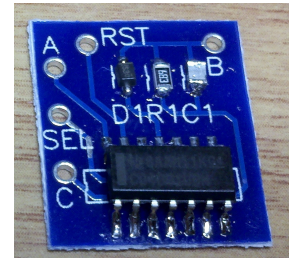


2011 “BlueBMW” and “thesteve”



Optional Control Board

(Please read! K Thanx!)

Installation of this region chip requires that you do some soldering of some very tiny wires and connections. If you are not skilled with a soldering iron, please have this installed by someone experienced!

(It has not been tested on each and every one of these!)

Laseractive PAC-N1**

*** Some issues have been reported with some SGX games when Pin 29 of HuC6280 is grounded as is required when modifying a Japan region console. It is recommended that you use a DPDT switch and use the second switch to switch between grounding or connecting the HuC6280 pin 29 connection.



Okay! Lets get started!

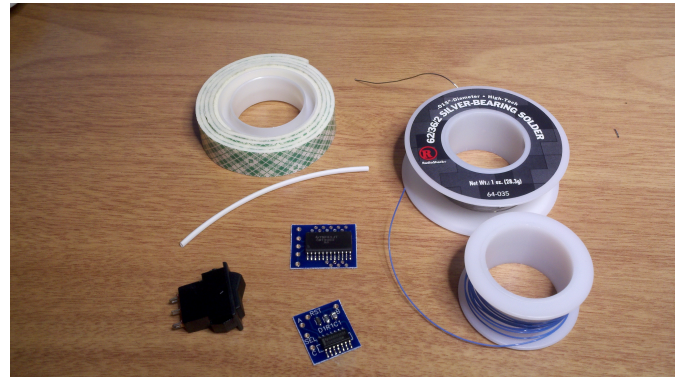
Parts You Will Need!

Console Installation

“Obey” Chip (Qty 1)
SPDT Switch (Qty 1)
26 gauge Wire (~ 5 ft)
Shrink Tube 1/16” Dia (3 inches)
Solder (smaller diameter is better)
Double Sided Foam Tape (for mounting)

Portable Installation (switchless)

“Obey” Chip (Qty 1)
Control Board Chip (Qty 1)
26 gauge Wire (~5 ½ ft)
Shrink Tube 1/16” Dia (3 inches)
Solder (smaller diameter is better)
Double Sided Foam Tape (for mounting)



Tools You Will Need!

Soldering Iron (15w – 30w max)
Desolder Braid (Useful if you use too much solder)
Snips (small sharp snips for cutting hucard slot pins)
Wire Cutters / Strippers
Drill / Files (for cutting holes for switches)
Screwdrivers (Philips and Flat) – Express / GT / Duos
Security Bit (4.5mm) – US Duo, CGFX, etc
Security Torx T10 – PC Engine Duo



A few more precautions!

Electronics are sensitive to static electricity! One little shock from your pinky finger can send an IC chip to the grave! Be sure to either use a grounding strap, or do I like I do and have a computer with a metal case nearby and touch it frequently to dissipate any static you might build up.

Working with electricity is dangerous! Now granted the voltages and such used on these systems is fairly low, they can still be dangerous if handled improperly. Most notably, there are some connections on the back of the Turbo Express screens that can give you a decent shock if touched. You shouldn't have the unit apart enough during this mod to expose those points, but just in case!



Zonk says: “LET US BEGIN HUMAIN!”

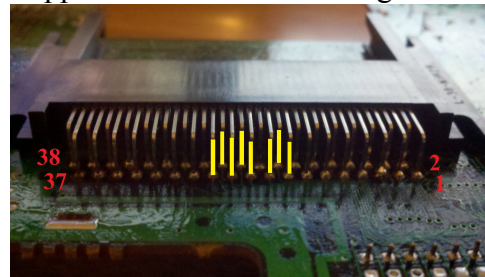
Console Installation



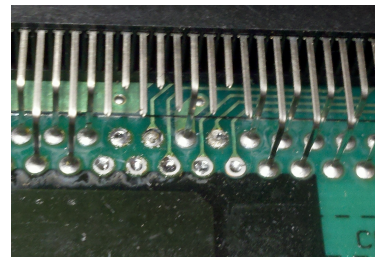
Before we can install the region mod, we need to extricate the motherboard from the system's shell. So to begin with, we need to unscrew and remove the plastic shell. This is fairly straightforward on these systems. Just be sure to remove every screw that secures the case together. Set your shell aside for now.

Once you have the shell removed, we need to remove the motherboard. By having the bare motherboard out of the shell, we can access the bottom solder points of the hucard slot. On most systems the motherboard is held in with several screws. On duo systems you will have to unplug the laser mechanism connections as well. On US Systems, there will also be large RF shields that will have to be removed. They are usually soldered on, so you'll have to heat the solder while pulling on the shield. If you are modifying a Japanese system, see the appendix at the end of this guide!

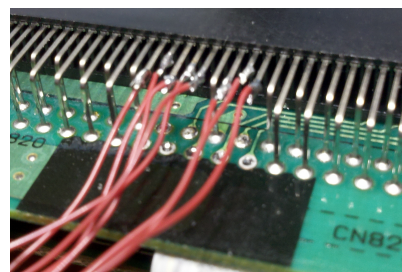
OK now the fun part! Locate your hucard slot and look for markings on the motherboard that indicate pins 1 and 2, and pins 37 and 38. We need to find pins 15 through 23. These are the pins we are going to be cutting, with the exception of 18! DO NOT CUT PIN 18. If you do, just solder it back together.



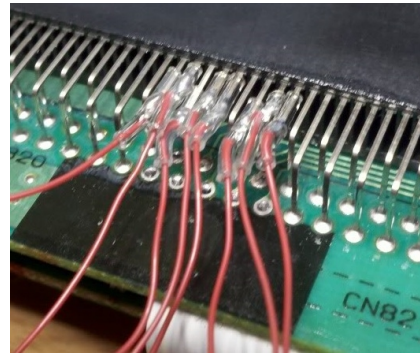
Now, we need to cut pins 15 through 23 excluding pin 18. I cut them at the 90 degree bend. Use some strong snips to cut the pins. They're quite strong. Once you have them cut, use your soldering iron to heat up the solder point on the motherboard for each one and remove the bottom half of each cut pin from the motherboard.



Now that the hucard slot is cut. We need to make 16 wires for the mod chip connection to the hucard slot. Cut 16 pieces of wire, approximately 3" long each and strip some of the insulation at each end. Solder one wire to each hucard pin we've cut. I've found that if you curl a small loop into the end of the wire, it makes it easier to solder to the hucard pins. I tend to use two different colors so I know which is connected to the motherboard, and which is connected to the hucard slot.



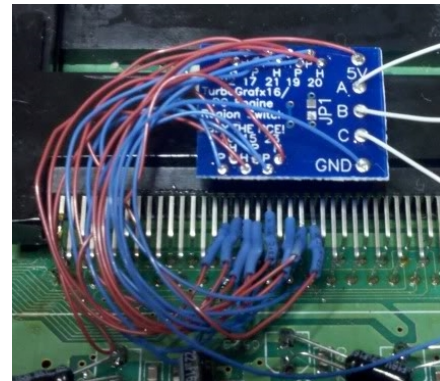
Slip some short pieces of heat-shrink tube over each wire connected to the hucard slot and shrink them. This will both insulate the pins from each other and help to keep the connection secure.



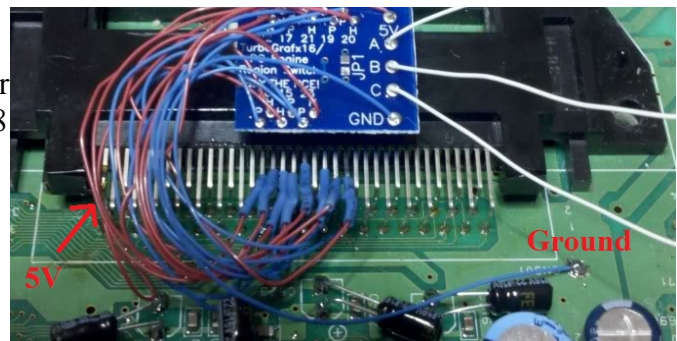
Now solder the remaining 8 wires to the holes in the motherboard where the hucard pins used to be! At this point, you may want to reinstall the motherboard into the bottom half of the shell. In the case of a Duo system, you may also want to reinstall the RF shielding plate.

Mount the Region mod chip in a secure location near the hucard slot. In a Turbo Duo, the RF shield over the hucard slot is a great place to mount the chip. Double sided foam tape works great for mounting the chip.

Begin soldering the 16 wires into the holes on the region mod chip. They are labeled with the pin number and have a “P” for PCB side (motherboard side) or “H” for hucard slot side.



OK now, we need to run a wire for 5V and for ground on the chip. 5V can be sourced from pin 38 of the Hucard slot. Ground can be found at pin 18 (the one we didn't cut) or on the main board. You may have to scrape away some of the coating on the main board to expose some copper to solder to.



Lastly, we need to wire in our SPDT switch! Mount your switch on your shell wherever you like and then solder wires from the 3 poles of the switch to the holes A, B and C on the chip. B should be connected to the center pole of the switch. A and C should be connected to the other two poles.



Note: Be aware of the routing of your wires. Make sure they don't rest on the heat-sinks protruding from the motherboard!

Reassemble your system and give it a try! If you put in the wrong region hucard, you'll just get a blank colored screen. So put your game in, try it and if it doesn't work just turn the system off, flip your switch and try again! If it works, then you've done it! Congratulations!

If it doesn't work, don't panic! Just re-check all your connections and make sure no wires had gotten pinched during the re-assembly of your system.



Portable “Switchless” Installation



This guide is tailored to the Turbo Express and PC Engine GT systems. I haven't tried this on a PC Engine LT system.

To begin with you need to remove your system's motherboard from the shell. Use caution when removing ribbon cables and connectors to make sure they do not get damaged!

Note: While working on an Express or GT system, try and not flex the ribbon cable between the main board and the hucard slot too many times. It will eventually fatigue and could break!

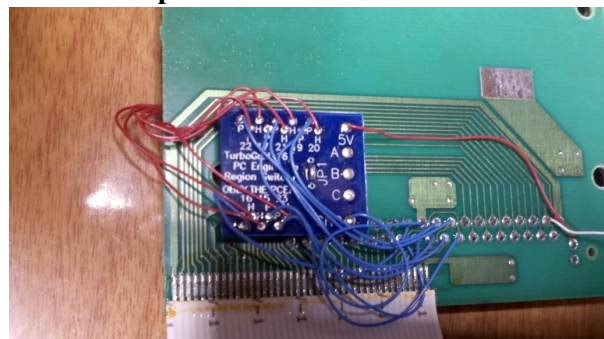
When using the switchless control chip, “JP1” on the main switch chip must be connected with solder! See the picture below!

From here, the procedure is similar to the procedure on a console system. The same pins must be snipped / removed and wires must be soldered to those same pins.

One difference on the portables is that I typically solder the wires that connect to the main board on the backside rather than the side with the hucard slot.

5V and ground can be tapped from the hucard slot pins, and are easier when soldered to on the back of the hucard slot board.

Pin 38 is 5V and Pin 18 is Ground!



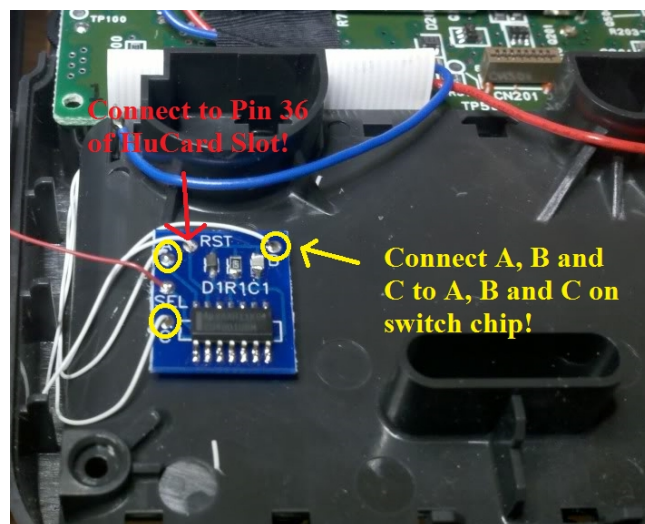
I typically mount the switch chip to the backside of the hucard circuit board. It will fit snugly in between the main board and the hucard board PCB when assembled. I recommend wrapping the chip in electrical tape, or using double sided foam tape on both sides of the chip to both secure it and insulate it from the two boards it rests in between.

If you need additional clearance, the RF shield plate can be removed permanently from the top side of the main board. (This may be necessary anyways if a capacitor change has been performed with leaded capacitors)

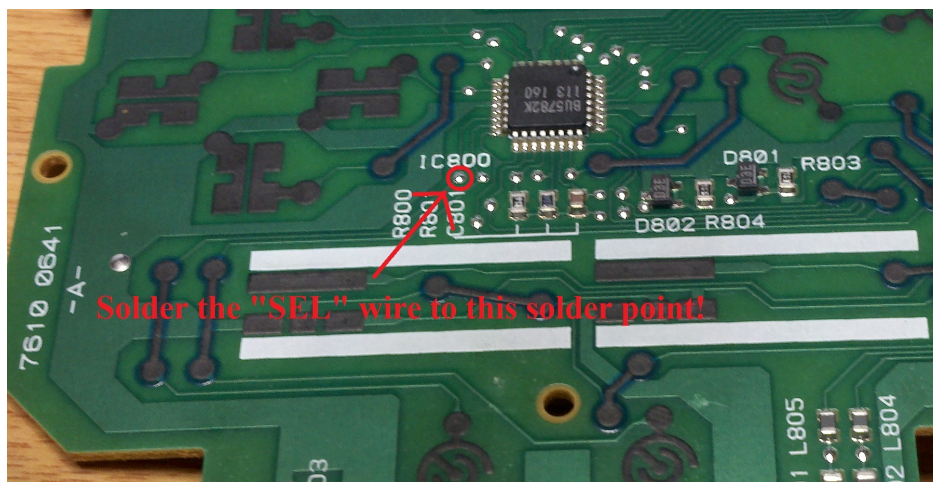
Now on to the switchless control chip installation! First lets mount the chip itself. I typically mount this chip behind the battery tray with a piece of double sided tape.

Run three wires from the switch chip holes A, B and C and solder them to the corresponding A, B and C holes on the switchless control chip.

Connect a wire from pin 36 of the hucard slot connection and run that wire to the RST hole on the switchless control chip.



Lastly, we need to run a wire from the "SEL" hole on the switchless control chip and solder the other end to the indicated point on the controller board. The solder point is right below the "8" where "IC800" is printed. You will need to remove the controller circuit board from the shell to access the solder point. Route the wire to where it wont get pinched during assembly.



Now that all these connections are made, reassemble your system, put in some batteries and test it!

The way this region switch works is, if you insert a native region hucard, the system will operate as normal. If you insert a hucard from the non-native region, you need only hold the select button while powering the unit on. Its as simple as that!

One small caveat. If you are using a non-native region hucard and you quickly turn the unit off and pop in a native region hucard, the system may not switch back to the original region immediately. This is a limitation of the design. There is a capacitor that must discharge before the region will revert back to the native region. Wait 5 seconds before turn the system back on and you wont have a problem.

Also, when running one of these systems on batteries, if your batteries get discharged to the point where the screen starts to get brighter and brighter, the system may freeze up. This is because the voltage is too low for the switch chip to operate correctly. If this happens, change your batteries!

Appendix A

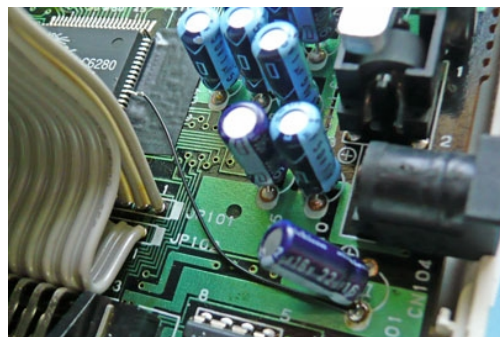
Additional Modification Required on Japanese Systems only!

On all Japanese systems, one additional modification must be done in order for the region switch to work. This requires that you carefully heat and lift a single pin of the HuC6280 chip and connect it to ground through a piece of wire.

Locate the HuC6280 chip (it is on the bottom side of the motherboard on some models) and carefully lift Pin 29 from the motherboard. A razor blade or scalpel works perfect for this. Just apply a little heat from your soldering iron to the pin and lift it up with your blade.

Be very careful not to the break the leg off!!

Connect a piece of wire to the lifted leg and connect it to a ground point!



(Pictures sourced from <http://www.mmmmonkey.co.uk/console/pce/region.htm>)

Legal Nonsense....

I assume absolutely NO liability if this chip somehow damages, destroys, or makes your console malfunction in any way, or if it causes any other damage, calamity, disruption, interference, alien invasion, meteor strike, spousal dispute etc etc etc. We have tested this chip on multiple systems and have had 100% success with them! I test the connections on each chip before I send them out! If you have any trouble at all, please don't hesitate to contact me (BlueBMW) via the pcenginefx.com forum. Pcenginefx.com and its associates are in no way affiliated with me, NEC, Pioneer, Hudson etc etc etc! The creators of this chip are also in no way associated with the aforementioned entities! We're not trying to cause trouble, we just want to play games!

Please don't sue me!

- 2011 BlueBMW