



*High Performance Audio Electronics*

## Model 512 DIY Experimenters Adapter Kit

The Model 512 DIY Adapter Kit allows the user to assemble several types of adapters and the kit includes all the components the experimenter might need for the given application. There are 5 primary applications this adapter kit addresses.

1. The 512 allows you to use a regular DIP8 monolithic single “741 pinout” type integrated circuit op-amp where a 990/2520 footprint device would normally be used. Note however, that this is not a substitute for discrete op-amps where the load presented at the output of the op-amp requires high-current drive capability. This includes driving output transformers. Where high-current drive is not an issue, the 512 will allow the user to experiment.

2. The 512 allows you to use a standard S08 monolithic single “741 pinout” type SMT integrated circuit op-amp where a 990/2520 footprint device would normally be used. Again note however, that this is not a substitute for discrete op-amps where the load presented at the output of the op-amp requires high-current drive capability. This includes driving output transformers. Where high-current drive is not an issue, the 512 will allow the user to experiment.

3. The 512 was originally designed to adapt the Sonic Imagery Labs 99XEnh-Ticha discrete opamp line to a standard DIP8 single “741 pinout” type footprint.

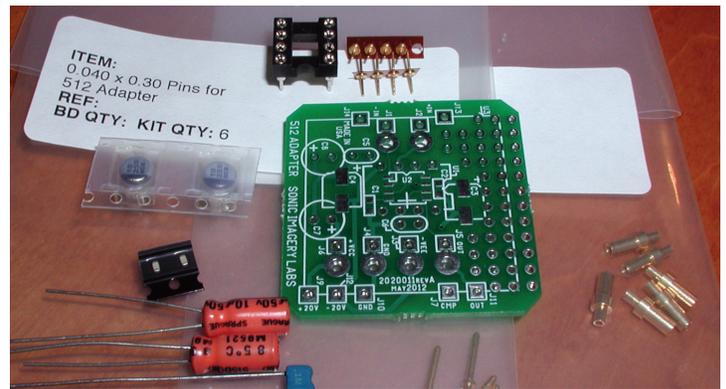
4. The idea of making the 512 a universal adapter came about years ago when we had a client who wanted to use our 99XEnh-Ticha discrete opamps in ADM (Audio Designs and Manufacturing Inc.) gear. Not sure how much of this equipment is still in use, but we added the pin locations to allow the experimenter to do it if the need arises.

5. Everyone likes to tinker. The array of holes at the top of the 512 PCB is there for the experimenter to solder his/her own circuit into. Once your own circuit is built, you can wire it such that your creation can plug into a 990/2520 style footprint, ADM footprint or DIP8 footprint.

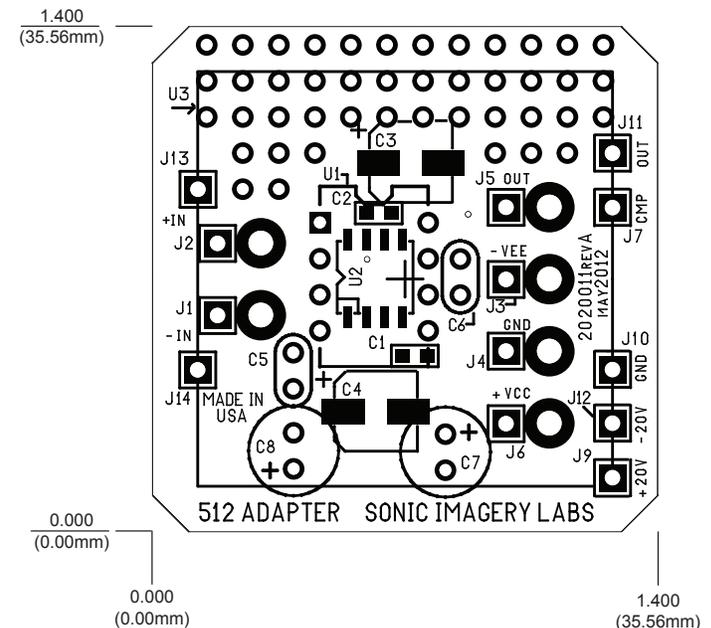
Depending on the adapter type, the user has the option of installing either the SMT or leaded power supply decoupling capacitors.

### Applications:

- Allows Sonic Imagery Labs 99XEnh-Ticha discrete opamp series to be installed in ADM (Audio Designs and Manufacturing Inc.) equipment.
- Allows Sonic Imagery Labs 99XEnh-Ticha discrete opamp series to be installed in into standard single opamp DIP8 sockets.
- Adapt and Experiment with DIP8 or S08 opamps and install into 990/2520 standard footprint.
- Adapt and Experiment with S08 opamps and install into standard single opamp DIP8 sockets.
- Leaded component prototyping area for experimentation.
- The uses are endless.



### Mechanical/Parts Placement:





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### Components/Bill of Materials:

The Model 512 DIY Adapter Kit includes the following components:

Qty 6	PCB Pin Sockets for 99X/2520 Series Opamp
Qty 7	0.040x0.300 Pins for 99X/2520/ADM footprint
Qty 2	10uF 50V Electrolytic Capacitor
Qty 2	0.1uF 100V Ceramic Leaded Capacitor
Qty 2	0.1uF 100V Ceramic 0603 SMT Capacitor
Qty 2	10uF 25V Electrolytic Capacitor 5x5.5 SMT
Qty 1	Machine Pin DIP8 Socket
Qty 10	0.020 Gold Pins "Pin Saver" PINS
Qty 1	Sonic Imagery Labs Model 512 PCB Fab

### 99XEnh-Ticha/2520 Style Discrete OpAmp to DIP8 Style Footprint

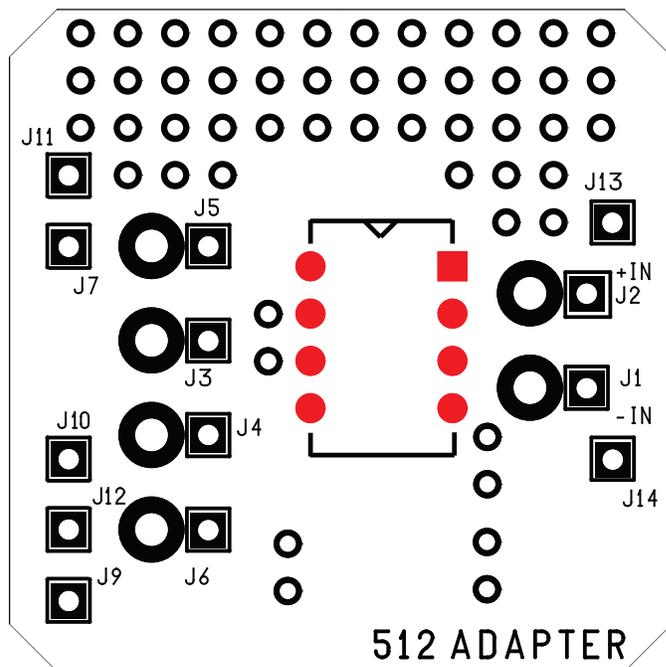
**STEP 1:** Install the 8 - 0.020 Gold Pins "Pin Saver" pins into the DIP8 machine pin socket.

**STEP 2:** Install the DIP8 machine pin socket with gold pins into location shown in **Figure 1** and solder from top side / component side. Make sure notch indicating PIN 1 is orientated correctly. We like to solder the gold pins into the 512 adapter. If we break a pin on the socket, we can pull the socket off and simply replace it without getting out a soldering iron. Installing the socket with PIN SAVER gold pins out works too. We provide 2 extra PIN SAVER pins as well.

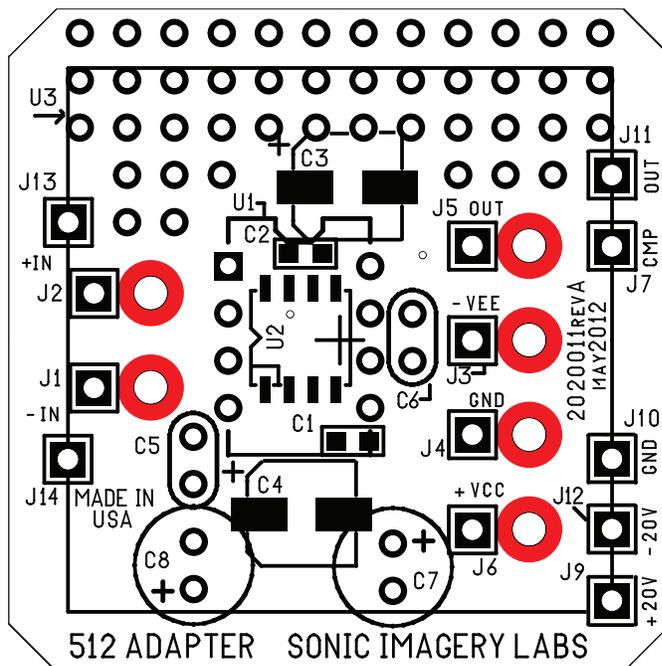
**STEP 3:** Install the 6 - PCB Pin Sockets into locations shown in red in **Figure 2**. and solder from bottom side / solder side of the 512 Adapter. These six sockets hold the discrete opamp quite nicely and allows replacement if needed.

Note that electrically, DIP8/S08 opamps typically do not have a dedicated ground pin. Discrete opamps do need a connection to ground in most cases. Check the equipment you are adapting to. If the DIP8 socket you are plugging the 512 adapter into has an unconnected pin (Usually PIN 1, 5 or 8) one can add a jumper from circuit ground to that unused pin. Then add a jumper wire on the 512 adapter to the same pin of U1 and then to either J4 or J10.

**STEP 4:** The user at this point has the option either to install the leaded or SMT power supply decoupling capacitors. The Sonic



**Figure 1.** Solder Side of PCB showing DIP8 - U1 location in red.



**Figure 2.** Comp/Top Side of PCB showing PIN SOCKET location in red.



## Model 512 DIY Experimenters Adapter Kit

### 99XEnh-Ticha/2520 Style Discrete OpAmp to DIP8 Style Footprint (continued)

Imagery Labs 99XEnh-Ticha series of opamps have 0.1uF capacitors internally, but this may not be the case with other manufacturers. C5, C6, C7 and C8 can also be installed on the solder side of the PCB and leads soldered on compside. These components can also have there leads dressed such that the components are lying at a 90 degree angle flat against the PCB on either compside or solderside of PCB. Mind the polarity on C7 and C8. Electrolytic capacitors usually are marked with a (-) and the lead that is longer is the (+) side. Installing the capacitors incorrectly usually makes smoke.

### DIP8 style OpAmp to 99XEnh-Ticha/2520 Style Footprint

**STEP 1:** Install the DIP8 machine pin socket without gold pins into U1 location shown in **Figure 3** and solder from back side / solder side of 512 PCB. Make sure notch indicating PIN 1 is orientated correctly.

**STEP 2:** Install the 6 - 0.040x0.300 pins into J1, J2, J3, J4, J5, and J6 locations shown in red in **Figure 4** and solder on comp side / top side. It is helpful to insert the pins in the equipment you are adapting to, using it as a jig to hold the pins while soldering them to the 512 adapter board.

**STEP 3:** Install the leaded power supply decoupling capacitors C5, C6, C7 and C8. Mind the polarity on C7 and C8. Electrolytic capacitors usually are marked with a (-) and the lead that is longer is the (+) side. Installing the capacitors incorrectly usually makes smoke. These capacitors can also be installed on the solder side of the PCB and leads soldered on compside. These components can also have there leads dressed such that the components are lying at a 90 degree angle flat against the PCB on either compside or solderside of PCB.

Note that electrically, DIP8/SO8 opamps typically do not have a dedicated ground pin. The power supply decoupling capacitors however do require a ground return. Since we are connecting to a 990/2520 footprint which includes a ground connection, no other connections or modifications are required.

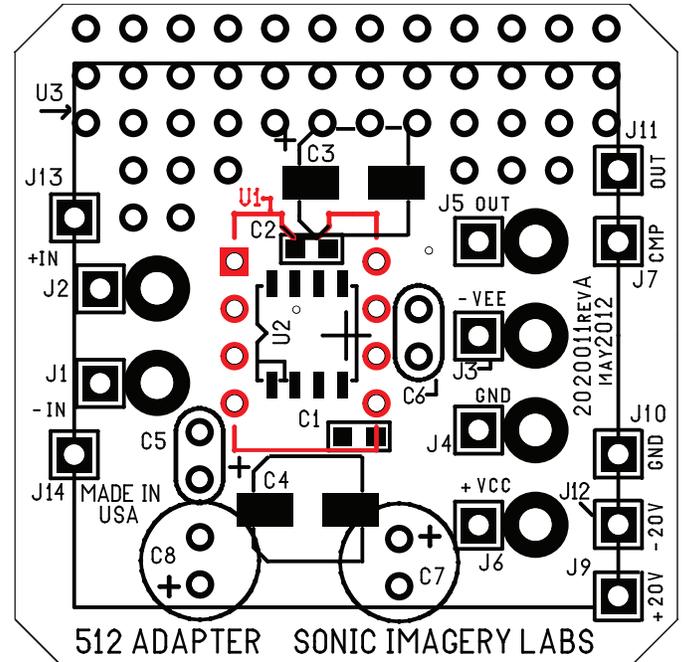


Figure 3. Comp/Top Side of PCB showing DIP8 - U1 location in red.

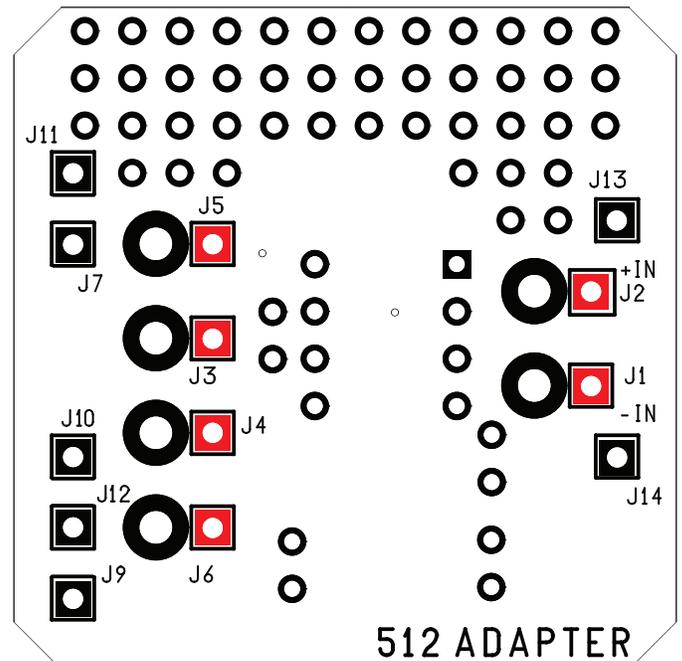


Figure 4. Solder/Bottom Side of PCB showing 990/2520 0.040x0.300 PIN locations in red.



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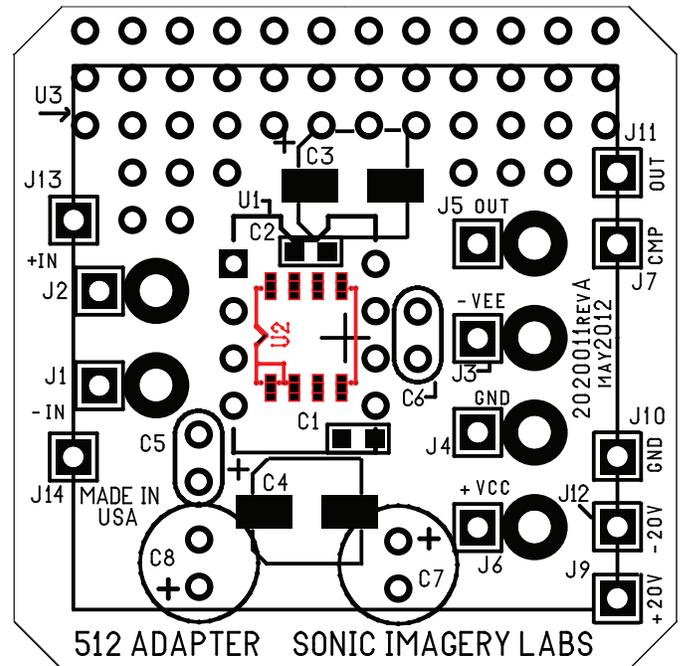
### S08 SMD style OpAmp to 99XEnh-Ticha/2520 Style Footprint

**STEP 1:** Install the S08 SMD op-amp of your choice into the U2 location shown in **Figure 3**. Make sure notch indicating PIN 1 is orientated correctly.

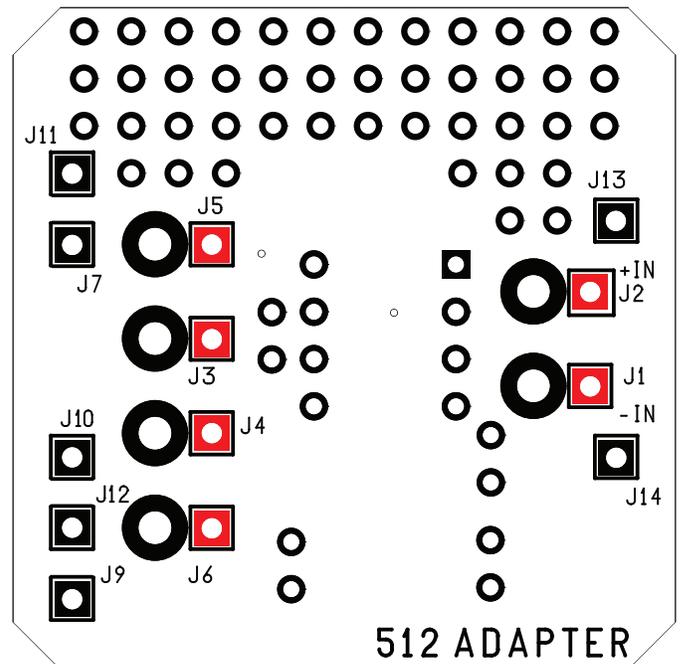
**STEP 2:** Install the 6 - 0.040x0.300 pins into J1, J2, J3, J4, J5, and J6 locations shown in red in **Figure 6** and solder on comp side / top side. It is helpful to insert the pins in the equipment you are adapting to, using it as a jig to hold the pins while soldering them to the 512 adapter board.

**STEP 3:** The user at this point has the option either to install the leaded capacitors C5, C6, C7 and C8 or SMT power supply decoupling capacitors, C1, C2, C3 and C4. Capacitors C5, C6, C7 and C8 can also be installed on the solder side of the PCB and leads soldered on compside. These components can also have there leads dressed such that the components are lying at a 90 degree angle flat against the PCB on either compside or solderside of PCB. Mind the polarity on C7 and C8. Electrolytic capacitors usually are marked with a (-) and the lead that is longer is the (+) side. Installing the capacitors incorrectly usually makes smoke.

Note that electrically, DIP8/S08 opamps typically do not have a dedicated ground pin. The power supply decoupling capacitors however do require a ground return. Since we are connecting to a 990/2520 footprint which includes a ground connection, no other connections or modifications are required.



**Figure 5.** Comp/Top Side of PCB showing DIP8 - U1 location in red.



**Figure 6.** Solder/Bottom Side of PCB showing 990/2520 0.040x0.300 PIN locations in red.



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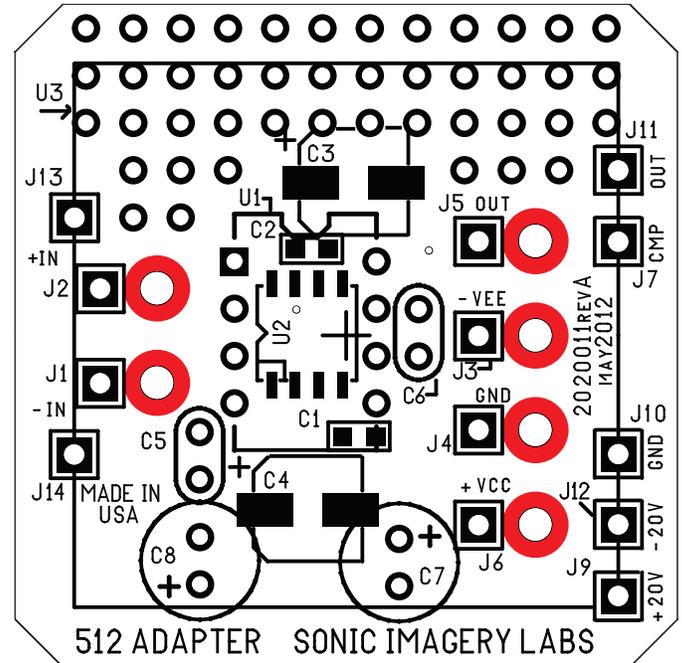
## Model 512 DIY Experimenters Adapter Kit

### 99XEnh-Ticha/2520 Style Discrete OpAmp to ADM Equipment Footprint

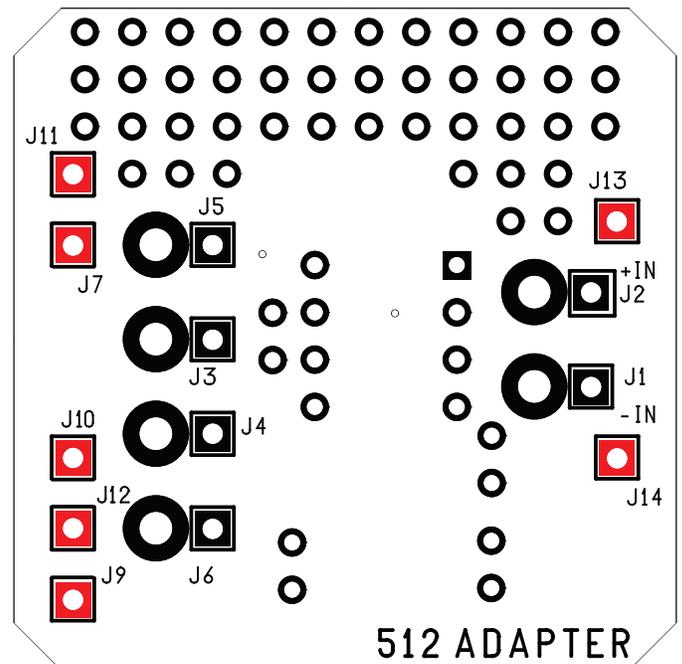
**STEP 1:** Install the 6 - PCB Pin Sockets into locations shown in red in **Figure 7.** and solder from bottom side / solder side of the 512 Adapter. These six sockets hold the discrete opamp quite nicely and allows replacement if needed.

**STEP 2:** Install the 7 - 0.040x0.300 pins into J7, J9, J10, J11, J12, J13, and J14 locations shown in red in **Figure 8.** and solder on comp side / top side. It is helpful to insert the pins in the PCB pin sockets into the equipment you are adapting to, using it as a jig to hold the pins while soldering them to the 512 adapter board. J7, the compensation pin is not electrically connected to the DOA pin sockets on the 512 adapter. Study the equipment you are adapting to and if phase-lead compensation is required, add the appropriate capacitor value across the feedback resistor from the output to the correct input. Using the prototype pads and holes, the user can also simply connect from J5 (output) to J2 or J1 (inputs). This construction allows the compensation to stay with the adapter without mods to the original gear.

**STEP 3:** The user at this point has the option either to install the leaded or SMT power supply decoupling capacitors. The Sonic Imagery Labs 99XEnh-Ticha series of opamps have 0.1uF capacitors internally, but this may not be the case with other manufacturers. C5, C6, C7 and C8 can also be installed on the solder side of the PCB and leads soldered on compside. These components can also have there leads dressed such that the components are lying at a 90 degree angle flat against the PCB on either compside or solderside of PCB. Mind the polarity on C7 and C8. Electrolytic capacitors usually are marked with a (-) and the lead that is longer is the (+) side. Installing the capacitors incorrectly usually makes smoke.



**Figure 7.** Comp/Top Side of PCB showing PIN SOCKET locations in red.



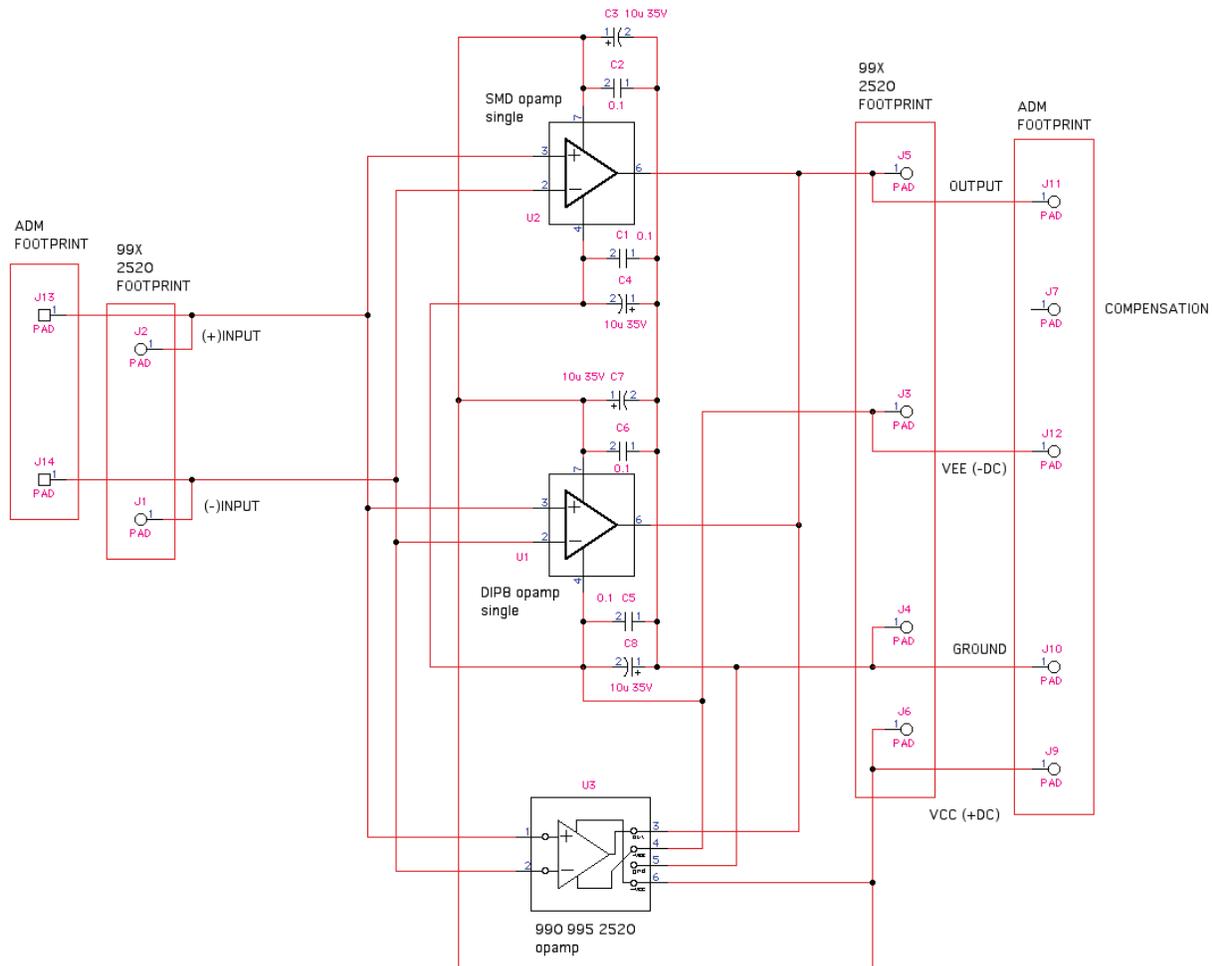
**Figure 8.** Solder/Bottom Side of PCB showing ADM 0.040x0.300 PIN locations in red.



## Model 512 DIY Experimenters Adapter Kit

### Model 512 Adapter Schematic:

The schematic of the Model 512 DIY Experimenters Adapter printed circuit board is shown below in **Figure 9**. No matter which type of operational amplifier, connection, or adaptation is required, the user should not have to make any radical modifications. The prototyping area is not shown on the schematic as it has no trace/electrical interconnections to the adapter circuit.



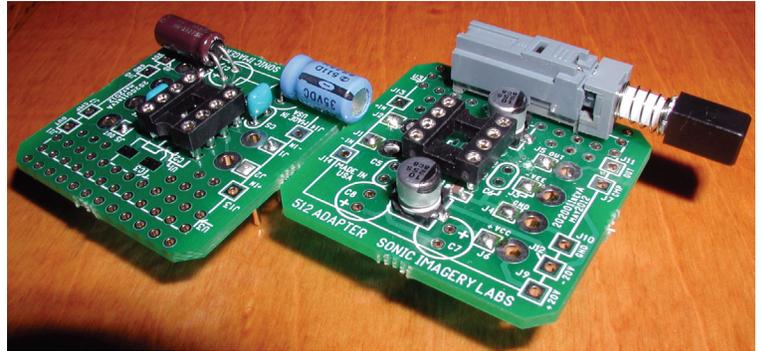
**Figure 9.** Schematic of the Model 512 DIY Experimenters Adapter printed circuit board.



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### Floobydust:

The Model 512 DIY Experimenters Adapter kit built showing the 2 styles of power supply decoupling arrangements. The adapter on the right has a quad DPDT switch in the prototyping area to allow testing a dual opamp configuration. As we mentioned in the features section of this datasheet, the uses are endless. The right hand adapter hack allows us to evaluate dual opamps without building a completely new DUT fixture which are large, expensive and time consuming to recreate. Pushing the button switches I/O's from opamp A to opamp B.



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