RadioShack 22-510 Switching Power Supply Teardown

This teardown exposes the power supply's functionality by exposing some of it's components.

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INTRODUCTION

The RadioShack 22-510 Switching Power Supply provides AC to DC conversion to mimic a car’s electrical system. This teardown looks at some of the components that make this supply function.

TOOLS:

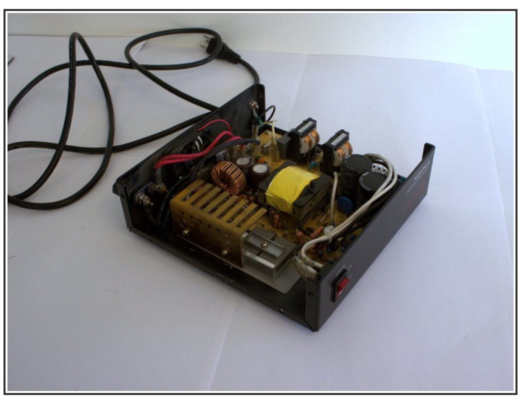
- Phillips #1 Screwdriver (1)
- Adjustable Wrench (1)

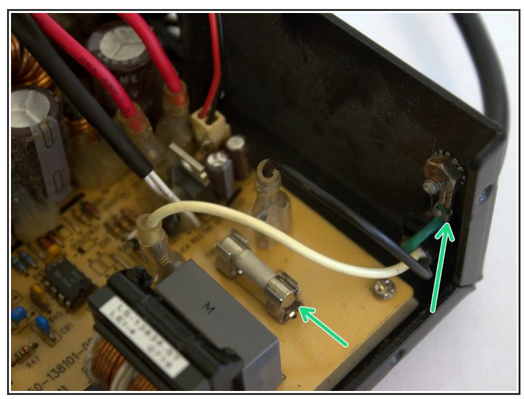
Step 1 — Disconnect Supply Power

Ensure the power supply is unplugged from mains power before continuing. If the device is powered on during disassembly, serious harm or death may occur.

The entire power supply can be taken apart with a Phillips screwdriver and adjustable wrench.

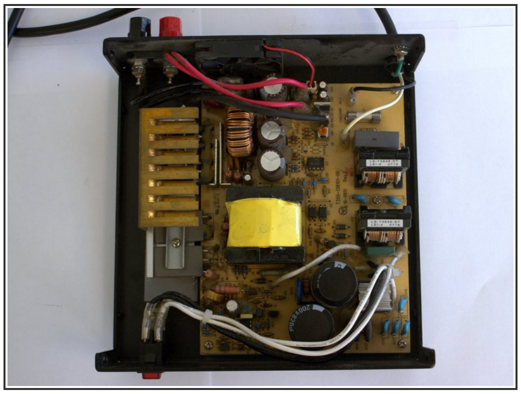
Step 2 — Remove the Cover

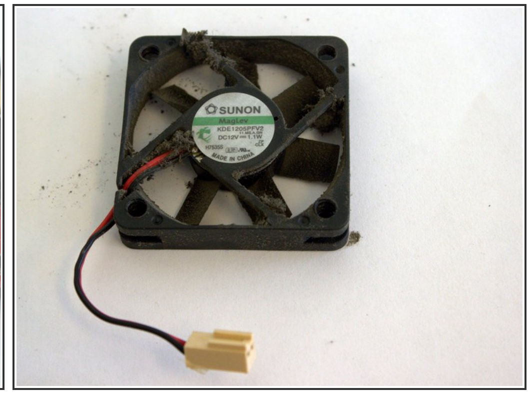




- Removing the eight cover screws on either side of the power supply allows the cover to lift off
  - Screws can be organized using an [iFixit Magnetic Project Mat]
- A fuse protects the system from overcurrent conditions and the chassis is grounded to protect the user from shorts to the case.

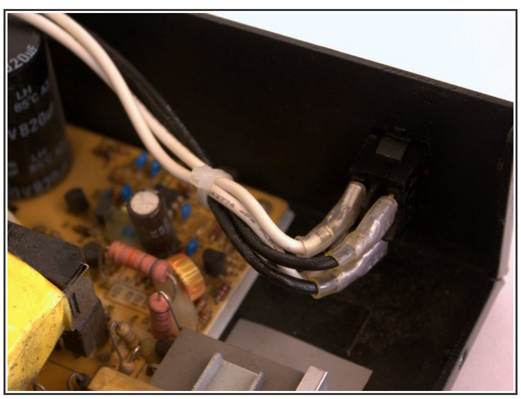
Step 3 — Remove Fan

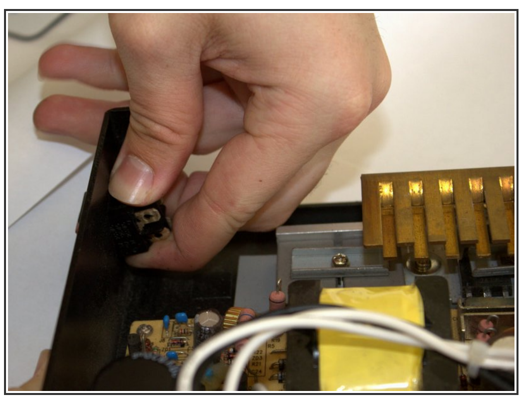


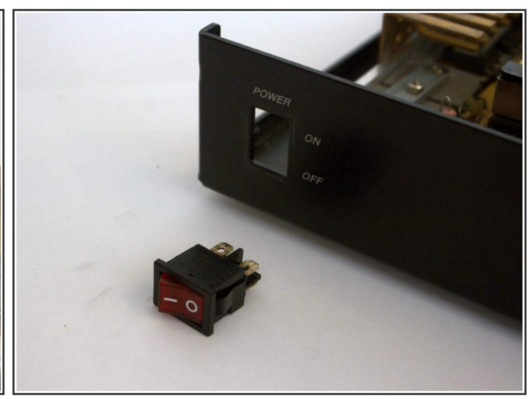


- The fan connector pulls out by hand. The spade terminal connectors may require coaxing with a pair of pliers.
- The [Sunon MagLev KDE1205PFV2] runs at 4300 RPM for a maximum airflow of 13 CFM. A dirty fan might not meet these specifications. Remember to clean your fans!

Step 4 — Remove Switch



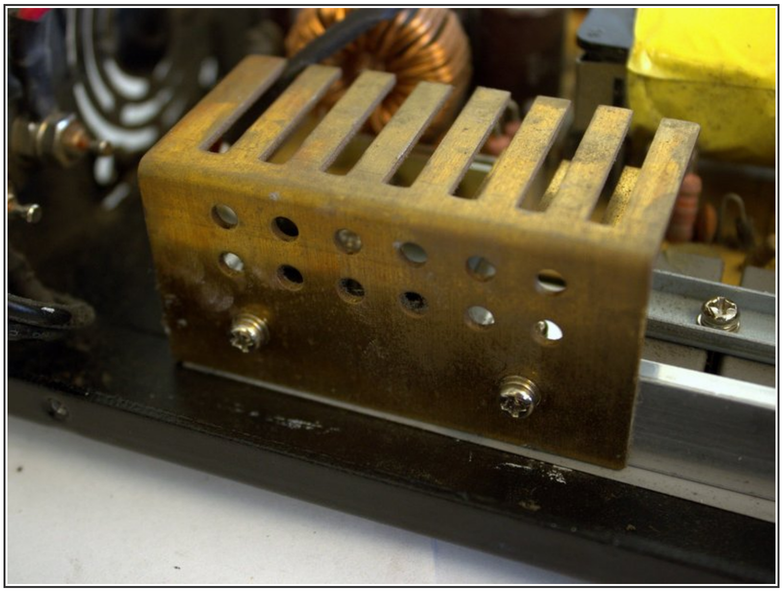


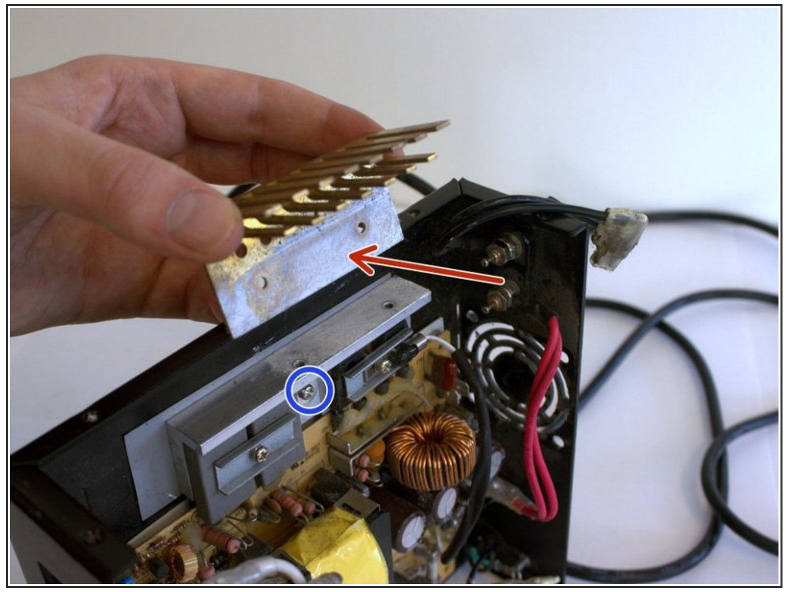


- The illuminated switch is connected by two sets of black and white AC wires and held in by two locking tabs.

  ⚠ The switch is hooked up to the primary side of the circuit. If the switch faults while energized, it has potential to shock the user.

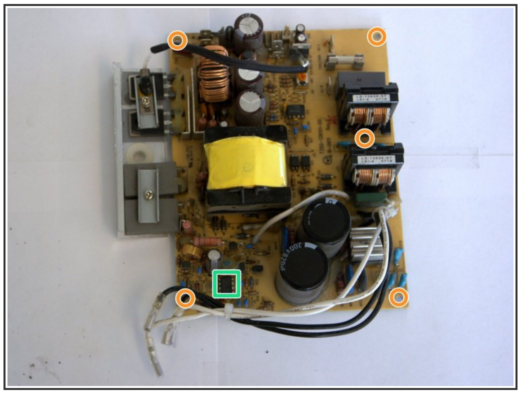
Step 5 — Remove Heatsink and Heat Spreader

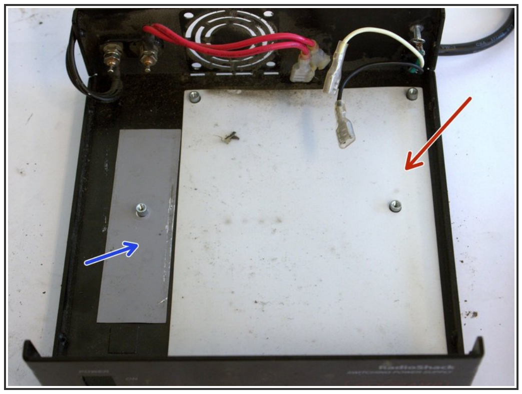


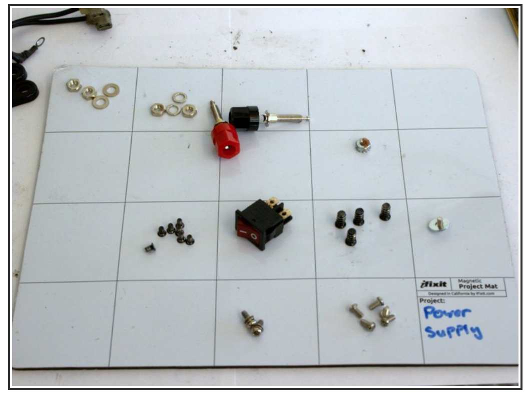


- Removing the heatsink from the spreader reveals the liberal use of thermal paste. Try not to get it on your hands, it's tough to wash off!
- The silver heat spreader is screwed to the chassis and must be detached before removing the board.

Step 6 — Remove the Board From the Chassis







- The board lifts out of the chassis after removing the five screws holding it down.
  - ⚠ The capacitors may still be charged, do not touch the terminals! The capacitors can be discharged by shorting the terminals with an insulated screwdriver.
- The UC3842BN PWM controller handles the switching feedback.
- The chassis has a sheet of plastic for short circuit prevention under the board.
- A thermally conductive pad lies under the heatsink assembly for additional cooling capability.

Organized parts make reassembly a breeze.