

I have used this procedure to upgrade my PCjr to 640k, and have found it to be better than the others I have seen. Please follow the directions completely, there is genius in their madness!

I have added some notes to this in places, I've marked my notes with a *** to set them off from the original text.

If you have any questions about this procedure, leave me a message on the system or in case of emergency I can be reached at home on 668-1582.

Joel Mock

If you have upgraded your IBM PCjr to 256K with IBM's 128K memory sidecar you are in luck. IBM designed the 128K memory board to support both 64K DRAMs and 256K DRAMs although this fact is undocumented. The upgrade requires replacing the 64K DRAM chips with 256K DRAM chips, cutting a jumper trace and adding a jumper wire. We, Turning Point Logic Corporation, have upgraded two IBM PCjr's from 256K to 640K via this method with excellent results. If you are interested in upgrading the directions are given below.

WARNING: THIS UPGRADE IS FAIRLY DIFFICULT AND SHOULD ONLY BE ATTEMPTED BY THOSE WITH SUBSTANTIAL SOLDERING AND CHIP REMOVAL EXPERIENCE. IN ADDITION THIS IS NOT AN IBM SUPPORTED OR ACKNOWLEDGED UPGRADE AND THEREFORE THIS UPGRADE IS PERFORMED AT THE USER'S OWN RISK.

*** ALSO PLEASE NOTE, IF YOU HAVE A SERVICE CONTRACT WITH IBM, ANY FAILURE CAUSED BY THIS CHANGE WILL NOT BE COVERED BY THE CONTRACT. IF YOU MUST HAVE YOUR MACHINE SERVICED, MAKE SURE THE CONVERTED BOARD IS NOT THE PROBLEM. THEN REMOVE IT FOR SERVICE. THIS WILL AVOID SOME STICKY PROBLEMS.

UPGRADE DIRECTIONS

1. Tools needed (if you do not have these tools then please do not proceed, this procedure is very delicate and it is VERY EASY to DAMAGE the board).

- a. Small screwdriver
- b. A good pair of side cutters
- c. A good soldering iron
- d. Solder
- e. A good solder extractor
- f. An X-acto knife
- g. A small pair of needle nose pliers or tweezers.

*** A good static safe work surface is also a good idea.

2. Parts needed.

- a. 16 - 16 pin low profile solder tail sockets (sockets are not necessary but are advantageous if a memory chip is bad or found bad).
- b. 16 - 16 256K DRAMs 150 ns
- c. A small piece of 28 or 30 AGW wire (1" is more than adequate).

3. Power down the PCjr and disconnect the power cable.

4. Remove the IBM 128K memory option sidecar.

5. Completely unscrew the four mounting screws.

6. Remove the interior sidecar panel with a small screwdriver. The panel is held in by eight tongs; four on the top, four on the bottom.

7. Remove the printed circuit board from the sidecar case.
8. Using a pair of side cutters (we highly recommend purchasing a good pair of side cutters, if you do not have a pair, before attempting this step. They cost about \$10 and can make the difference between success and failure of this project) completely cut legs of all of the installed 64K DRAM chips. Do not attempt to salvage the 64K chips. Cut the legs at the edge closest to the DRAM chip, NOT by the board.
9. With good electrical solder, re-tin the solder pad at each cut leg. This step may seem a waste but makes the overall job of removing the cut legs and solder much, much easier. Please take the time of performing this step - we did not with our first upgrade and it took eight hours to complete compared to two hours for the second upgrade.
10. With a pair of needle nose pliers or tweezers and a soldering iron, remove each cut leg. Apply the heat of the soldering iron from the component side. Grip the leg to be removed with as little contact of the pliers as possible. The pliers become a heat sink and the less surface contact of the pliers with the leg the less heat drawn off by the pliers.
11. Again re-tin all of the solder pads with a fair amount of clean solder. Taking this step make take a longer amount of time in the short run but can save a significant amount of time and headache in the long run.
12. Remove all of the solder from the holes with a solder iron and solder extractor.
13. With a lightly tinned soldering iron apply enough heat to each hole so the remaining solder melts around the edge of plated through hole and solder pad.
14. Scan the bare solder holes and surrounding area for loose pieces of solder. This loose solder can be a killer for it can cause intermittent shorts which are near impossible to locate once the sockets have been soldered in. Use the soldering iron or an X-acto knife to remove the excess solder.
15. Solder in the 16 low profile solder tail sockets.
16. With the component side of the board facing you there is a set of three plated through holes to the right of the big chip (SN74S409N DRAM Controller) with a white rectangle drawn around them. This is a jumper which determines whether 64K or 256K DRAMs are used. Currently there is a foil on the component side which connects the left and center holes together. Completely cut the foil which connects the two holes with an X-acto knife.

*** If this is not done an error message surfaces during the rom boot sequence
 *** instructing you to, among other things, check your memory switches
 *** So take the time to ensure this is cut completely.

Then solder a wire between the center hole and the right hole. The diagram below should give a better idea where the jumper is located.



*** The memory controller may not have the same number on it due to
 *** in line production changes, but it is the biggest chip on the board.

17. Install the 16 256K DRAM chips into their sockets. Be sure each chip is oriented properly (the notch indicating pin 1 should point upward).

18. Set all four DIP switches on the rear board to their on position (OPEN).
19. Reinstall the PCB back into the sidecar case. Note that in one of our upgrades we found that the pins of the DIP switch were shorted with the strip of gold "fingers" located in the sidecar case. The purpose of the gold fingers is to ensure contact between the PCB and the sidecar case. It may be advisable to place a small piece of electrical tape over the 8 pins of the DIP switch on the foil side of the board.
20. Reinstall the sidecar onto the PCjr.
21. Reconnect the power cable.
22. Turn on the PCjr and verify that power-on diagnostics find 640K of memory with no errors.
23. It is then advisable to run the special diagnostics (CTL ALT INS) for several hours. If the special diagnostics do not find any errors then the memory should be usable.

*** The diagnostic "LOOPTEST.EXE" found on the IBM memory options disk
*** is also a good test of storage integrity (I find it to be better)