

Atari 850XL/1250XL Remix

Assembly Instructions

General assembly steps:

**** For the 1250XL, leave these parts to solder in last CR6, VR1, Y1, SW1 and J4 1200XL cart shroud ****

**** For the 850XL, leave these parts to solder in last Y1, VR1, SW1 and J15 ****

Always start with the axial parts first, namely the resistors, inductors, axial capacitors and then diodes.

Then you can start going vertical, starting with the chip sockets, resistor array SIPs, and the shorter radial electrolytic caps.

Next install the transistors and the remaining radial caps and inductors.

Now you can install the various connectors for the SIO, joysticks, power, video out etc. Don't forget the single inline male headers for the AUX SIO and the female socket for the PBI Riser connector. Leave the 1250XL cart assembly out for now. Do not install the 850XL cart guide yet either.

Specifically, for the 1250XL, you will need to assemble the PBI Riser daughterboard, but do not plug it into the female socket yet.

You can also install the optional male headers for the add-in boards at this time if you like, whether you plan to use them or not. It helps avoid removing the board from the case later on to solder them in then if you later choose too.

At this time, you will most likely have a very flux messy bottom of the mainboard. You would do well to clean as you solder, but if you are

fortunate to have a sonic cleaner big enough then now would be the best time to run the board through a cleaning cycle. Do the same with the PBI Riser board.

On the 1250XL the last soldering steps (after the sonic bath) will be for the CR6 voltage regulator, VR1 color pot, Y1 main system clock and SW1 main power switch.

On the 850XL the last soldering steps (after the sonic bath) will be for the SW1 switch, VR1 color pot, Y1 main system clock and J15 stereo audio out connector.

Now before you go any further, double check all your solder joints, looking for dry, incomplete solder flow, bridging(shorting) and completely missing solder on pins that should have them. You will likely have a few. Take your time. There are a lot of solder points. Touch up as needed.

Do a visual check of the top of the board. Are you missing parts that should be soldered in? Fix it.

850XL/1450XL Power Supply Assembly:

See the separate instructions on 850XL/1450XL power supply assembly.

Do not use the 800XL/130XE power supplies here. They do not have the +12V DC output for the speech chip and do not have the proper pinout for these boards.

Smoke Test:

All you are going to do here is verify that you do not have a short and then check that you have proper voltage going where you should.

Do not connect power to the board yet. First using a multimeter check for shorts between +5V pin and GND pins on several of the logic chips. If you register a near dead short, find the problem and fix it before you go any further.

If not, then the next step is to check that you are getting +12V on the Speech chip socket pin 1 (U28 on the 1250XL or U27 on the 850XL) and you have +5V on the other chip's power pin. Place board on a non-conducting surface. Plug the barrel (DIN) connector of the power supply into the power input on the board. Make sure the power on switch is in the down position (OFF), Plug a surge suppressor into wall power and make sure it is off. Usually there is a light that indicates it is powered. Then plug the power supply's AC plug into an open socket on the surge suppressor. This will give you and the rest of the house some protection in case something bad goes wrong here.

Switch your multimeter to DC voltage measurement setting. Switch the surge suppressor on. You should see an indicator light come on the power supply. Carefully switch on the board power switch. Assuming you haven't swapped diode direction or a electrolytic cap blows, you should be able to verify +5V on all the chips' +5V power in pins and +12V on U28(U27 for 850XL) socket pin 1.

If not then remove power and do a visual check to see if you have a diode in the wrong direction, or other errors. Repeat testing and troubleshooting until it passes.

Pat yourself on the back if there are no problems with voltage. You are about 3/4s of the way done. Unplug power and go to the next step for your model.

1200XL Cartridge Shroud Installation Only:

There are three options here:

1. Original shroud and cartridge connector
2. 3D printed shroud and original cartridge connector
3. 3D printed shroud and equivalent cartridge connector

This can get kind of tricky, mainly because the cartridge connector (original or equivalent) pins are long, right angle and dual row, making it hard to finesse into the proper hole on the main board when enclosed in the shroud. I created a very simple brace pcb that should make it a bit easier. It will work with both the original shroud and the 3D printed one.

@ScreamingAtTheRadio creator would be best at describing how to assemble both his 3D designed shroud and equivalent cartridge connector combination. Please see his github site [here](#). And here's the Atariage post where he offers up other [cartridge guides etc](#) .

I have used both his 3D printed shroud and the 1200XL original shroud with an original cartridge connector only. I saw no appreciable difference between the two, but his equivalent cartridge connector is a different story. Not bad really, but with the demise of the de minus exception it is too costly for me to order the specific parts he recommends.

You may be fortunate to be able to desolder the 1200XL cartridge connector from your salvage 1200XL board. I made a mess of mine, rendering it unusable.

So, I braved the perilous action of ordering from Best Electronics for the 1200XL Cartridge guide and connector. He was out of the 1200XL cartridge guide, but still had the connector, which was fine. Expensive still, but fine. I could adapt and did so. I printed the 3D cartridge guide up in a jiffy and had it ready for when the connectors arrived.

I am working on a Youtube video on the process of assembling the guide and connector and brace pcb on a bare mainboard to avoid as much distraction as possible. This should help with your cartridge shroud assembly, but you will be soldering the assembled unit onto a populated board, so take it slow and easy. Stop when you feel the anger building and try again later. You can easily break the 3D printed shroud.

Chip Programming and Assembly:

Four chips need to be programmed with custom code for the computer to function properly. One is a 24pin Prom with the PBI handler coding and the

other three are substitutes for logic chips. I have not modified them in anyway. But @tf_hh was able to translate the original PAL code into a format that more modern programmable chips could understand.

You will need a programmer such as the TL866II to program them. Check that the programmer you want to use can program the part number of the chips first. Have someone else program them or purchase a compatible programmer if you can't.

Assembling the chips into the board is fairly simple. Take your time, double check that you are inserting the correct chip into the correct socket and make sure you have all the pins pointed into the sockets. Make sure of your chip orientation too. Bad things can happen if you have a perfect insertion into the socket, but the chip is backwards or it's the wrong one.

For the first chip assembly I recommend using only the necessary chips, not the optional ones. That means the original Atari custom chips not remixes or standins. This helps keep the troubleshooting to something reasonable and if you ask for help on AtariAge, they can help. Only after you have verified it is working with the standard custom chips should you swap out for the optional ones.

This assumes that you are installing known good chips. Even brand new chips from Mouser/Digikey can be bad. If you have the Backbit Pro chip tester, it can handle almost all the chips on this board. The exceptions being the following chips, U4, U5, U6, U7, U11, U12, U23 and U24 on the 1250XL and U4, U5, U6, U7, U8, U11, U12, U18, U22 and U23 on the 850XL.

Once all the standard chips have been programmed/installed, you can move to doing the first power on test.

First Power On test:

Now you are finally ready to test whether the time, money, blood, sweat and tears you have put into this project has initially pay off.

With the board on a non-conductive surface, connected to a compatible monitor hooked to the monitor port and the same power on setup described above, you are ready to do the test.

Carefully turn the power switch on. You should momentarily hear the SIO search activity and see the blue screen and Ready prompt show up on the monitor. If it's a weird color, you will need to use a non-metal tweaker to adjust the color pot(VR1) until you get white text on blue screen.

Anything else is a troubleshooting journey and may take you to the ends of the earth or may simply be a quick spotting of a missed solder point.

Assuming you have good power up, the next steps consist of temporarily removing power and monitor connections. Next you will insert the PBI Riser board and assemble the mainboard in a 1200XL case that has been modified to allow access to the PBI. Install the 1200XL cartridge alignment piece. At this point you do not need to screw the top and bottom case together, but you will need to connect top case keyboard and led cables to the mainboard. Take care to match cable orientation with pin one on the mainboard for both the keyboard and led connectors.

Now you have a stable platform to do further testing of the basic 1250XL configuration. Once you are satisfied with the 1250XL standard configuration operation, you can close the case up or start adding in the optional add in boards.

Conclusion:

After finishing the ultimate reverse engineering challenge of making a replacement mainboard for the 1450XL, I had to acknowledge that very few would be made due to the fact that no readily available cases were to be had. With these two remixes that limitation has been seriously reduced.

The 1250XL and 850XL are a subset of the 1450XL computer line. They are hybrids. Most of the modifications are simply to fit the board space available. But some features have been removed, such as the built-in 300 baud modem, RF module and the PBI parallel floppy drive connectors. Other features were added, mainly to more easily accommodate enhancement

boards such as the PokeyMax, UGVII, U178 Midi, PALBurst and Sophia without having to solder additional wires to the mainboard.

These connections are just more hardwired than a temporary solder job from add-in board to mainboard, so should not affect the operation of the add-in board itself. ie If the add-in board is mis-connected (fix it) or bad you need to take that up with the creator.

I have been told that unfortunately the U1MEG addon will not be compatible due to the way the 1450XL handles the PBI bus. You may have other issues with PBI devices. I cannot test all such devices simply because I do not have them in my possession. Other-wise the 1250XL/850XL should function as any normal Atari 8Bit computer would.

I will monitor AtariAge for individuals that are having problems assembling their boards and try to help as best I can. But I am limited by the fact that this is not hands on troubleshooting. Pictures are helpful, but I'm still not in the room with the board in my hand to touch and see. Believe me I've managed to short, not solder whole rows of solder points, solder in wrong parts etc so I know how easy it is to do that.

I won't waste time trying to help someone who doesn't understand the basics of electronics, much less how to solder or how the Atari works. This is after-all a DIY project. It is not a hard project, but it does require some degree of electronics knowledge, Atari specific knowledge and soldering skills. If you don't have that, then get someone else who does to assemble and do the testing for you. You're wasting your time, money and sanity and your wife's/husband's good graces otherwise.



