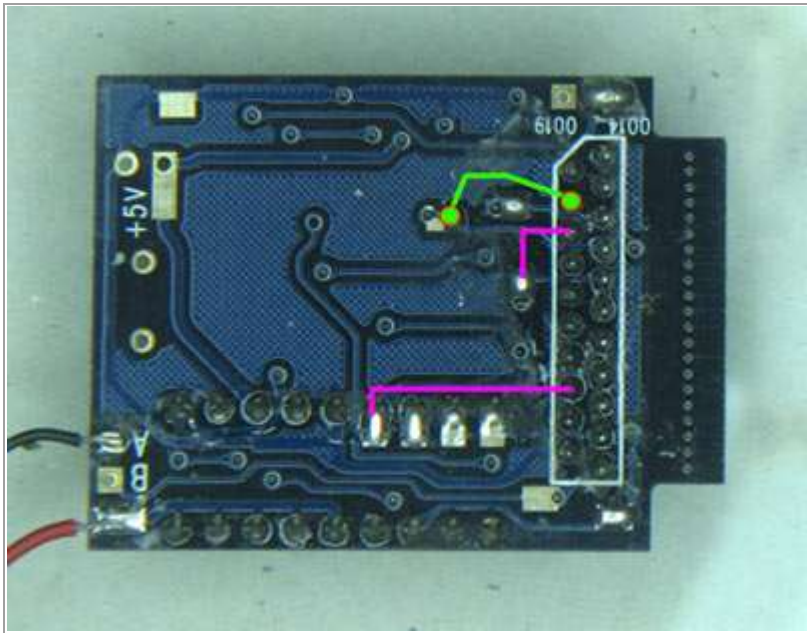
Connect Pin 6 EM78->Connector pin 6

*Use Multi-Meter to test newly soldered jump to verify continuity.



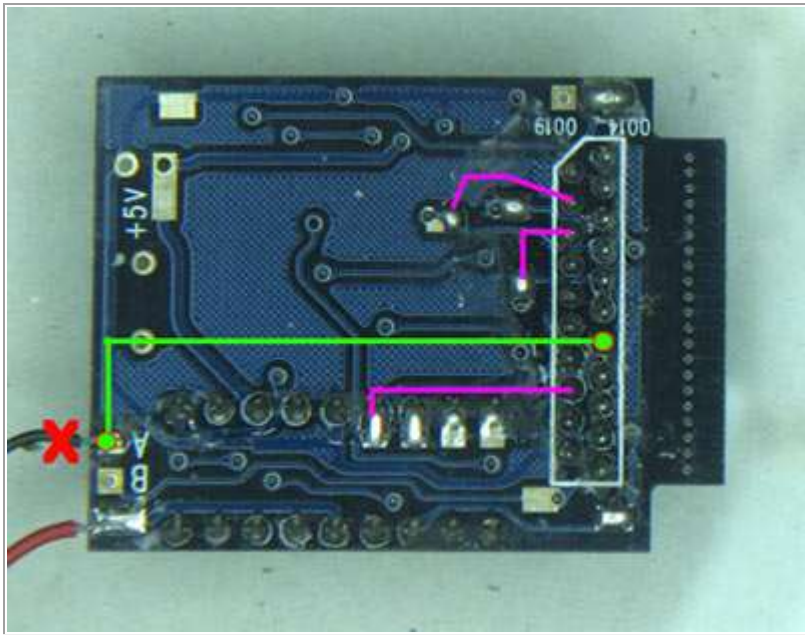
Connect Cap-> Connector pin 16

*Use Multi-Meter to test newly soldered jump to verify continuity.



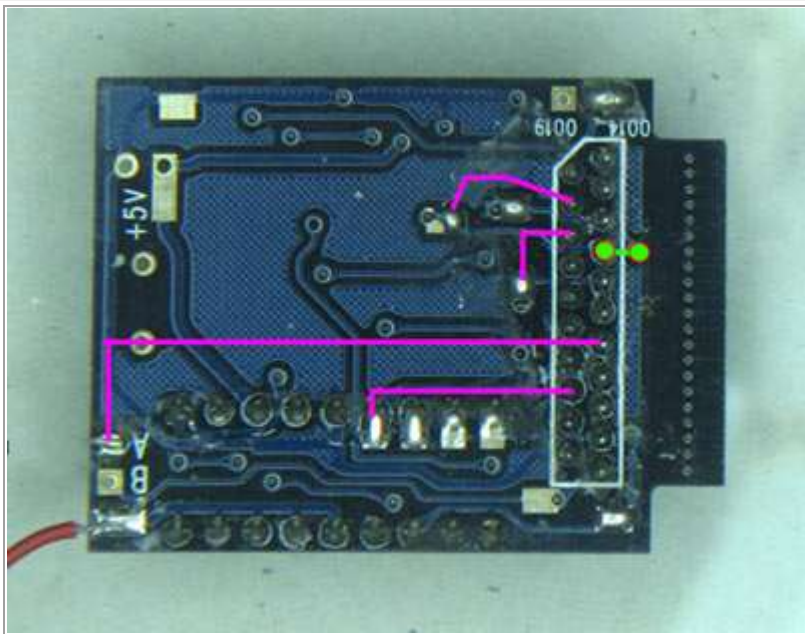
Connect pin 14 157 -> Connector pin 18

*Use Multi-Meter to test newly soldered jump to verify continuity.



Heat pad A's Solder and remove black lead.
Connect pad A [8MHz]-> Connector Pin 9

*Use Multi-Meter to test newly soldered jump to verify continuity.

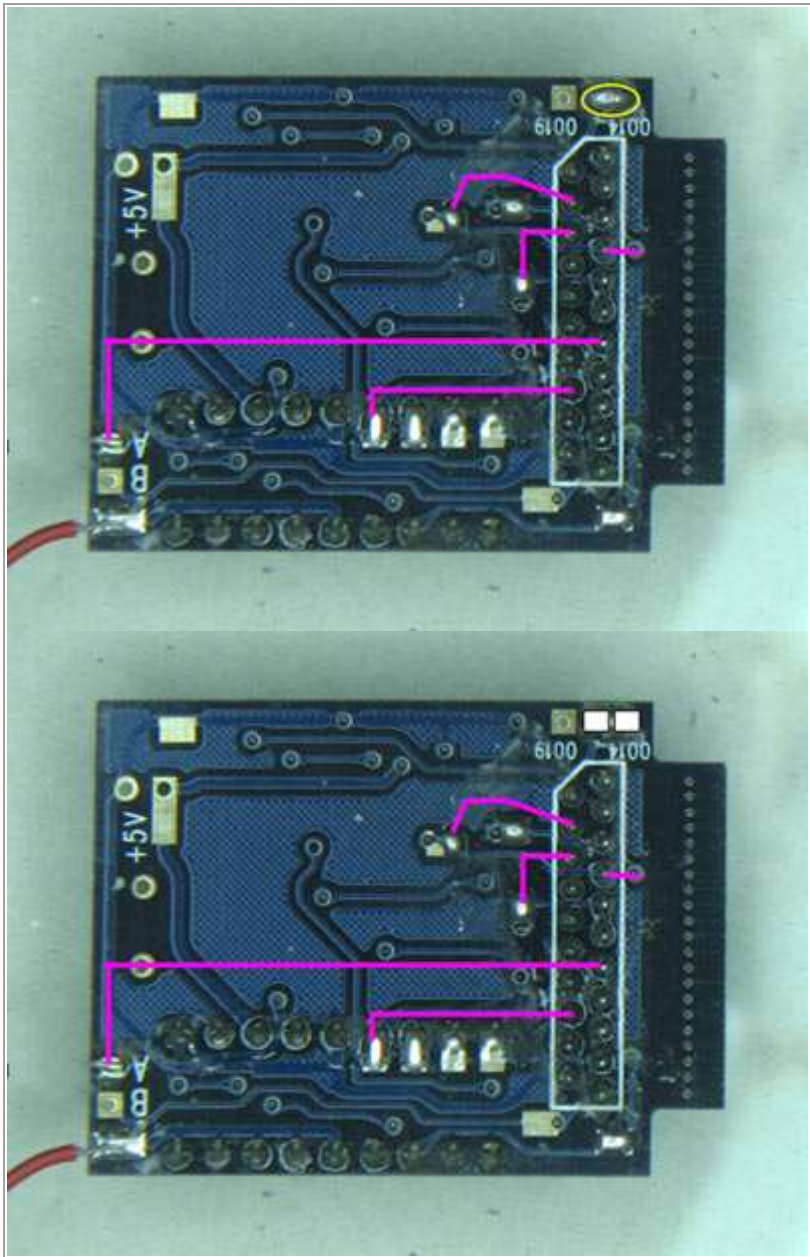


Connect Edge pin 15 -> Connector pin 15

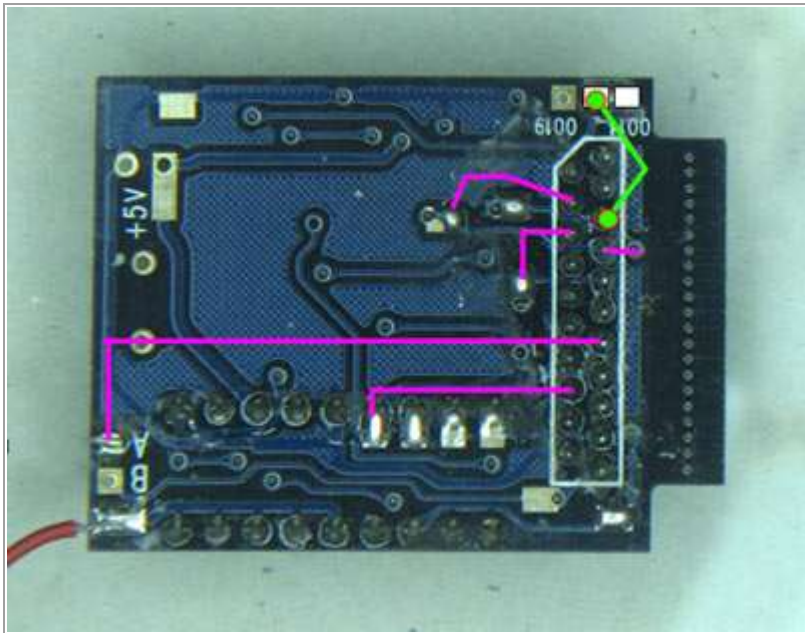
There is a small hole in the Mod Chip at this location; strip 30 gauge wire end, place it through that hole and solder to the Edge pin 15.

Use front finished image below as solder example.

*Use Multi-Meter to test newly soldered jump to verify continuity.

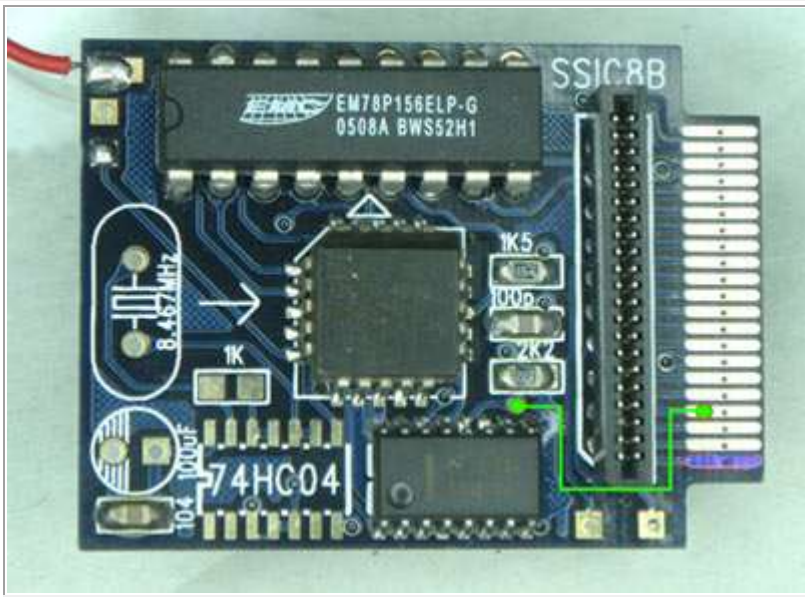


Remove solder using Solder Wick from pads 0019,0014



Connect middle pad ->Connector pin 17

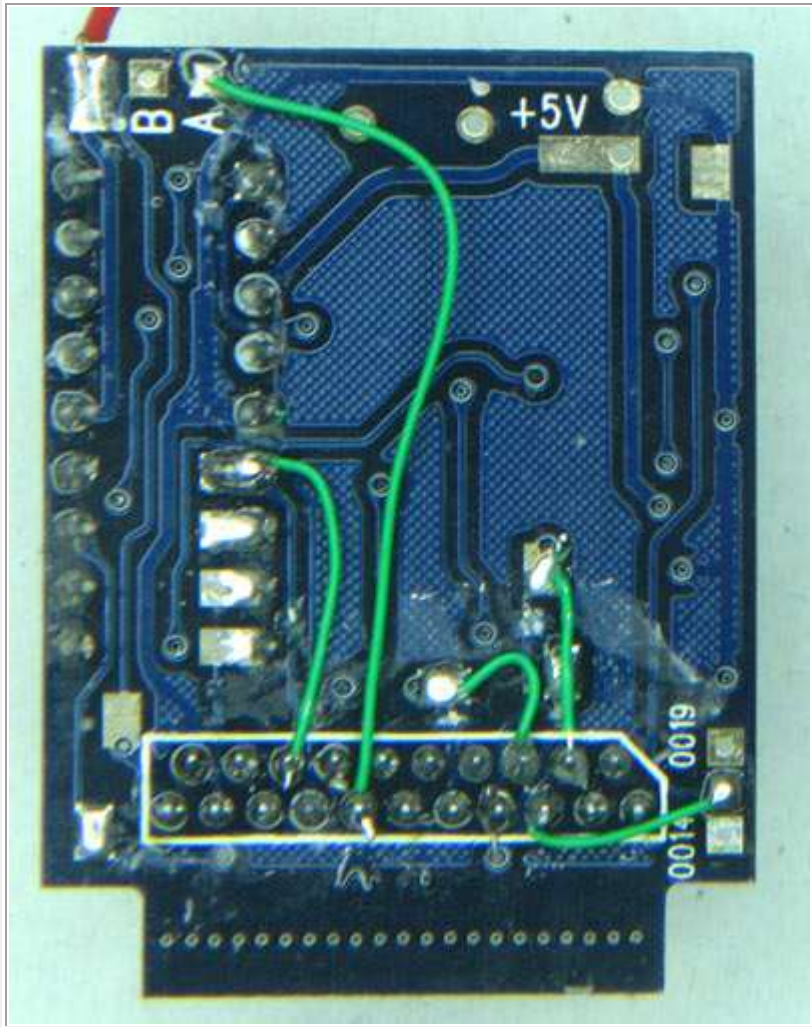
*Use Multi-Meter to test newly soldered jump to verify continuity.



Connect pin 12 157 ->Edge pin 18

30 gauge wire will fit through hole between 157 and Cap - solder may be already present in this location, heat to expose hole and solder.

*Use Multi-Meter to test newly soldered jump to verify continuity.



Back of Chip
Finished and wired example

The following instructions will tell you how to install the Mod Chip in a safer horizontal position. It is a long and tedious process that requires patience.

Brad's Notes: This is where this guide diverges from the typical Model 1 installation. The original creator of this guide used the following method to install the chip in a horizontal position. Two other possible solutions to the following could also be to A) file down the bottom edge of the modchip connectors so that the chip seats further into the motherboard slot allowing you more clearance room for the case thus allowing you to install the chip vertically or B) if some sort of Female to Female FCC Ribbon

Cable connector was available you could use that rather than soldering the FCC Ribbon cable to the Modchip. If you know of such a connector please let me know so that I may pass this on to others who wish to use the horizontal installation method.

Please note that if you are going to follow the guide you will also need to purchase the additional FFC (Flat Flex Cable). DigiKey is a great source for this and I would recommend checking the following:

FCC Specs: 20pos, 1mm, FFC DigiKey Part# WM10007-ND

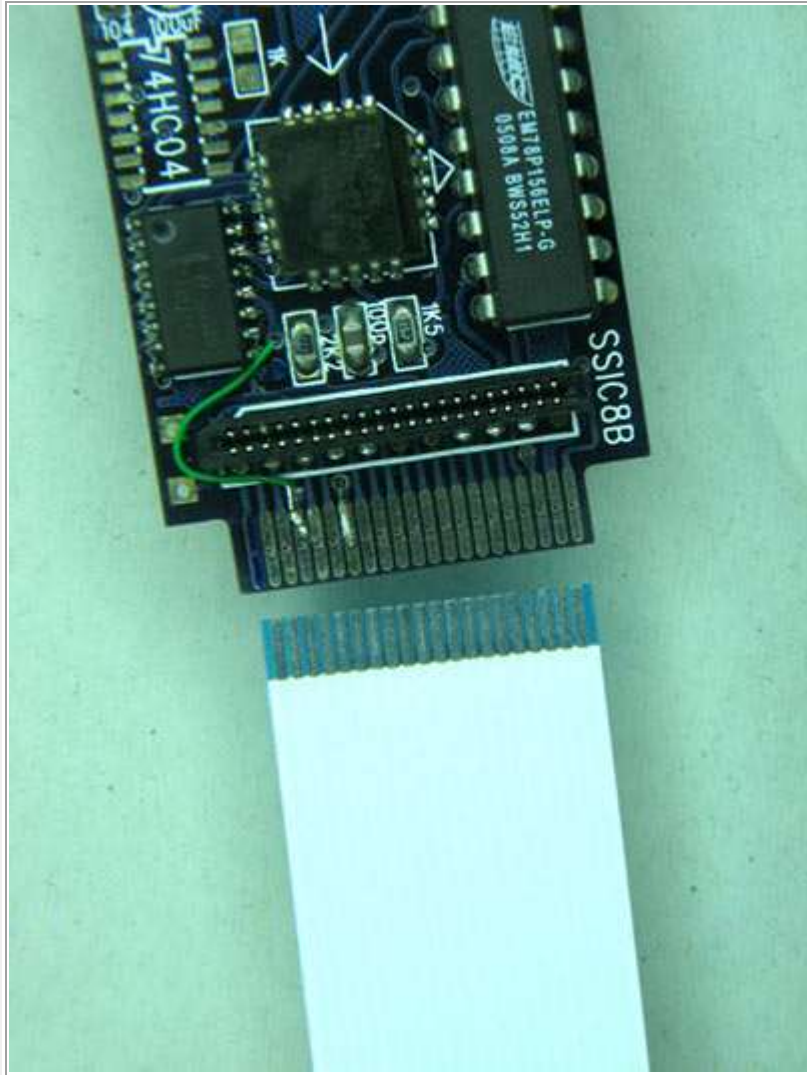
[4" length](#)

[5" length](#)

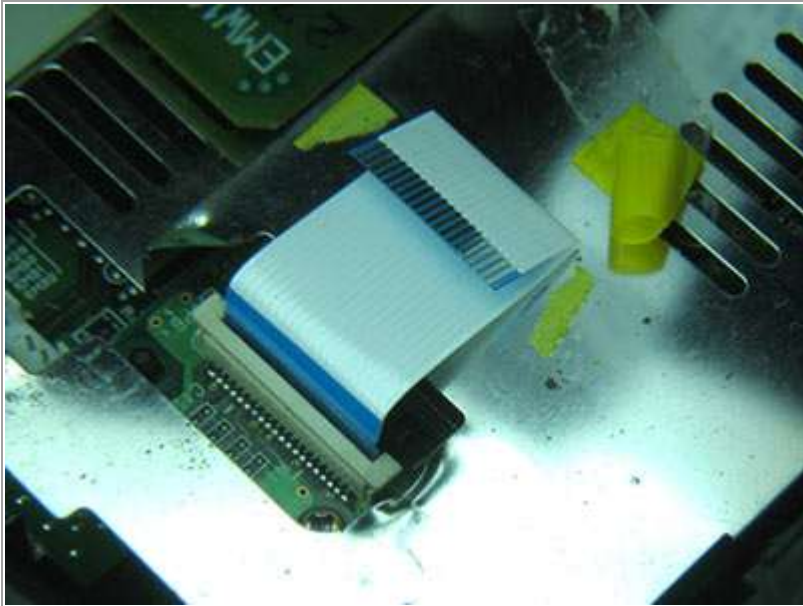
If you still would like to install your chip vertically, you will be putting it in harms way, as the Saturn's upper casing doesn't provide enough space.

To fit the chip in the motherboard vertically, the colored Edge pin will have to be cut with a Sharp Knife or Pointed Scissors to reduce the pin count to 20. Please still read ahead as there may be more hard adjustments needed to be done in order to fit the chip vertically. (please don't install it vertically)

I recommend the Horizontal installation:



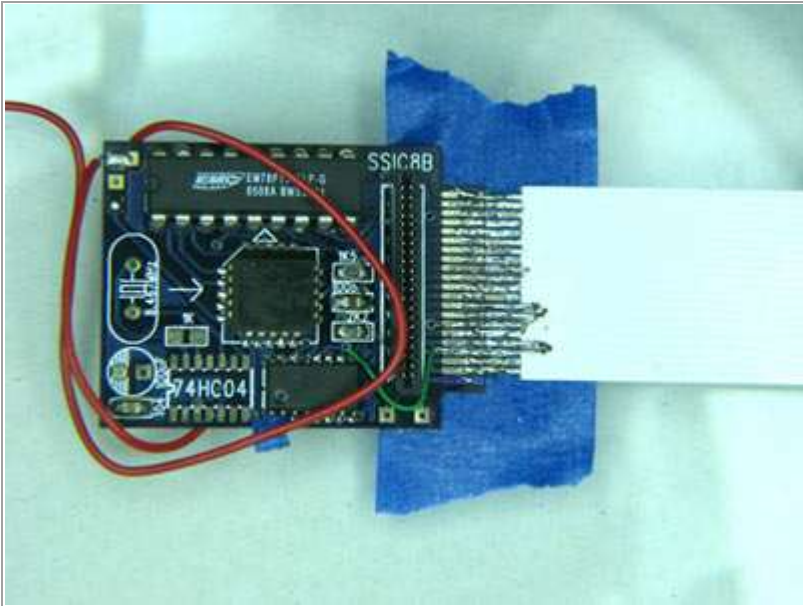
Match the 20 pin ribbon cable to the first 20 pins of the Mod Chip to make sure each pad lines up nicely. Again you will not be using the blacked out 21st connector pin.



This image illustrates how to position the ribbon cable once Mod Chip is soldered to it.

Like a 'Z' - with the pins facing UP

If you look at the metal around the connector, I once had a Mod Chip installed vertically - in order to "TRY" and fit it, I had to peel back the metal guard and melt a large section of the casing, but in the end the Mod Chip bent, broke and failed. - so please continue with the Horizontal installation. Done right this mod will last for the life of the system.



Tin each lead with solder making sure not to bridge any neighboring connections together on both the chip and 1 end of the Ribbon Cable. Too much solder and you will bridge connections.

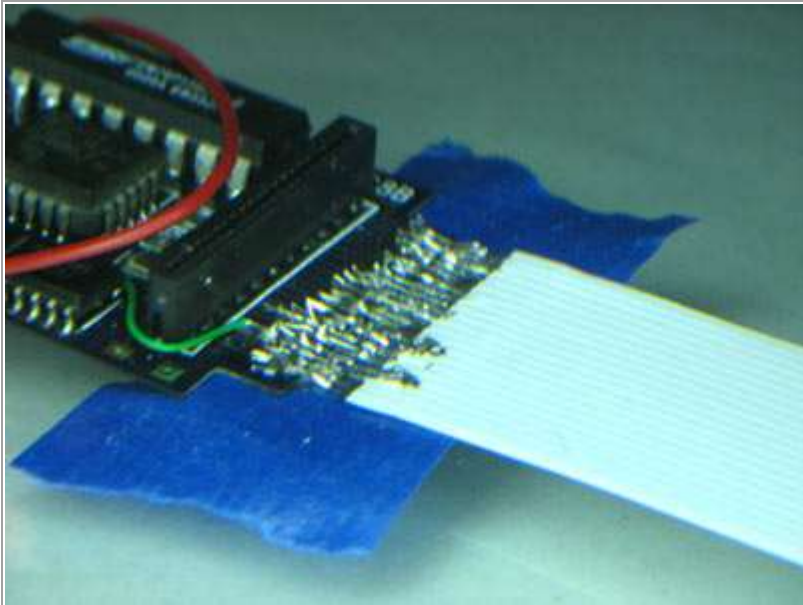
line up each pin 1-20 and use a piece of tape to keep them in position using a long piece of 30 gauge wire, strip the end and tin with solder, then lay across pin 1 of chip and ribbon cable and heat to bridge together the connections.

snip off excess wire with cutters - small needle nose may assist wire handling.

you can verify continuity by placing Multi-Meter lead at Mod Chips pin 1 and the other lead on the opposite end of the ribbon cable

Continue the above instructions until pins 1-20 are bridged

PATIENCE do not hurry! And do not bridge any neighboring connections!
A magnified glass may help.

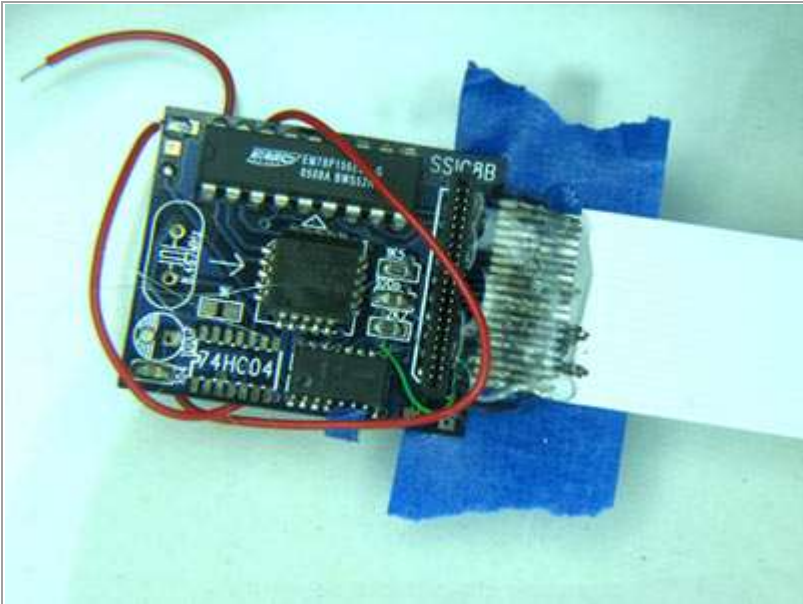


Mine is not that pretty, but it Works! Hopefully yours looks better than mine.

Now that each pin has been bridged, Check and Double Check continuity then do it again!

Start by using the continuity setting and checking pin 1&2, then 2&3 and so on to make sure no neighboring pins were bridged. Do this both at the location you soldered then on the opposite end of the ribbon cable. - if there are a few bridged connections try to separate solder lightly with the razor blade first, if that doesn't work, touch it with the soldering iron. Finally, you may have to redo it by using solder wick and re-apply solder if previous methods didn't help.

After verifying neighboring pins are not bridged, make sure Pin 1 is properly bridged from Mod Chip to end of ribbon cable; same with 2-20.



Now when the chip and cable have been properly bridged and nothing else, use your Hot Glue Gun and squirt a generous amount over the Chip and Ribbon Cable's solder connections. Make sure you were thorough with the above instructions before doing this. There is no easy turning back.

After Hot Glue had cured, just for fun, check the neighboring leads at the end of the cable 1&2, 2&3 and so on, to verify they are not bridged (none should be). if some are; it will be necessary to remove the glue and investigate. Only safe way to remove the glue is to heat it with a hair dryer - careful not to get too hot, as not to damage the chip.

The glue is necessary to keep connections secure.



Disconnect power and disassemble your Sega Saturn to access the motherboards laser port.

Lift the ZIF (zero insertion force) slot's edge (edge surrounding the laser assembly's port) to easily disconnect Saturn's laser cable.

Begin the "Z" bend shape (like illustrated in a previous step) and secure ribbon cable in ZIF slot

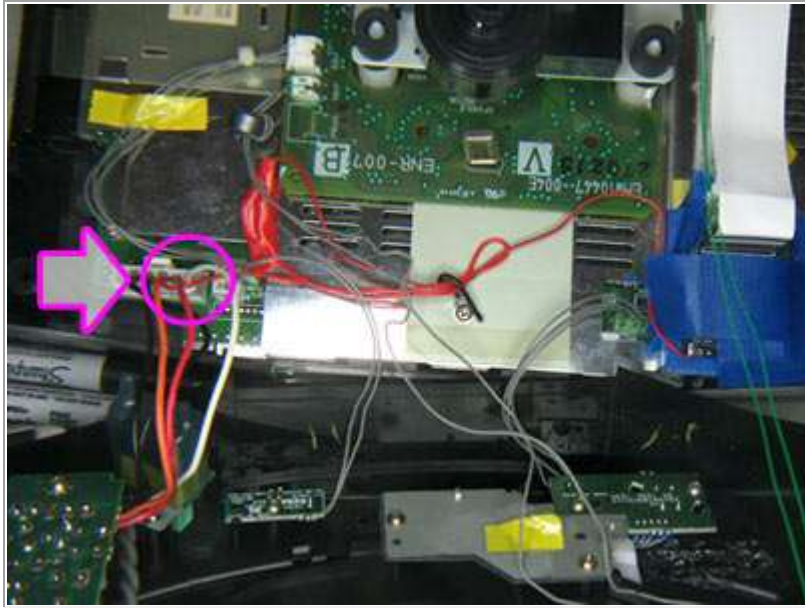
Lay down tape over ZIF connector area and where chip will be laid down with bend to protect bottom connections.



Use another piece of tape to hold chip down then carefully insert Saturn's laser assembly cable same way as it was in the Saturn's board.

Important: Make sure cable is positioned as close to pin 1's side as possible. There are 21 pins in this connector's port and you only need up to pin 20

Use more tape if necessary to cover top of Mod Chip, so no metal from the top casing piece bridges any connections (just a precaution).



There should be enough wire for your red lead to run to the Saturn's power switch. Strip the wire's end and place into same hole as the Saturn's red wire. Use a good gob of solder to join (don't get to crazy and do anything to drip solder on the motherboard).

Note: bottom right of picture, you will see a large melted area where I attempted to clear room for a Vertical installation that was not successful. You will also see 2 long strands of green wire. That was a mod for the fast disc switch that made the Saturn think the door was closed. (single pole, single throw switch) interesting edition as it helped me troubleshoot the operation. Also, my red Mod Chip power wire looks long because the wire from the last installation is acting as an extension.

Gently replace Saturn's upper casing and remember to replace any plugs unplugged during the disassembly. Have your connections to a television ready to go and before reinserting screws into the Saturn's casing, Test the unit for functionality - test an original retail disc and a back-up (if you have a back-up available). If they both boot, replace system's screws and try again and you are finished!!!!

Happy Playing!

Troubleshooting:

- If your first test run is not successful, take a day off. Frustration will only help you damage your system further. If you were careful and followed every above word of instruction, you should be fine.
- Disconnect any peripherals such as memory carts, action replays, modems, etc from the system and try again.
- If your disc doesn't spin, or you don't hear any laser activity. Make sure the ribbon cable was inserted properly into the system's motherboard.
- If a retail game boots, but not a copy perhaps an instruction was missed, a line wasn't severed, a jump wasn't made. - When mod chip in place, if a copy doesn't boot, usually the retail disc will not either

- If the system worked before you put the screws back in, disassemble and see if any connections came loose, if the mod chip is touching anything, or if it works again without the screws. There could be a possibility something in the way. Check clearance for wires and other additions related to the mod chip.
- If connections were correct and all above instructions were re-walked-through, no neighboring pins 1-20 were bridged, the ribbon cable was properly soldered to the chip (sorry, I don't know of the existence of a coupler) and all cuts and jumps were made. Perhaps there was damage made to the chip during the process. With the above pictured installation, I was super careful, documented every move (for this tutorial) and it worked the first time.

Credits: [Model 1 Saturn Chip Installation](#)

Disclaimer: I take no responsibility for any damages or harm that you may bring to yourself or your Sega Saturn Console by making the above modifications. All laws concerning the use of these chips and the back-up games they allow you to play are to be followed and I take no responsibility for any trouble you could bring