

# DENTRON CLIPPERTON-L POWER SUPPLY MODULE v5.3 ASSEMBLY & INSTALLATION INSTRUCTIONS

**WARNING: This upgrade is not for the faint of heart or inexperienced in amplifier theory and repairs as the voltages inside the amplifier CAN and WILL KILL YOU! Different models of the Clipperton-L amplifier used different wiring colors and parts layouts. You MUST be able to read your schematic and understand the design, theory and wiring of your amplifier to properly perform this upgrade.**

## PM-CL IPL POWER SUPPLY MODULE ASSEMBLY

- (\_) **Read, re-read and fully understand these instructions prior to beginning this upgrade.** Make sure to perform the steps in the order they are listed. Also, be sure to label wires as they are disconnected from various points inside the amplifier. This will help when the time comes to re-attach the wires that will be disconnected during installation of the kit.
- (\_) Go through the Bill of Materials (BOM) and compare that list with the parts in the kit to make sure all parts are present. If you are missing any parts, please contact Harbach Electronics, LLC.
- (\_) Assemble the PM-CL IPL per the parts layout diagram and silkscreen on the PC board. A suggested assembly sequence is resistors R20-R22, then diodes D1 & D3-D14 (**pay attention to polarity!**), followed by resistors R12-R19, R23 and R24, then electrolytic capacitor C41 (**pay attention to polarity!**) and finally electrolytic capacitors C32-C39 (**pay attention to polarity, the square solder pad or a pad marked with a “+” is for the positive terminal of the capacitor!**). **NOTE: Resistors R12-R19 MUST be spaced approximately ¼” above the PC board for proper heat dissipation. Use any kind of spacer you have, but make sure the resistors are above the board!**

## PM-CL IPL POWER SUPPLY MODULE INSTALLATION

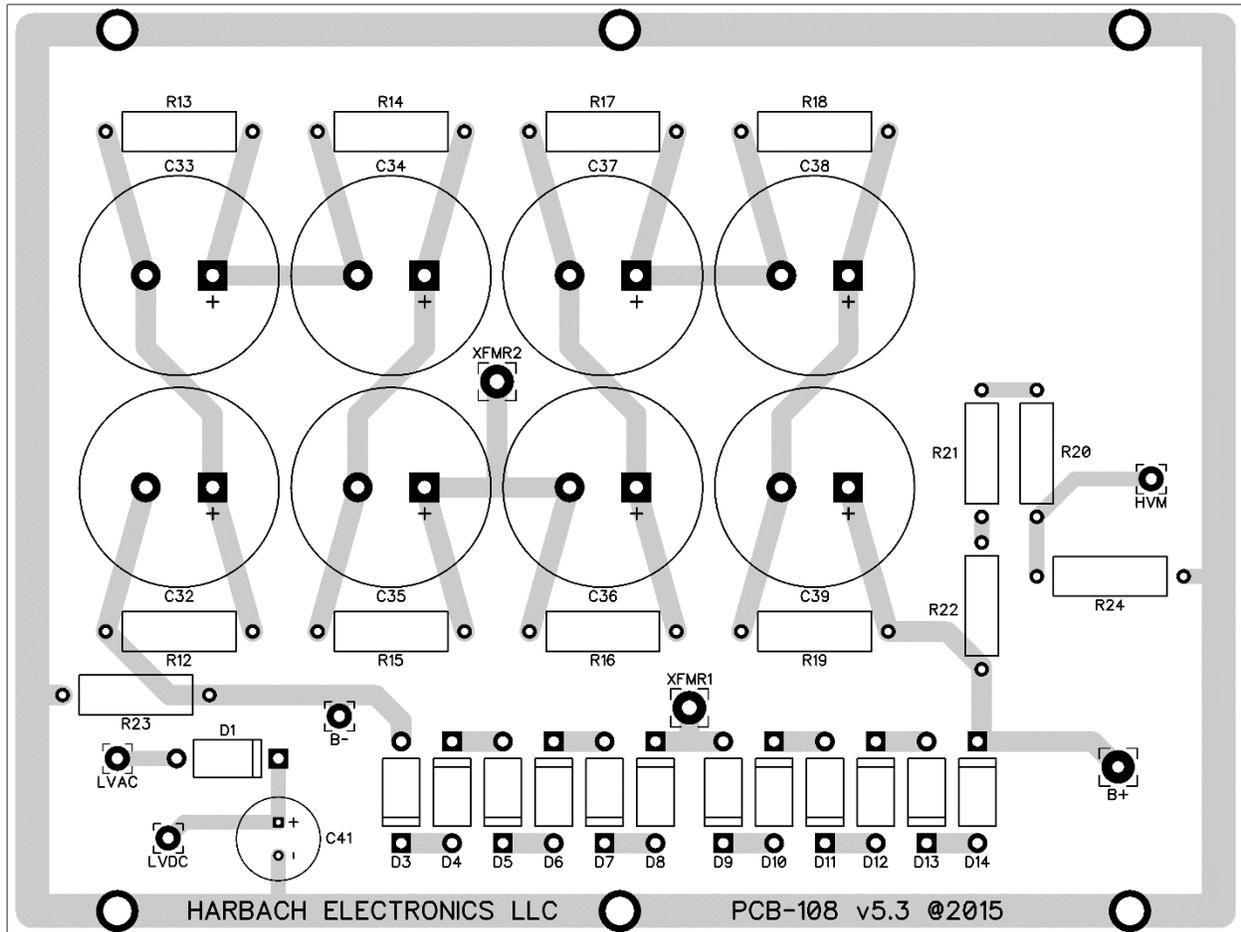
- (\_) Unplug the amplifier power cord from the AC mains and let any high voltage stored in the electrolytic capacitors bleed down. Verify the HV has bled down as shown on the HV meter. Remove both the top and bottom covers. Be sure to use a shorting bar to short or clip the HV to ground to make sure the HV is bled completely off. You are now ready to proceed with the installation of the new power supply module.
- (\_) Locate the HV meter resistor divider string. It is a series string of 3-1M $\Omega$  resistors followed by a 100K $\Omega$  3W resistor to ground. On some models of amplifier, it is located on a terminal strip mounted to the chassis center divider near the front of the amplifier. On other models, these resistors are mounted to the right and above the power transformer on a PC board to which the tube sockets, filament choke and other parts are also mounted.
- (\_) There will be two wires going to the divider string, one carries the plate voltage (B+) to the divider string (connects from the old PC board to the first of the 3-1M $\Omega$  resistors (**usually BLACK or RED**)) and the other carries the low voltage from the divider to the meter switch (connects from the junction of the last of the 3-1M $\Omega$  3W resistors and the 100K $\Omega$  3W resistor to the meter switch (**usually BLACK or WHITE**)).

- (\_) Unsolder or clip (flush) both wires from where they connect to the divider string. Label the wire that goes from the divider string back to the meter switch **HVMETER** (no matter what color it is). It will be connected to the new power supply PC board later. Follow the other wire from the divider string back to the old PC board and clip (flush) or unsolder the wire and discard. It is no longer needed.
- (\_) Remove the old divider string by removing the terminal strip (along with all the resistors) and discarding it or by clipping or unsoldering the 3-1M $\Omega$  3W and 1-100K $\Omega$  3W resistors on the vertical PC board, depending on your model amplifier.
- (\_) Turn the amplifier over so you have access to the bottom side of the old PC board.
- (\_) Unsolder or clip (flush) and label the following wires from the bottom of the old PC board:
  1. The wire that carries plate voltage (B+) from the PC board to the plate choke (**usually RED or YELLOW**). Label this wire **HVB+**.
  2. The large **ORANGE or RED** wire from the transformer (almost always spliced to a different color, *usually RED or DARK GREEN*). Label this wire **XFMR1**.
  3. The large **BROWN or ORANGE** wire from the transformer (almost always spliced to a different color, **usually LIGHT GREEN**). Label this wire **LVAC**. NOTE: The other **BROWN or ORANGE** wire from the transformer is connected to a solder lug on one of the PC board mounting screws.
- (\_) Turn the amplifier back over so you have access to the top side of the old PC board.
- (\_) Unsolder and label the 2 large wires (**usually RED and BLUE or RED/BLUE and RED/YELLOW**) from the top of the CW/SSB switch wafer. Be sure to label and mark the wires and switch wafer lugs, as they will be re-attached later.
- (\_) Unsolder or clip (flush) and label the following wires from the top of the old PC board:
  1. The small wire (**usually GRAY**) from the meter function switch to the B- side of a 0.05 $\Omega$  resistor mounted on the top or bottom of the old PC board (depending on your model amplifier). Label this wire **B-**.
  2. The single wire from the bottom of the CW/SSB switch wafer to one of the middle filter capacitors (**usually RED or YELLOW**). Label this wire **XFMR2**. If you are not able to reach in and clip the wire, unsolder the other end from the switch wafer and then clip the wire from the PC board after it is removed from the chassis. Save this wire, as it will be re-attached later.
  3. The small wire (**usually WHITE w/ BLUE STRIPE or GREEN**) from the normally-open (NO) contact of the STANDBY switch to the old PC board. Label this wire **LVDC**.
- (\_) There may or may not be one last wire connected to the top of the old PC board depending on your model amplifier. In some models, the POWER light is illuminated with low-voltage AC (usually a small **GREEN** wire connected from one terminal of the POWER light to the PC board) and on other models the POWER light was illuminated with 12VDC from the 12VDC relay supply on the PC board (usually a small **GREEN** wire connected from one terminal of the light to the 12VDC supply). Clip the wire flush with the PC board and label the wire **PWRLITE**.

- (\_) Remove the six mounting screws and nuts attaching the PC board to the chassis and remove the old PC board. Save the mounting hardware. Leave the solder lug that is soldered to the board, as it is no longer needed. **It may take some persuasion, but it will come out. Based on your model of Clipperton-L, you may have to remove the tubes, loosen the eight (8) mounting nuts, unsolder the filament wires and move the vertically-mounted PC board out of the way.**
- (\_) Re-route the free end of the small **GREEN** wire labeled **PWRLITE** to the NO side of the STANDBY switch and solder. This converts the POWER light to operate on DC voltage.
- (\_) Install the new assembled power module using the same mounting hardware you saved when you removed the old PC board. **Again, it may take some persuasion, but the new power supply PC board will fit.** Make sure to re-attach the ground lug that is soldered to the **BROWN** wire from the transformer. If you had to move the vertically-mounted PC board to remove the old board and install the new PC board, re-install the board and any connections you unsoldered.
- (\_) Solder the following wires (as labeled from the previous steps) to the corresponding labeled pads on the new power supply PC board or switch lugs. Strip approximately ¼” of insulation from the free end of each wire and tin as needed. NOTE: Some wires will come from above the PC board and some will come from the below, but all wires will be soldered to switch lugs or on the bottom side of the PC board:
  1. The small wire labeled **B-** (usually **GRAY**) from the meter function switch to pad labeled **B-** on the new power supply PC board.
  2. The single wire labeled **XFMR2** from the bottom of the CW/SSB switch wafer to the pad labeled **XFMR2**. If you previously unsoldered one end from the bottom of the CW/SSB switch wafer, re-attach the free end of the wire to the appropriate wafer lug and solder.
  3. The small wire labeled **LVDC** from the normally-open (NO) contact of the STANDBY switch to the pad labeled **LVDC** on the new power supply PC board.
  4. The small wire labeled **HVMETER** from the meter function switch to the pad labeled **HVMETER** on the new power supply PC board.
  5. The 2 large wires (**usually RED and BLUE or RED/BLUE and RED/YELLOW**) from the power transformer that were unsoldered from the top of the CW/SSB switch wafer earlier. Be sure re-connect and solder them to the appropriate lugs of the CW/SSB switch wafer. **NOTE: These wires are usually enamel-coated and the enamel must be removed and the wires tinned prior to soldering to the appropriate CW/SSB switch wafer lugs.**
  6. The wire labeled **HVB+** that carries plate voltage (B+) to the tube compartment to the pad labeled **HVB+** on the new power supply PC board.
  7. The large **ORANGE or RED** wire from the transformer labeled **XFMR1** to the pad labeled **XFMR1** on the new power supply PC board.
  8. The large **BROWN or ORANGE** wire from the transformer labeled **LVAC** to the pad labeled **LVAC** on the new power supply PC board.
- (\_) **Review and recheck your wiring and soldering at this point!!!**
- (\_) Re-insert the tubes into their sockets; re-attach the plate clips to the tubes, if required.
- (\_) Replace the top and bottom covers of the amplifier.

This completes the installation of the PM-CL IPL replacement power supply module. It will provide you with additional years of reliable service from your Clipperton-L HF amplifier.

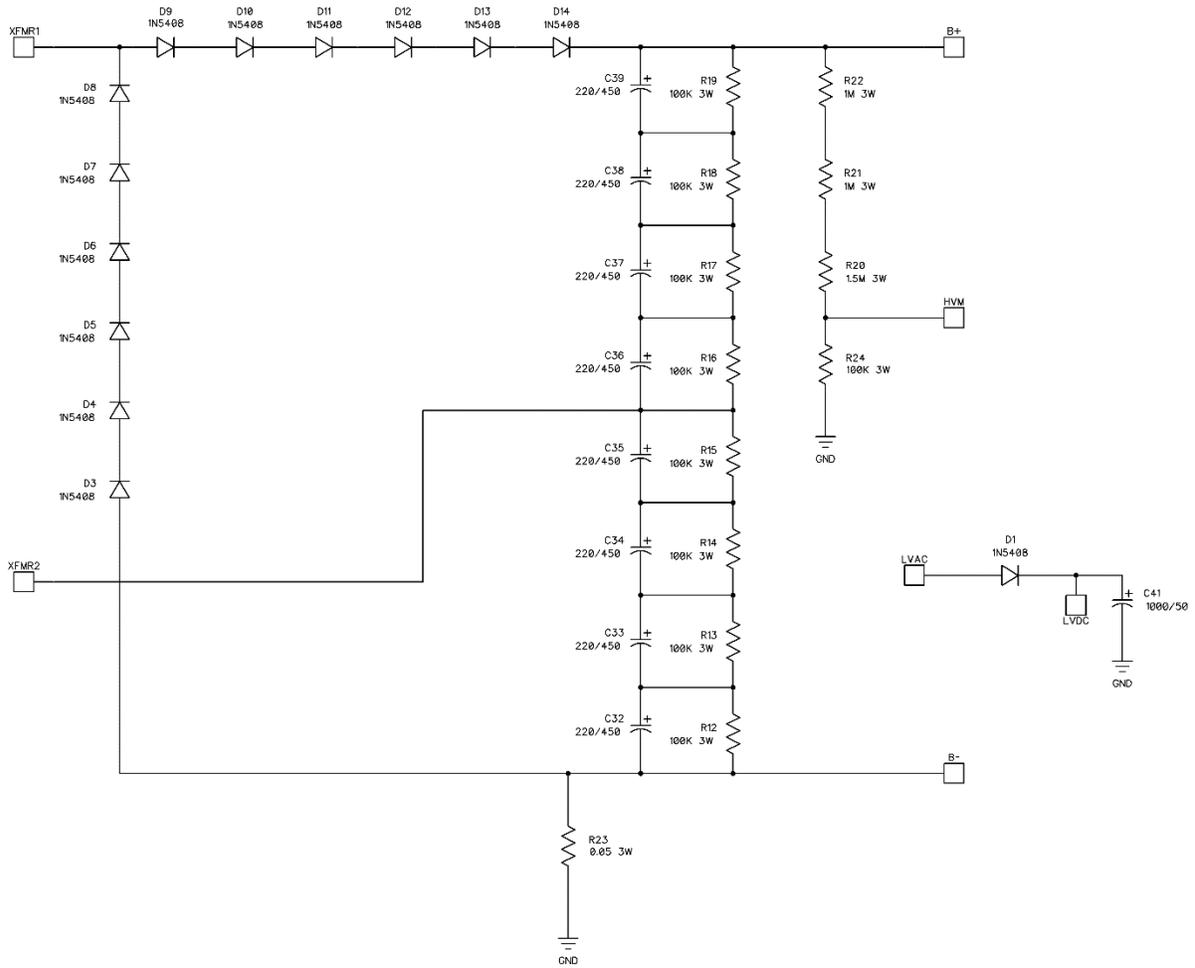
## PM-CL IPL POWER SUPPLY MODULE PCB PARTS LAYOUT (PCB-108)



### PM-CL IPL BILL OF MATERIALS (BOM)

Verification	Part Number	Quantity	Description	Designation
[ ]	PCB-108	1	PM-CL IPL Power Supply PCB v5.3	N/A
[ ]	CAP-110	1	1000 $\mu$ F 50VDC Electrolytic Capacitor	C41
[ ]	CAP-111	8	220 $\mu$ F 450VDC Electrolytic Capacitor	C32-C39
[ ]	DIO-102	13	3A 1000 PIV Diode (1N5408)	D1, D3-D14
[ ]	RES-301	1	0.05 $\Omega$ 3W Resistor	R23
[ ]	RES-302	3	1M $\Omega$ 1W HV Resistor	R20-R22
[ ]	RES-401	9	100K $\Omega$ 3W Resistor	R12-R19, R24

## PM-CL IPL POWER SUPPLY MODULE SCHEMATIC (PCB-108)



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