MITS Altair 8800 Restoration

## Power Supply

Replace all tantalum-electrolytic capacitor with new parts.

 Replace the capacitors with the largest values you can find. Maximum length is about 50mm (2in).

 6 Each 10,000/16v Axial Capacitors. C1, C2, C3, C4, C9, C10 (Or larger)

 2 Each 4,700/35V Axial Capacitors. C12, C14 (check polarity of C14!)

Replace bridge rectifier with a chassismounted 25-35amp rectifier. Run 14awg DC wires direct to back side of power supply board*.* Use.250 in push-on connector to connect to DC side of bridge rectifier.

 GBPC35-02 is rated at 200v, 35amps

MDA990-2 is rated at 200v, 35amps.

Replace the 4 diode (D1-D4), on the +8Vb line with 1N5392 or SR204-TR series devices. These are rated at 1.5 to 2amp each. The 1N4002 devices get hot and are not rated high enough to drive the front panel load.

Wire the two green 8VAC wire’s from the transformer direct to the bridge rectifier, bypassing power supply board. You will need to add some wire to the existing leads and add .250 in push-on connectors to connect to AC side of bridge rectifier.

Replace AC fuse on power supply board with an in-line fuse holder, bypassing the power supply board. This is a major safety item!

Add a cover to Cinch connector strip. This is a major safety item!

 Cinch MS-10-141. Plus some longer screws, nuts and spacers.

Move the AC wires to the front panel power switch so they are not near the DC power cables. Make sure that they are 18awg or larger.

Make sure the wire size from the power supply board to the terminal strip follow the guideline on wire size.

Remove old flux from board with a flux remover.

If the board has sockets for the IC’s, remove and re-installed each IC to allow for better contact. If you can, replace all parts with faster and lower power 74ALSxxx or 74LSxxx parts.

## Power Supply Option’s

Replace the power supply motherboard and transformers with modern switching power supply. These can easily be installed on the chassis rail that the old power supply motherboard was mounted too. (This will also give you 120V/220V flexibility.)

 Suggest:

Mean Well SP-100-7.5, adjusted to 8V @ 13amps

Mean Well T60-C, adjusted to +16V @ 2amps, -16V @ 0.5amps.

(+5V@5amps unused)

## Front Panel

Put some tape or epoxy over back of AC power switch. This is a major safety item!

Replace the TO-220 voltage regulator. Recommend an STMicro L4940-5.0 or LM2940-5 LDO voltage regulator. These parts run cooler that the older 7805. They have a voltage drop of only .5V verse the 2.0V for the 7805. This also gives us more headroom on power supply margins. Make sure it has a heat sink.

Replace any tantalum-electrolytic capacitor. Add a 470uf/16v or large capacitor to input side of the voltage regulator. Also add a 470uf/10v or large capacitor to the +5V output at the voltage regulator. Replace any .1uf bypass capacitors that need replacing with new ceramic capacitors.

Remove old flux from board with a flux remover.

Replace the +8v power wires to front panel with 18awg or larger wire.

## Mother Board

Replace DC power wires to motherboard with 14awg or larger wire for +8V lines and 18awg or larger for +16V and -16V lines.

I recommend that the motherboard be replace with one with active or passive termination of the S-100 bus. Old MITS Altair un-terminate motherboards will be nothing but problems. An active terminator can be built on an old S-100 proto card that is plugged into the last slot (it’s a lot of work, but its worth it!). See motherboard information at [www.s100computers.com](http://www.s100computers.com) for information on how to build an active terminator.

## Chassis

Replace the 120mm fan with a new silent low flow unit with plug on power connector. I used an Orion, OA125AP-11-3TP or 2TP.

Replace feet on bottom of chassis.

## Card’s

Replace the TO-220 voltage regulator. Recommend an STMicro L4940-5.0 or LM2940-5 LDO voltage regulator. These part run’s cooler that the older 7805. They have a voltage drop of only .5V verse the 2.0V for the 7805. This also gives us more headroom on power supply margins.

Replace all tantalum-electrolytic capacitor.

Remove old flux from board with a flux remover.