

Power Supply Assembly Instructions

Begin by reading the System 300 General Assembly instructions to become familiar with the parts and procedures used in assembly of this kit. It is recommended that you do the following before you proceed:

Find a place where you can work through completion without disturbing your set-up.

Use adequate lighting.

Work on a light colored surface.

Wash your hands before starting. This removes contaminating oils and perspiration and makes assembly more comfortable.

As you proceed, check off each step with a pencil.

- () 1. Preparation: Have the following tools nearby:
 - Pencil tip soldering iron, hot and tinned (solder coated)
 - Solder--use only thin, ROSIN core solder!
 - Small diagonal wire cutters
 - Small wire strippers
 - Small long-nose pliers
 - Regular pliers (nutdrivers are a help)
 - Flat blade screw driver

- () 2. Unpack the parts carefully and place them in a large box or tray so they won't get lost.

- () 3. Familiarize yourself with the parts provided and check them against the parts list. Identify the positive sides of the capacitors and the positive leads on the diode bridge assemblies. Also examine the integrated circuits and identify the three connection points for each: pin 1, pin 2, and the case.

- () 4. Examine the circuit board. Notice that the board has printed circuit foil on only one side. This side of the board will be referred to as the "foil" side. In assembling the 322 you will mount most of the components on the plain other side, which will be referred to as the "component" side. In this way, the component leads will extend through the board and be soldered to the foil. Notice, however, that the heat sink assemblies mount to the foil side of the board.

- () 5. Mount capacitors C1, C3, and C5 onto the component side of the board. Note that C5 is different from C1 and C3, and is mounted between the latter. Also notice the polarity of the capacitors, matching the "+" on the capacitors to those on the board. Capacitor mounting and connections are accomplished by the same screws. Be sure to tighten these screws firmly for good electrical connection as well as solid physical mounting.

- () 6. Using 6-32 screws and nuts, mount the 4-pin socket (J1) on the circuit board in the orientation shown on the layout diagram. The socket surface and the mounting flanges should be on the foil side of the board with the body of the socket inserted into the square hole. This will put the 4 solder tabs on the component side of the board.
- () 7. Using a 6-32 screw and nut, mount the fuse holder (F1) on the component side of the board.
- () 8. Insert the 4 amp fuse into the fuse holder.
- () 9. Using 4 8-32 screws and nuts, mount the power transformer on the board oriented so that the blue, orange and yellow "secondary" wires are on the side of the transformer away from the fuse holder.
- () 10. Insert the ends of the orange pair of transformer wires through the two small holes on the board marked "O" and solder them. It does not matter which orange wire goes to which "O" solder point on the board. The wires may be shortened for better appearance if desired, but leave enough length for moderate slackness.
- () 11. Solder the two blue wires to the points marked "B" in the same way.
- () 12. Similarly, solder the two yellow wires to the points marked "Y".
- () 13. Solder the 3 diode bridges D1, D2, D3, to the board. BE SURE TO OBSERVE PROPER ORIENTATION: The lead marked "+" (on the top of the component) must be soldered to the point marked "+" on the board.
- () 14. Take the end of the power cord without the plug and insert it through the 1/4" hole in the board near J1, so that the plug is on the foil side. Tie an overhand knot in the cord on the component side of the board, 1 1/2" from the end.
- () 15. Separate the two wires of the power cord down to the knot and strip or trim to get 1/4" of bare wire.
- () 16. Solder one of the power cord leads to one end of the fuse holder, as shown on the layout diagram. Clip any excess wire.

- () 17. Solder the other power cord lead to pin 1 of the 4 pin socket J1. This is best done by tightly twisting the bare wires so they will pass through the hole in the solder tab. Pass the wire through the hole and then bend it around the tab. Now solder it.
- () 18. Solder the black "primary" transformer lead to pin 4 of J1.
- () 19. Solder the white "primary" transformer lead to pin 1 of J1. In this case, strip about 3/16" of insulation from the white lead and wrap the wire around the solder tab below the power lead. Solder.
- () 20. Cut a piece of 22 gauge or heavier hookup wire, 2" in length. Strip about 3/16" of insulation off each end. Solder it between the free end of the fuse holder and pin 2 of J1.
- () 21. Solder the three octal sockets, J2, J3, & J4, to the positions indicated on the layout diagram. BE SURE TO ORIENT THEM CORRECTLY: Pins 1 & 2 are +15v, Pins 3 & 4 are -15v, pins 5 & 6 are +5v, and pins 7 & 8 are ground. (In other words, check this very carefully.)
- () 22. Using 8 of the 6-32 X 1/4" screws, mount the hexagonal spacers on the FOIL side of the circuit board. The feet of the heat sink assemblies will later bolt to these spacers.
- () 23. Using 6-32 X 1/2" screws and nuts, install the LM309K and the LM-340-15K integrated circuits onto one of the heat sinks so that the pins protrude on the same side of the heat sink as its feet. The 6-32 nuts should also be on this side. Both of these integrated circuits have their cases at ground potential so no insulation is necessary between the cases and the heat sink. It is necessary to install a solder lug under the nut on one of the mounting screws of each I. C. for the "case" connection.
- () 24. Press a "TO-3" I. C. socket onto each of the I. C.'s. Solder a 22 mfd capacitor between pin 2 of the socket (the positive side of the capacitor) and the solder lug "case" connection. BE SURE THAT THE POSITIVE (+) END OF THE CAPACITOR IS SOLDERED TO PIN 2. Keep the capacitor leads fairly short (about 1/2" to 3/4") so that the capacitor will be close to the heatsink and not touch the circuit board.

- () 25. Mount the LM-320-15K on the other heat sink. In this instance, the case must be electrically insulated from the heat sink so it is necessary to install the thin mica insulator between them. It is also necessary to install insulating fiber shoulder washers between the nuts of the mounting screws and the heat sink in such a way as to ensure that the mounting bolts cannot touch the heat sink. Be sure that the small raised "shoulder" of the washer fits into the hole in the heat sink to keep the screw centered. The solder lug, of course, is installed between the fiber washer and the nut at one end of the integrated circuit.
- () 26. Press the remaining I. C. socket onto the pins of the LM320-15K. This time solder the positive lead of the 22mfd capacitor to PIN 1 of the socket and the negative lead to PIN 2.
- () 27. Using 22 Gauge wire or heavier, connect the solder lugs and 2 pins of each I. C. socket to the correct points on the circuit board as shown on the layout drawing. The wires should pass through the 1/4" holes in the board as shown, then the end of the wire should be stripped and pushed back through the board and soldered on the foil side.
- () 28. Fold the excess wire and bolt the heat sinks to the outer ends of the hexagonal spacers already installed using the remaining 6-32 X 1/4" screws.

This completes the assembly of the power supply.

The supply should be tested before being connected to other modules. This can be done with a voltmeter at the voltage test points indicated near the output connectors. It will be necessary to make a temporary connection between pins 2 and 4 of the connector J1 to represent the power switch which is part of the AR326 module.

CAUTION: remember that pins 2 and 4 may have 110v on them....

The power supply is normally operated on its side with the fins of the heat sink vertical for best air convection and cooling effect.

The power supply is mounted to the floor of the AR310 main cabinet using the remaining 6-32 screws and nuts, the angle brackets, and the #4 X 1/2" woodscrews. (Refer to the AR310 Cabinet drawing.) The heatsinks should be toward the rear of the cabinet. The circuit should be 1 7/8" in from the recess in the back edge of the floor of the cabinet. The transformer end of the circuit board should be 3" from the inside of the end of the cabinet.