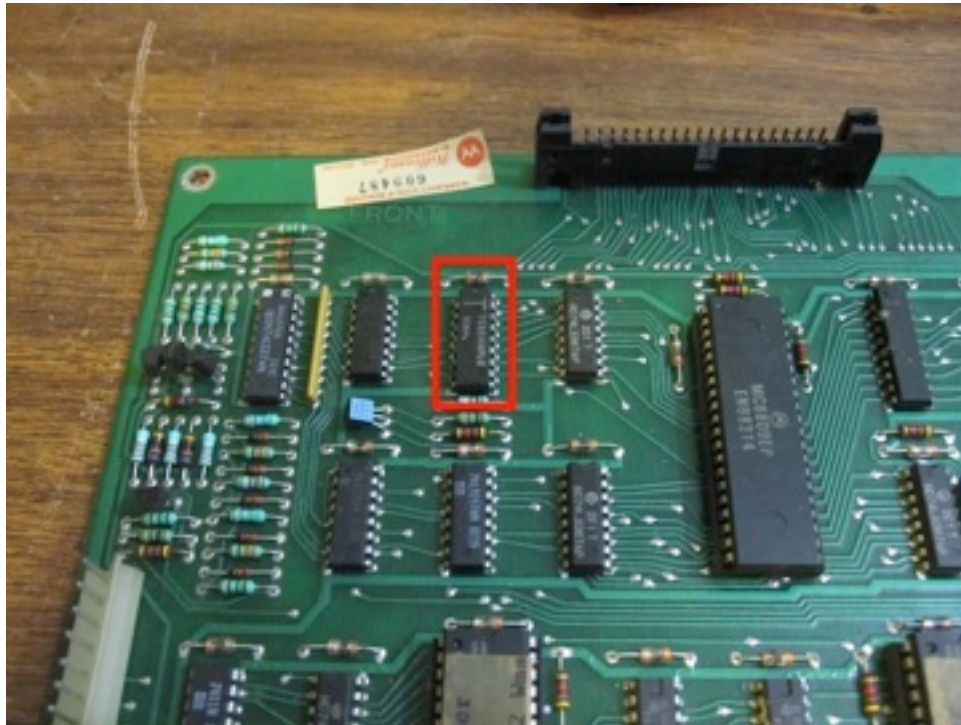


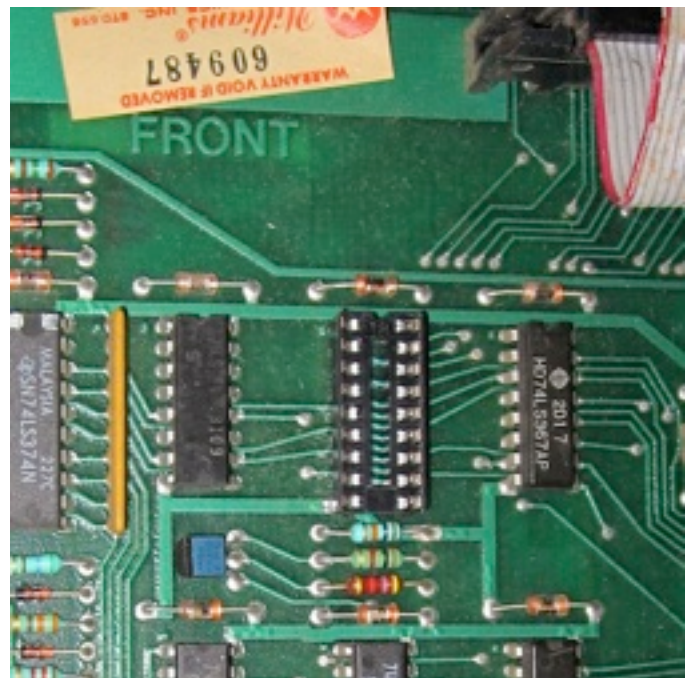
Williams 5114/5514/6514 NVRAM Adapter Installation

1. Remove the AA batteries from the holder on the CPU board.
2. Locate the 18-pin CMOS RAM chip (usually a 5114, 5514, or 6514 at location 1C) on the CPU board.



3. Desolder the CMOS RAM chip and replace it with the 18-pin DIP socket provided. Install it with the notched end facing the same direction as the original chip.

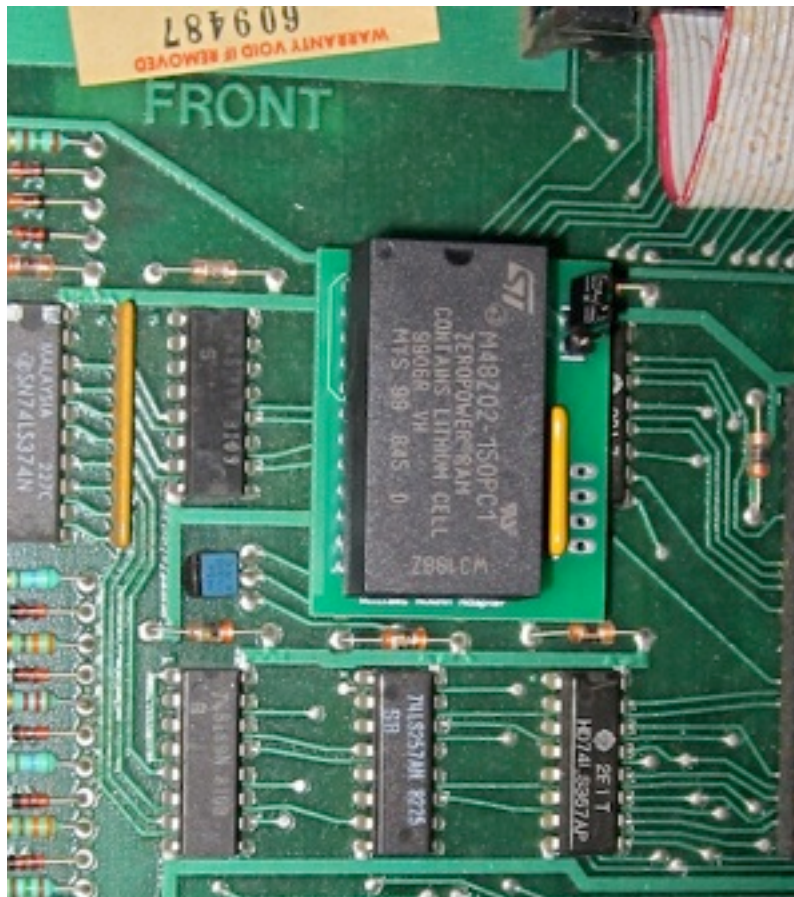
Note: If you don't have a desoldering tool, it is recommended that you cut each leg off the CMOS RAM as close to the chip as possible, then remove each leg from its hole in the PCB by heating it from the bottom with a soldering iron and pulling it out from the top side using needle nosed pliers or tweezers.



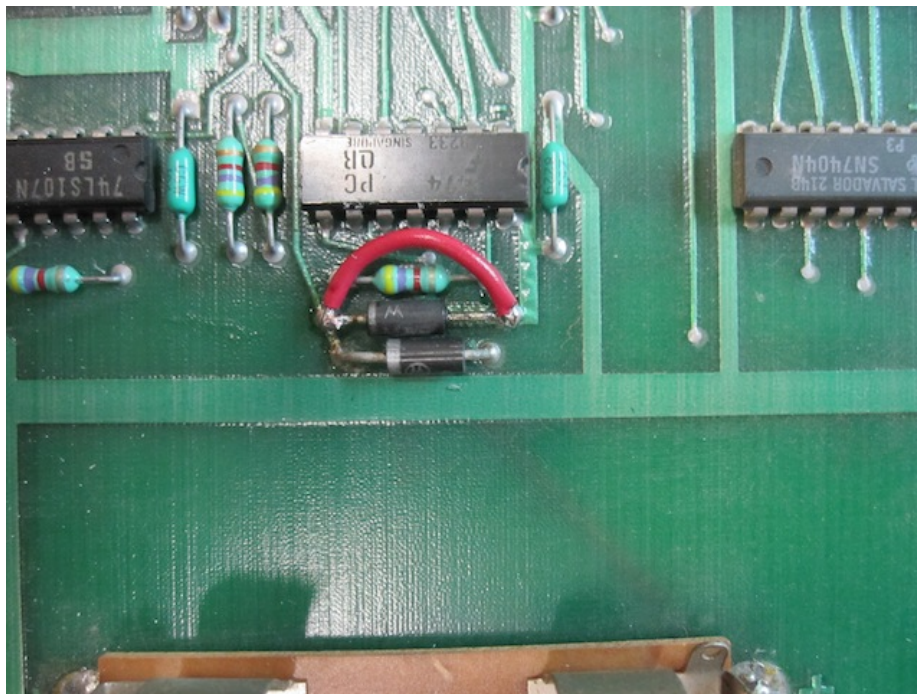
4. Insert the NVRAM chip (M48Z02) into the 24-pin DIP socket on the adapter, making sure the notched end of the NVRAM faces the notched end of the DIP socket. This step may have already been done before shipping.



5. Install the adapter into the 18-pin DIP socket on the CPU board, again making sure the notched end of the NVRAM faces the notched end of the 18-pin DIP socket.



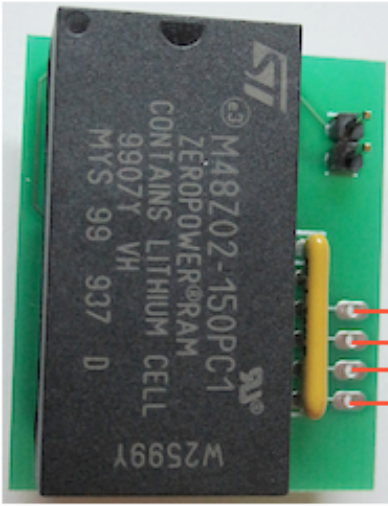
6. When powering up the game for the first time, it will display “Factory Settings Restored” and will reset the settings and high scores. Use the Advance button and controls to configure the game options. (free play, difficulty, etc.) Power the game off, then after a few seconds power it back on to verify the saved settings are restored.
7. Although it’s usually not necessary, you may need to jumper the diode at D9 on the game PCB. Since this diode is in the path of the 5V supply going to the CMOS/ NVRAM, it may cause enough voltage drop to put the NVRAM into power-fail deselect mode. If you find that your settings and high scores are still not saved correctly after installing the adapter, simply solder a wire across the leads of diode D9 (located near the AA battery holder) to bypass it.



8. Optional: To create a separate set of options and high scores in “upper memory” of the NVRAM, (e.g. for different pricing or difficulty settings) power off the game and install the jumper to short the header pins on the adapter. Power the game on again and configure the options using the Advance button and controls.

“Bubbles” boards only:

Bubbles boards use a bus that is 8 bits wide, so there is an additional CMOS chip located at 0B to accommodate the other 4 data bits. You must remove this additional CMOS chip from the board and connect wires from the holes for pins 11, 12, 13 and 14 to the 4 points shown on the NVRAM adapter. The order of the wiring is not important.



1C

