LPU Kit Building Notes
Rev 3.0 - 21 April 2009

Note that the following parts are NOT supplied with the kit, as they are not needed to power HPSDR:

3.3V regulator components:

- C1, C3 (10uF ceramic)
- C2, C4 (100nF ceramic)
- C22 (100uF tantalum)
- F1 (2A PTC fuse)
- HS1 (heatsink)
- R4 (2.2 Ohm, 10W)
- U1 (regulator IC)
- X21 (4-40 x 3/8" screw)
- X24 (4-40 nut)

The following are optional components, and are not supplied:

Internal powerpole connectors:

- H6, H8 (red powerpole housings)
- H7, H9 (black powerpole housings)
- J6, J7, J8, J9 (vertical powerpole pins)

Series dropping resistor bypass:

- R5, R7 (0 Ohm)

The part numbers for these parts are on the BOM. Please consult the schematic and BOM to determine the suitability of these parts for your application. All of these parts may be added after the standard kit has been completed, if desired.

The following items not included in the kit and are REQUIRED in order to complete kit assembly:

- approximately 15 inches (38cm) of 18-24 awg (19-25 swg) uninsulated bus wire
- two small dabs of thermal compound, one for each regulator (U2, U3)

The following is a suggested order of part installation.

1. Mount polarized SMT components in any order (note orientation!):
   - € C11, C20, C21 (47uF tantalum)
   - € C23 (100uF tantalum)
   - € D1 (MBR0520L diode)
   - € U4 (LT1931AES5)

2. Mount remaining SMT components in any order (orientation is not important):
   - € C5, C7, C9, C13, C18 (10uF ceramic)
   - € C6, C8, C10, C12, C14, C16, C19 (100nF ceramic)
   - € C15 (1uF ceramic)
   - € C17 (68pf ceramic)
   - € F2, F3 (2A PTC fuse)
   - € F4 (1A PTC fuse)
   - € L1, L2 (3.3uH)
   - € R1, R3 (10K)
   - € R2 (84.5K)

3. Mount through-hole jumper and fan connector:
   - € JP1 (2-pin header)
   - € J10 (3-pin locking header) Note polarity: locking tab goes nearest PCB edge

4. Assemble powerpoles:
   - € Lock each red housing (H2, H4) to a black housing (H3, H5) by sliding the red housing into the groove on the black housing.
   - € Lock the two red/black pairs together in the same manner, forming a block of four.
   - € Looking into the front (contact end), the two black housings will be on the left and the two red housings will be on the right.
   - € From the back end, slide in the short right-angle pins (J2, J3) into the bottom (nearest PCB) row of housings until they click.
   - € From the back end, slide in the long right-angle pins (J4, J5) into the top (farthest from PCB) row of housings until they click.
   - € Mount this on the PCB so that the pins from the red powerpoles fit into J2/J4 and the pins from the black powerpoles fit into J3/J5.
   - € Fit the staple (ST1) over the top of the housings, pull tight to the PCB and solder.
   - € Solder pins at J2, J3, J4, J5.

5. Assemble regulators and heatsinks:
   - € Attach regulators (U2, U3) to heatsinks (HS2, HS3) using screws (X22, X23) and nuts (X25, X26). Use thermal compound (not supplied), but do not tighten screws.
   - € Mount U2 assembly to board at location U2 and solder regulator pins to PCB. Make sure heatsink is tight to PCB before soldering.
   - € Mount U3 assembly to board at location U3 and solder regulator pins to PCB. Make sure heatsink is tight to PCB before soldering.
   - € make sure regulators (U2 and U3) are vertical and tighten screws (X22, X23).
   - € Solder regulator (U2 and U3) pins to PCB.

6. Assemble ATX power connector:
   - € Crimp a 3/4" (19mm) piece of 18-24 ga bus wire (not supplied) into each ATX socket (X1 - X20). Use Molex crimper 63811-5000 or equivalent. Soldering the sockets to the wire is highly recommended to prevent intermittent problems.
   - € Slide each socket assembly (with attached wire) into a position in the ATX connector housing (J1). Observe proper orientation.
   - € All 20 sockets can be inserted, but only 16 are used: 1, 2, 3, 5, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 20.
   - € Orient the connector with pin 1 nearest the silkscreen mark "J1". The connector mounts on the back side of the PCB (opposite side from the heatsinks).
   - € Make sure that the connector housing (J1) is down tight against the PCB, and solder all connections. The connector latch faces away from the PCB edge.

7. Mount dropping resistor (Note: you must solder all J1 pins BEFORE you mount R6):
   - € R6 (2.2 Ohm, 10W)
   - € Leave an air gap between R6 and the PCB to help with cooling.

8. Install jumper (X27) at JP1 to disable the negative switching regulator if -12V is not needed. This will reduce system noise.

Be sure to test LPU by measuring output voltages on Atlas <u>BEFORE YOU PLUG IN YOUR EXPENSIVE HPSDR BOARDS</u>!