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# Audio Grade DC Power Supply, 500W

## Model XAPS-500W

### Assembly Instruction Manual

Rev 1.0

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Xkitz.com

#### **Features**

- Unregulated DC power supply - optimized for audio amplifier applications
- Output voltage: Max 50V, Determined by transformer secondary voltage
- Output Current: Max 25 Amps Sustained
- Large filter caps totaling over 18,000uF for clean, solid, output
- Massive PCB traces for heavy power handling capability
- Dimensions: 3.875" x 2.5" x 2.5" High (98mm x 64mm x 64mm)

## **Unpacking Your Kit**

Carefully unpack and take stock of the components in your kit. The electronic components are packed in 1 bag labeled 'Bag A'. See Table 1 for a complete listing of your components.

## **Assembly Instructions**

It is very important that you read and understand all of the following instructions before you start your assembly so that you don't make any mistakes that might be difficult to recover from. The assembly should be done in the order listed in Table 1 or you may have difficulty physically accessing components for soldering.

## **What you'll need**

- Soldering iron with small or medium tip
- Damp sponge for tip cleaning
- Solder
- Solder wick or solder sucker in case of solder bridging (stranded wire could substitute)
- Small needle nose pliers.
- Small wire cutters
- Small straight screwdriver
- Magnifying glass to read the markings on the tiny components

## **General Assembly Guidelines**

- **Take your time!!** Most mistakes are made when rushing through the assembly. Taking the time to double check every step will pay off with a first-time functional device.
- In cases where it is necessary to re-form the leads on components (such as resistors and diodes), be very careful not to put stress where the lead enters the component itself. The physical attachment of the lead to the component can sometimes be very fragile and the lead may break off if too much force is applied. Reforming the leads can be done by gripping the lead with small needle-nose pliers at the base of the component while bending the lead on the other side of the pliers.
- Use as little heat and solder as necessary to affix the components to the PCB (printed circuit board). Many of the parts in this kit are temperature sensitive. Overheating may damage them.
- Always clean the soldering iron tip on the damp sponge prior to every solder joint. Re-tin whenever the tip gets a little dull. (tinning is the application of fresh solder to the tip of the iron until its shiny, wipe excess on a damp sponge).
- Inspect the solder joints. They should be shiny and smoothly connect the pad to the lead. A dull looking joint may indicate it is 'cold', meaning that either the pad or the lead weren't heated enough to allow reliable connection. This could lead to erratic operation of the device. Re-flow the joint again with the soldering iron, apply equal heat to both the pad and the lead, apply a little more solder if needed to get a good shiny connection.
- When clipping the excess leads of the through-hole parts, don't try to clip too close to the PCB. Clip just above the solder joint to avoid fracturing the solder joint, which could lead to device failure sometime in the future.
- Carefully inspect each solder joint to make sure you didn't accidentally form a 'solder bridge', or connect two adjacent pads together. Remove solder bridges by using solder wick or a solder sucker. If the bridge is small you may be able to remove it by just reheating the joint and sliding the soldering iron across the bridge. If not, see the next step.
- If you need to remove solder from a hole (or a solder bridge) and you don't have solder wick or a solder sucker, you can use stripped stranded wire in place of solder wick. Place the stranded wire across the hole and touch the soldering iron to the wire, above the hole. As the wire heats it will melt the solder in the hole, and the melted solder will tend to wick up into the stranded wire. When the wire fills up with solder, move a clean part of the wire over the hole and repeat until the hole is clear of solder.

## Circuit Board Assembly

You're ready to begin assembling your XAPS-500W circuit board. Assemble the board in the order listed in Table 1. Use the install check boxes on the right side to track your progress. The 'Install Notes' column will alert you to any special instructions (listed below) for each of the components.

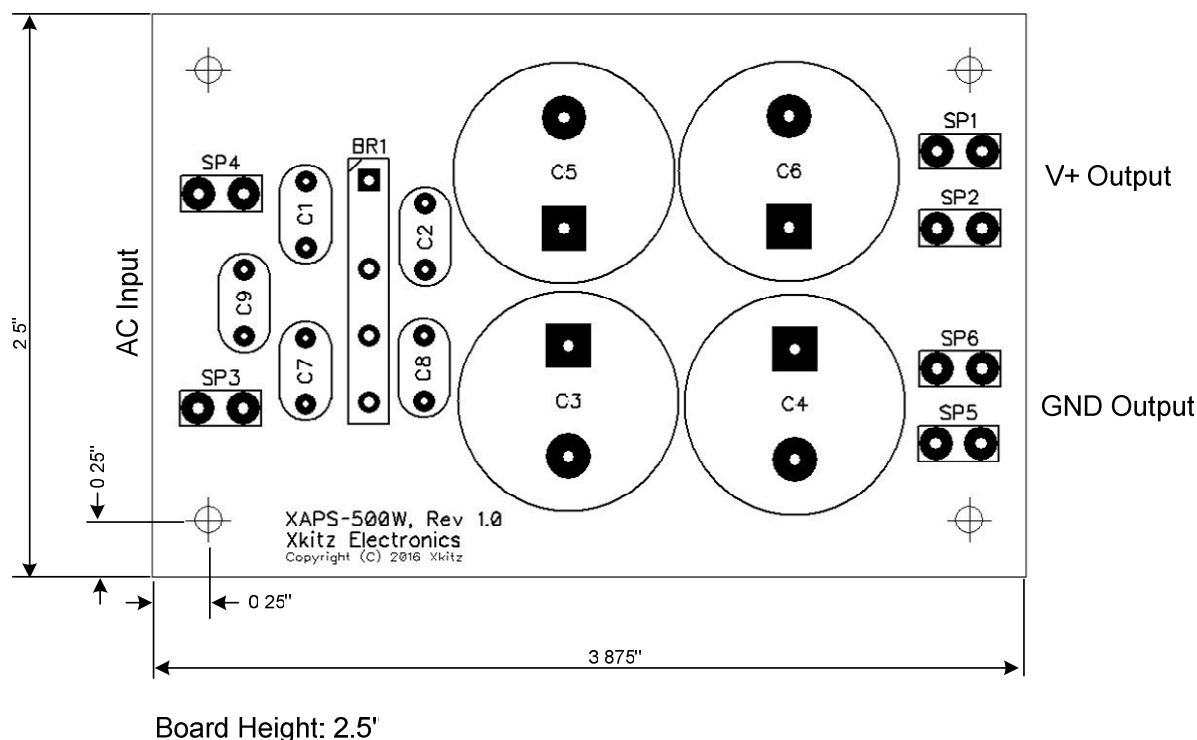
**Table 1. Circuit Board Parts List (Bag A and Bag B)**

Pack √	Device	Value	Marking	Qty	Reference Designators	Install Notes	Install √
	CIRCUIT BOARD (PCB)	REV 1.0	XAPS-500W	1			
	CAPACITOR	.01uF, 250V	103	1	C9		
	CAPACITOR	.1uF, 250V	104	4	C1,C2,C7, C8		
	SPADE TERMINALS			6	SP1,SP2, SP3,SP4, SP5,SP6		
	BRIDGE RECTIFIER		GSIB 2560	1	BR1	1	
	ELECTROLYTIC CAPACITOR	4700uF	4700uF	4	C3,C4,C5, C6	2	

### Circuit Board Component Installation Notes:

1. The bridge rectifier is polarized, but the pin 1 is offset, so it can only be inserted one way.
2. The electrolytic capacitors are polarized devices, be sure to install them the right way around. The positive lead is longer than the negative lead. The positive lead goes in the square pad hole on the PCB. Note that the polarity is also marked on the outer casing of the caps.

**Figure 1. PCB Parts Placement and Dimensions**



## **Transformer Selection**

You should select a transformer with a secondary voltage of approximately equal to your desired final unregulated DC output voltage multiplied by 0.77 (e.g. for approximately 24V DC output, use a transformer with a secondary voltage around 18.5V). It should have a current rating capable of driving your expected worst case DC load. Table 2 below gives sample part numbers for toroid power transformers made by Hammond Manufacturing for some common voltage and current ratings. These can be purchased from most parts distributors such as Mouser Electronics. The listed transformers are dual secondary, and the secondary's should be wired in parallel to obtain the listed voltage and current.

**Table 2. Sample Transformers, Part Numbers for Hammond Mfg Power Transformers**

Secondary AC volts	Unregulated DC Volts Out	DC Output Current				
		2.5 Amps	4 Amps	6.7 Amps	7.5 Amps	10 Amps
12	15.6	1182K12	1182L12	1182M12		1182P12
15	19.5	1182K15	1182M15		1182N15	1182P15
18	23.4	1182J18	1182L18	1182M18	1182N18	1182G18
22	28.6	1182J22	1182L22		1182N22	1182P22
30	39.0	1182K30	1182L30		1182F30	1182P30

Figure 2. XAPS-500W Schematic

