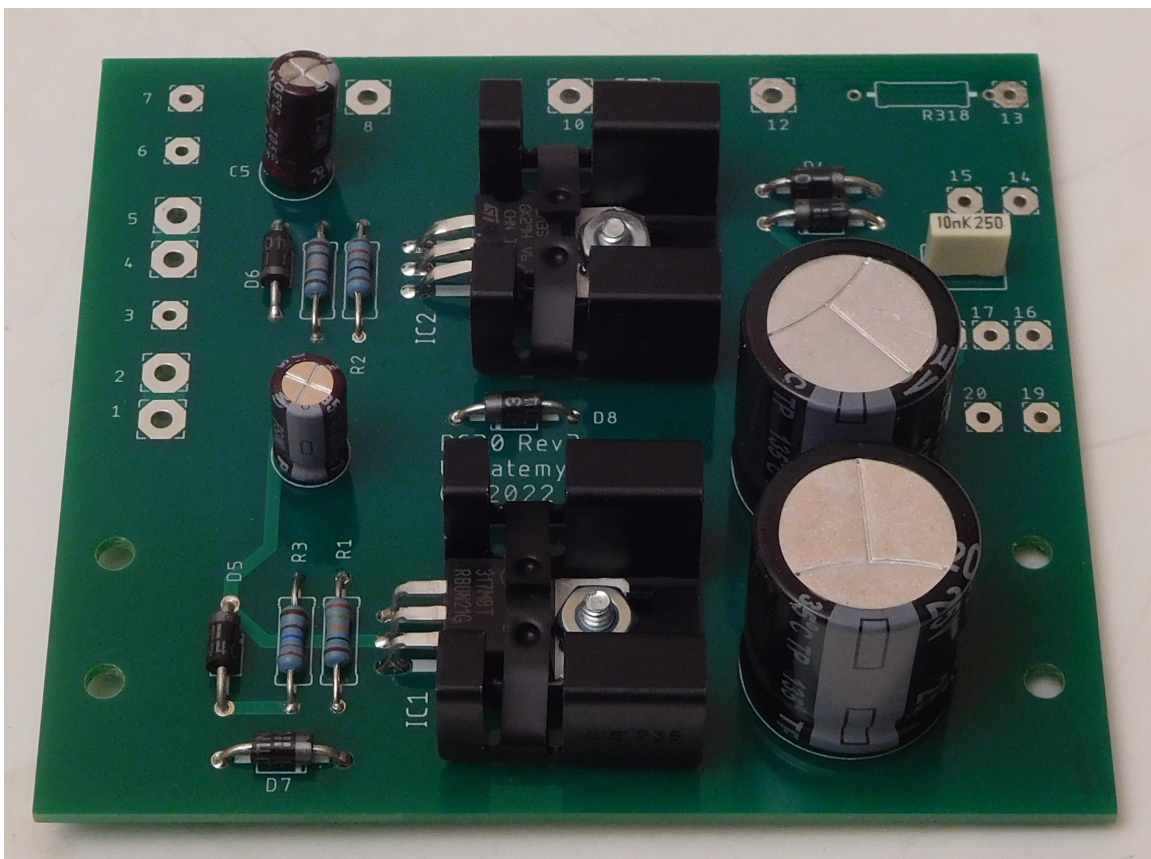


# ***STEREO 400/416/410 PC30 REPLACEMENT***



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## Table of Contents

Table of Contents .....	2
Table of Figures .....	2
Section 1: About This Manual .....	3
Who Should Attempt this Project? .....	3
Tools You'll Need.....	3
Project Overview .....	3
Important Safety Notes .....	3
About Components .....	4
Recommended Solder .....	4
Warranty .....	4
Section 2: Building the PC30 Board.....	5
Resistor Installation .....	6
Diode Installation.....	6
Regulator Installation.....	6
Capacitor Installation.....	8
Removing the Old PC30.....	8
Installing the new PC30.....	11

## Table of Figures

Figure 1-PCB for the PC30 Replacement Board.....	5
Figure 2-PC-30 connections .....	9
Figure 3-PC30 replacement schematic .....	10

## Section 1: About This Manual

This manual gives the information you need to build and install a replacement PC-30 in a Dynaco Stereo 400/410/416 Power amplifier.

### ***Who Should Attempt this Project?***

***Warning: The Stereo 400/410/416 is a heavy, awkward beast to work on. It has high voltages and large capacitors that store a lot of energy. If you're a beginner, don't install this kit.***

### ***Tools You'll Need***

You'll need the following tools:

1. flat blade screwdriver for #6 screws
2. needle nose pliers (helpful, but not strictly necessary)
3. pencil type soldering iron of 25 to 50 Watts (no huge honking soldering guns or blowtorches)
4. wire cutters and strippers
5. Magnifying glass, if you're over 42!

### ***Project Overview***

The project consists of the following steps:

1. Building the new PC30 Board.
2. Removing the original PC30 Board.
3. Installing the new PC30 Board.

### ***Important Safety Notes***

By purchasing, using, or assembling this kit, you have agreed to hold Akitika, LLC harmless for any injuries you may receive in its assembly and/or use. To prevent injuries:

- Wear safety glasses when soldering to prevent eye injuries.
- Always unplug the power before working on the amplifier.
- Large capacitors hold lots of energy for a long time. Before you put your hands into the amplifier:
  - Pull the AC plug!
  - Wait 1 full minute for the capacitors to discharge!
- Remove jewelry, rings, and watches from your hands and wrists, or anything that might dangle into the amplifier.
- If working in the amplifier, keep one hand in your pocket, especially if you're near the power supply or power supply wires. This can prevent serious shocks.
- Build with a buddy nearby. If you've ignored all the previous advice, they can dial 911 or get you to the hospital.

## **About Components**

We reserve the right to make design and/or component changes at any time without prior notification.
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### **Recommended Solder**

The kit must be assembled with 63/37 (tin/lead) Rosin Core solder<sup>1</sup>. The recommended diameter is 0.031 inches. Kester p/n 24-6337-8800 solder is a very good choice.

### **Warranty**

With the exception of fuses, Akitika will replace for free any component of a correctly assembled PC-30 replacement that fails within one year of the date of purchase when it has been used in home stereo applications. It is the responsibility of the kit builder to install the replacement part(s). This warranty applies to the original purchaser only. It does not apply to units that have been physically or electrically abused, modified without prior factory authorization, or assembled with other than 63/37 Rosin Core solder. Akitika LLC's liability shall in no event exceed the cost paid to Akitika LLC for the kit.

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<sup>1</sup> [https://en.wikibooks.org/wiki/Practical\\_Electronics/Soldering](https://en.wikibooks.org/wiki/Practical_Electronics/Soldering) has entries for both 60/40 and 63/37 solder blends. This reference calls out a preference for 63/37 because it is a eutectic solder, which it says is less prone to cold solder joints.

## Section 2: Building the PC30 Board

This section details the process of building the PC30 board. Warm up your soldering iron and clean the tip. The soldering you're about to do will be much easier if your iron is tuned up and ready.

Find the PCB as shown in Figure 1.

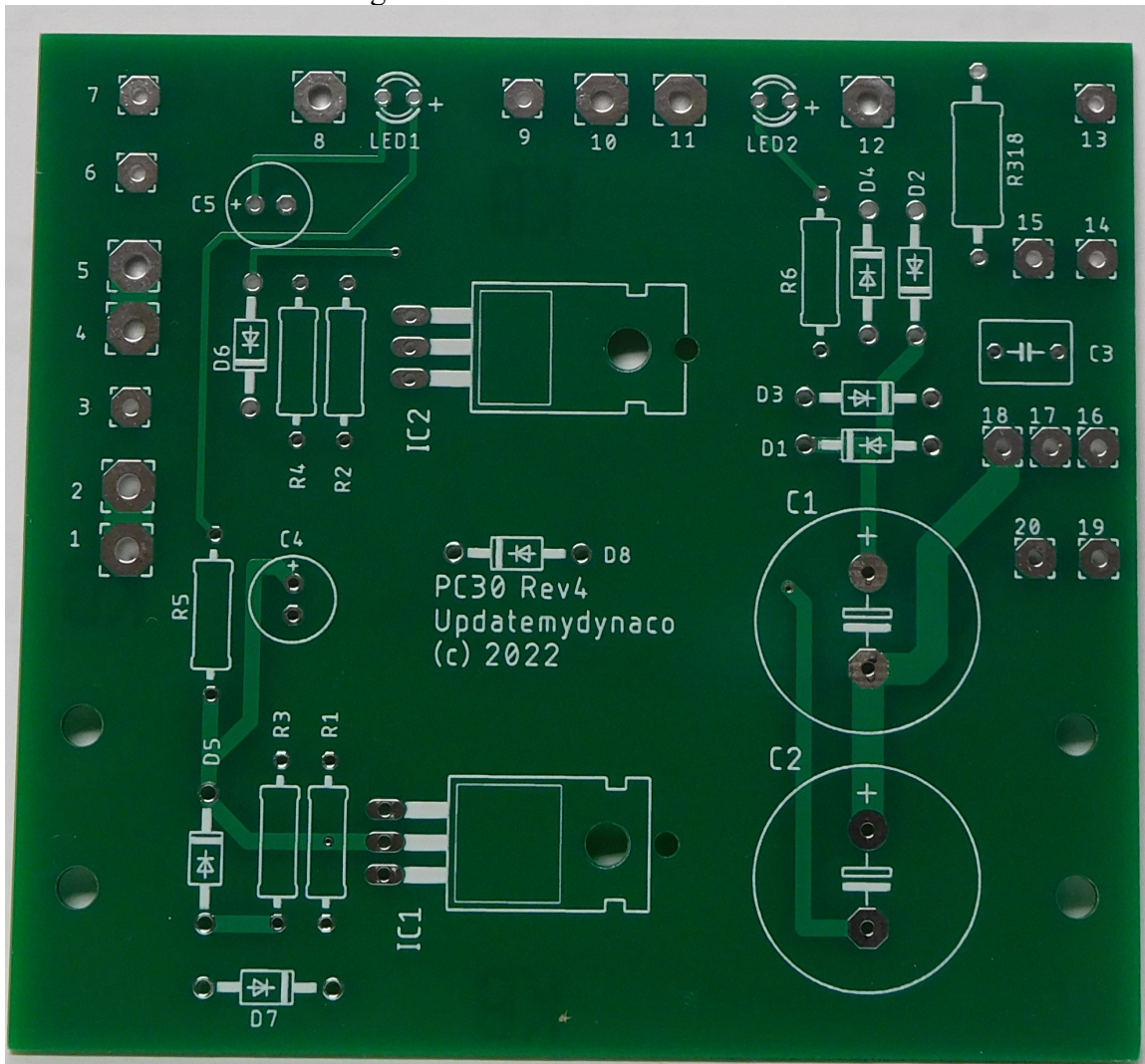


Figure 1-PCB for the PC30 Replacement Board

We'll start with the components that sit closest to the PCB, the resistors. Then we'll move on to the diodes. Finally, we'll install the IC's and capacitors.

## **Resistor Installation**

These resistors are all ¼ Watt, 1%, metal film resistors. Install these resistors into the silk-screen side of the PCB, flush with the PCB. A 1 Watt power resistor will be installed in a later section of this manual.

Lead spacing is 0.5"			
Desig	Value	Color Code	Done ✓
R1	243	Red, Yellow, Orange, Black, Brown	
R2	121	Brown, Red, Brown, Black, Brown	
R3	2260	Red, Red, Blue, Brown, Brown	
R4	1130	Brown, Brown, Orange, Brown, Brown	
R5	4020	Yellow, Black, Red, Brown, Brown	
R6	4020	Yellow, Black, Red, Brown, Brown	

## **Diode Installation**

The diodes are rated at 1 Amp and 400 Volts. Diodes are polarized, so you must align the white stripe on the diode with white stripe on the silk screen. Insert the diode into the silk screen side of the board and solder them on the solder side. The diodes are installed flush to the PCB. Note that LED's will be installed later.

Lead Spacing 0.4"			
Desig	Type	Marking	Done ✓
D1	1N4004	4004	
D2	1N4004	4004	
D3	1N4004	4004	
D4	1N4004	4004	
D5	1N4004	4004	
D6	1N4004	4004	
D7	1N4004	4004	
D8	1N4004	4004	

## **Power Resistor Installation**

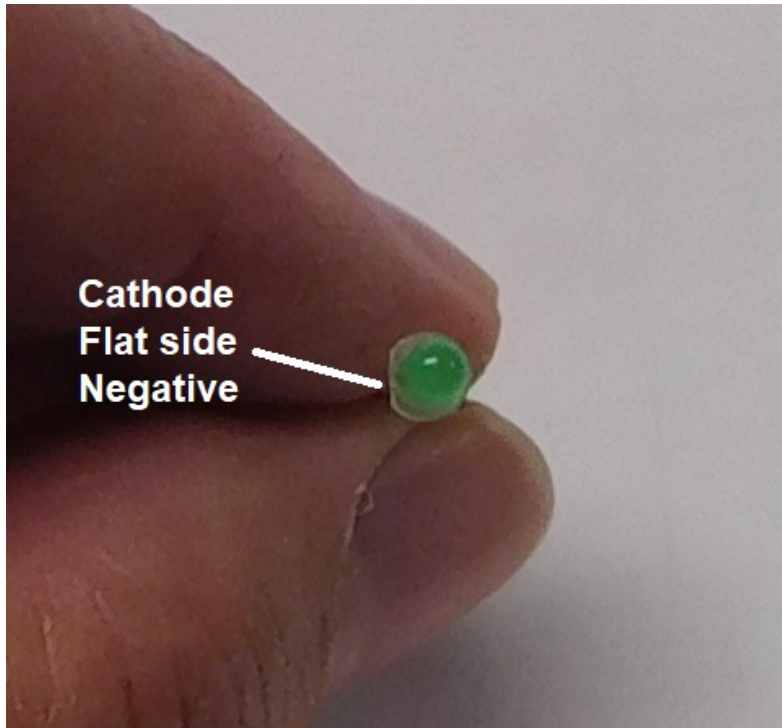
Install R318, a 3.3 Ohm 1 Watt resistor.

## **LED Installation**

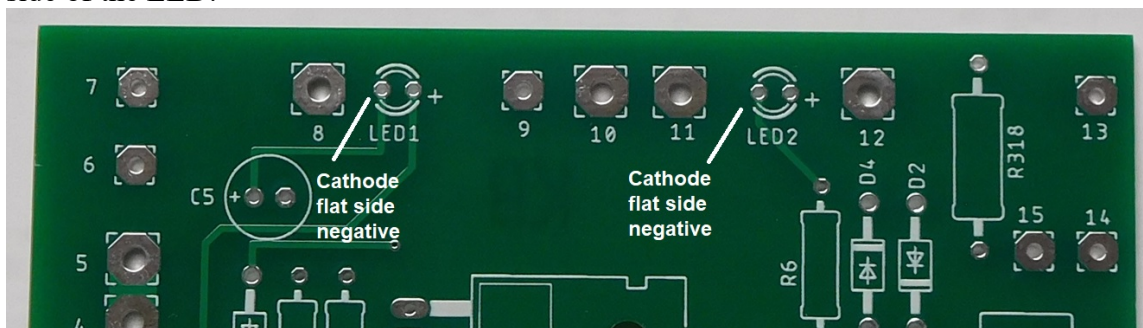
Install LED1 and LED2. Unlike resistors, LEDs are polarized. There is only one right way to install them. You can identify the positive and negative side of an LED as follows:

1. Given uncut leads, the longer of the two leads is the ANODE (positive) lead.
2. Looking down onto the body, you'll see a round outline with a flat on one side. That flat is closest to the CATHODE (negative) lead.





**Figure 2-The Cathode or negative lead of an LED is nearest the flat side of the package**  
 Note that the LED1 and LED2 silk-screens have a + sign making the ANODE or positive side of the LED.



**Figure 3-Locating LED Cathode and Anode on the PCB**

### ***Regulator Installation***

Now you'll install IC1 and IC2, the Positive and Negative regulators, along with their heatsinks. You'll use 4-40x5/16" Philips head screws, 4-40 keps nuts, and thermal compound.

Desig	Value	Done ✓
IC1	LM317 adjustable positive regulator	
IC2	LM337 adjustable negative regulator	

Refer to the cover illustration for assembly details. Double check that the regulator type matches the silk screen location. Spread a thin film of thermal compound on the back of each regulator before installing it onto the heatsink and screwing the assembly down to the board.

## Capacitor Installation

With the exception of C3, all of the capacitors installed here are polarized. Make sure to align the non-negative side of the capacitor with the plus sign.

Desig	Value	Done ✓
C1	2200 uF, 25 Volts	
C2	2200 uF, 25 Volts	
C3	10 nF, 250V (non-polar)	
C4	47 μF, 35 Volts	
C5	47 μF, 35 Volts	

## Removing the Old PC30

Label the following wires prior to removing the old PC30. You may find that dismantling the old PC30 from its mounting brackets may make this easier. Remove and reserve the hardware. It will be reused to install the new PC30.

PC30 Eyelet	Description	Notes about connections on the PC30
1	To positive 75V fuse common (fuse block terminals 3 and 4)	Terminals 1 and 2 are connected
2	To positive diode bridge output, terminal 3	
3	+13V output, to PC29 eyelet 18	
4	To negative 75V fuse common(fuse block terminals 7 and 8)	Terminals 4 and 5 are connected
5	To negative diode bridge output, terminal 1	
6	Chassis ground lug near C2	
7	-13V output, to PC29 eyelet 12	
8-13	No connection	
14	First blue wire from power transformer	Terminals 14 and 15 are connected
15	No connection	
16	Blue/Yellow wire from power transformer	Terminals 16, 17, and 18 are connected
17	Ground connection for PC29 eyelet 15.	
18	No connection	
19	Second blue wire connection from power transformer	Terminals 19 and 20 are connected
20	Common Terminal of Dynaguard Lamps DL and DR	

Figure 4-PC-30 connections may be useful to you as you disconnect the wires from the old PC-30 and reconnect wires to the new PC-30.



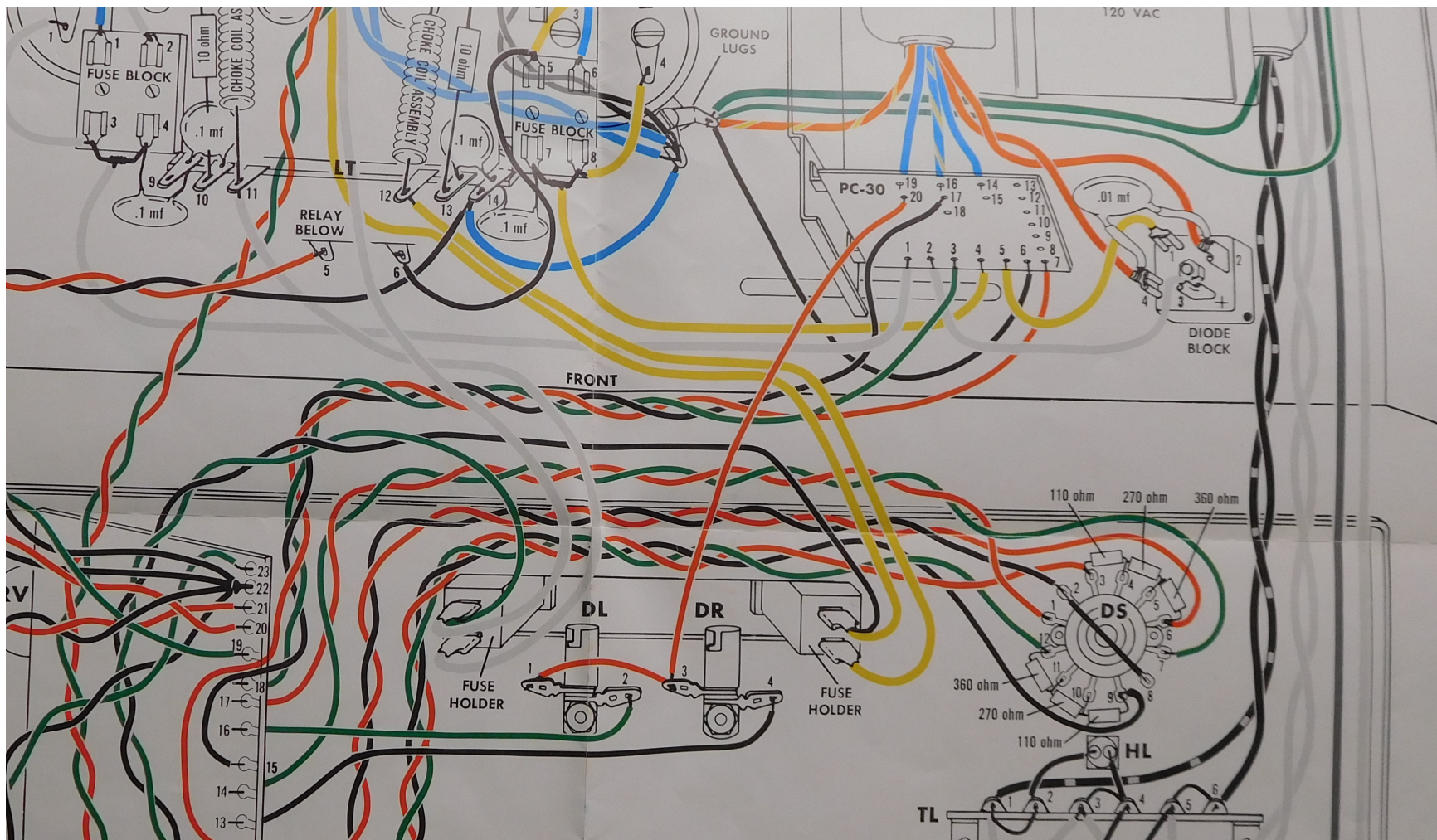
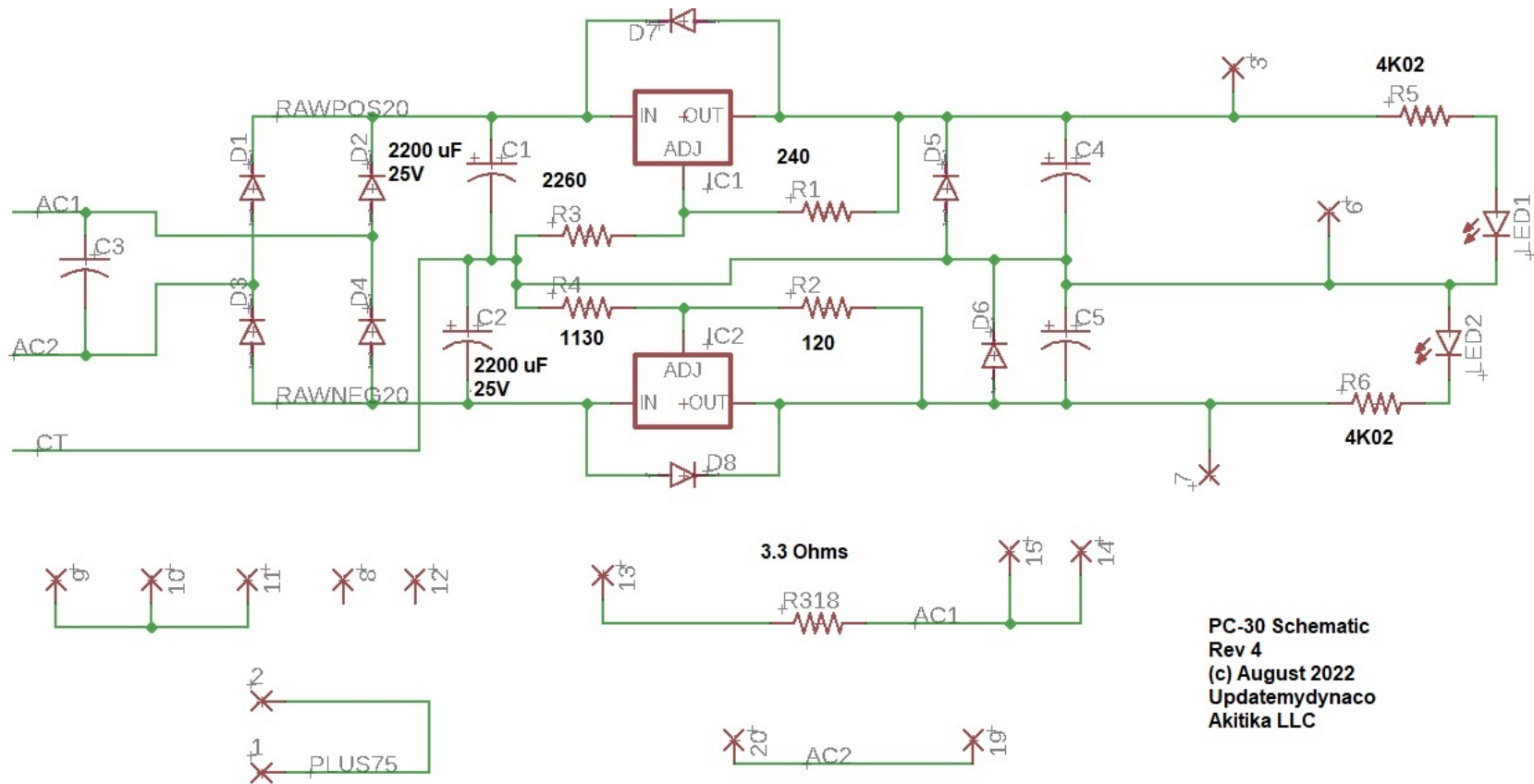


Figure 4-PC-30 connections



PC-30 Schematic  
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Figure 5-PC30 replacement schematic

### ***Installing the new PC30***

Mount the PC30 to the bracket using the original hardware that you had previously set aside. Solder the labeled wires into the new numbered eyelets in the new PC30.