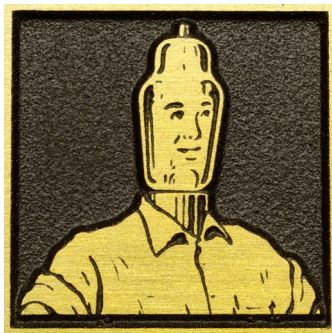




S.E.X. Manual V2.1

A guide to constructing the
Single Ended eXperimenter's
integrated loudspeaker/headphone amplifier V2.1



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ACKNOWLEDGEMENTS

Thanks to Paul “Brainiac” Joppa for doing the lion’s share of the circuit design and layout scheme used in this kit. Thanks to John “Buddha” Camille for all his mentoring in proper grounding techniques thru the years. We miss you, boss. Thanks also to Queen Eileen Schmale for putting up with yet another of Dr. Bottlehead's cockamamie schemes.

What the S.E.X. kit is about

The original Single Ended eXperimenter’s kit was developed as an affordable way to experience the magical sound of single ended triode amplifiers. After a long and successful run the original S.E.X. amp was retired. We developed a new stereo integrated version of S.E.X. to make inexpensive single ended sound accessible to both speaker and headphone listeners, and this second revision incorporates several improvements in component quality and ease of assembly.

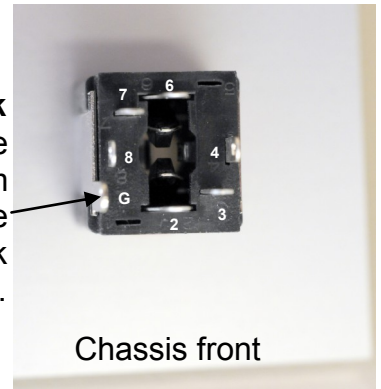
Brief circuit theory

The circuit uses 6DN7 tubes to create a two stage parallel feed single ended stereo integrated amplifier. The output is via a parafeed transformer which can be configured to accommodate 4, 8 and 16 ohm speakers as well as headphones of virtually any impedance via a 32 ohm output configuration.

The pseudo dual mono power supply consists of fast recovery soft start rectifiers feeding a voltage doubler. The 6DN7 heaters are supplied with filtered DC from a Schottky rectifier bridge for very low noise performance with high efficiency speakers and headphones. Power output is approximately 2 watts per channel. The Input impedance of the stereo volume control is 100K ohms. Using the 8 ohm tap, gain is 15 dB at 1kHz. and S/N is better than 83dB.

Headphone jack

() Remove the nut and washer from the headphone jack and install the headphone jack in the round hole in the front left corner of the chassis from the underside. The ground tab on the side of the jack body should be toward the volume pot hole. The tabs are numbered on the body of the jack as shown.



Binding Posts

() The binding posts come with interchangeable black and red insulators. Use the black insulator on top for the left channel and the red insulator on top for the right channel. Begin by removing the two nuts and the washers from each of the pairs of posts and slipping the binding posts out of the insulators.

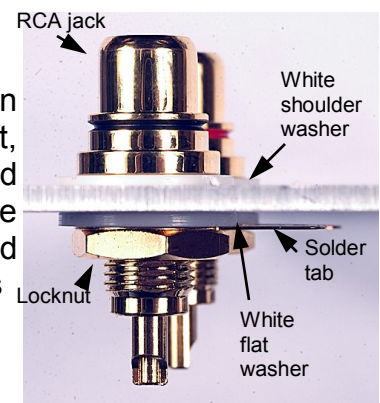
() set a red insulator on top of the pair of holes closest to the power entry module. Put a red binding post in the right hand hole (closest to the

power entry module) and a black post in the left hand hole. From the underside slip on another red insulator over the post shafts. Make sure the posts are twisted until they lock in the locking slots to keep them from spinning. Then slip a washer and a nut over each binding post shaft and tighten. Thread a second nut over each post and tighten.

() Repeat the process using the black insulators in the other set of binding post holes.

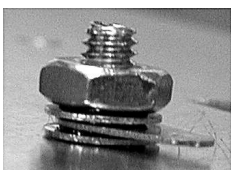
RCA jacks

() Now install the input RCA jacks in the holes shown in the photo on page 7 (left rear corner of chassis). The black RCA jack goes to the left, and the red RCA jack goes to the right. First install the white shouldered washer in the hole from the top, then insert the RCA jack. Flip the chassis over and install the other white washer, the gold solder tab and one lock nut. Tighten the nuts securely. Make sure that the solder tabs point forward when tightening the nuts.



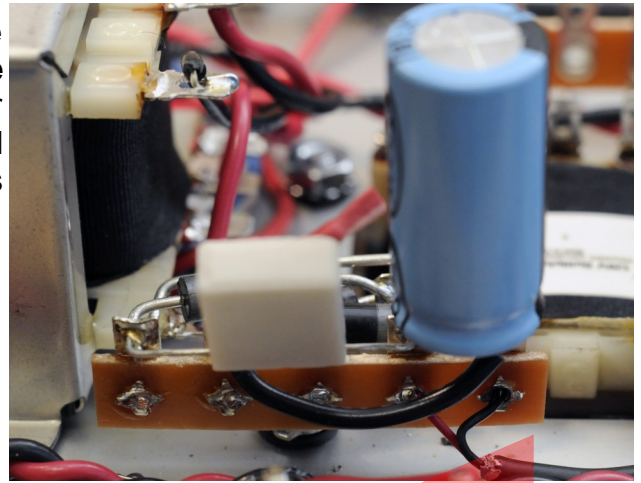
Safety ground

The safety ground connects the chassis to the ground wire of the power cord. This connection is to safely shunt off any high voltage that might accidentally come in contact with the chassis.



() Insert a #8 screw through the hole nearest the power entry module. Stack a lock washer, a #8 solder tab pointing to the front of the chassis, and another lock washer, and secure with a #8 nut. (note: the solder tab is shown facing the wrong way in the photo on page 16)

the capacitor body and the terminals. **It is imperative that this capacitor is properly oriented with the black striped-side lead in terminal C1.** Solder terminals C1 and C2 and trim the excess leads. Bend the capacitor leads 90 degrees so the capacitor stands vertically.



High voltage rectifiers

The pseudo-dual mono B+ or high voltage supplies use a voltage doubler. **The orientation of the rectifier diodes is absolutely critical.** Refer to the photos for proper orientation of the components.

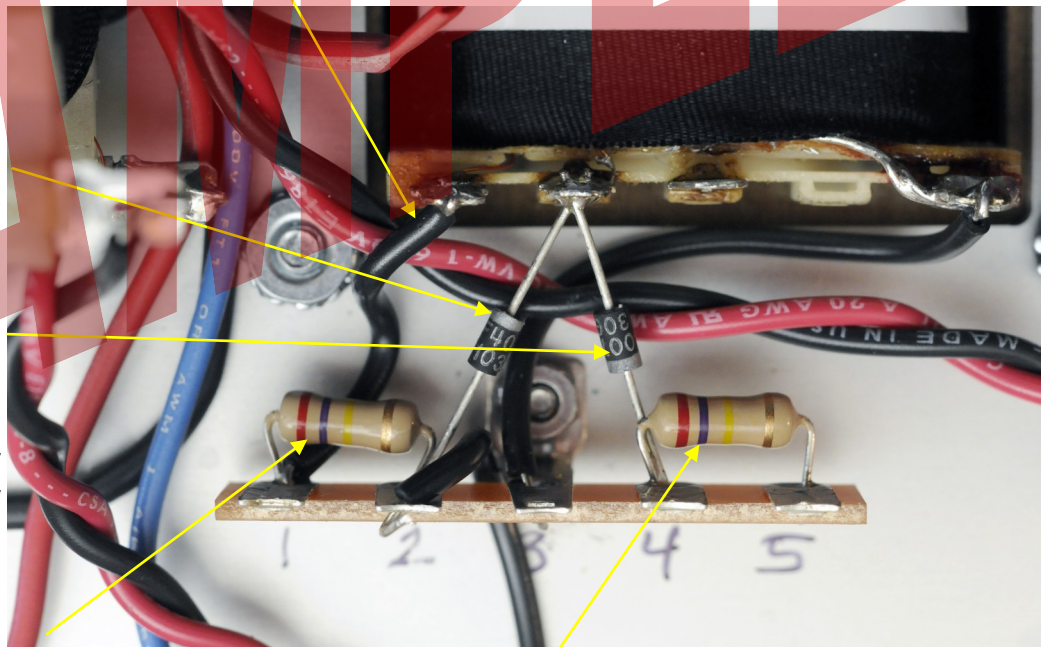
() Cut a 1-3/4" (43mm) length of black hookup wire and strip both ends back 1/4" (6mm). Attach one end to power transformer terminal 6 and solder. Attach the other end to terminal 1L, do not solder.

() Attach the striped end lead of a UF4007 diode to power transformer terminal 7 and the black end lead to terminal 2L. Do not solder.

() Attach the striped end lead of a UF 4007 diode to terminal 4L, do not solder. Attach the black end lead to power transformer terminal 7. Solder power transformer terminal 7.

() Attach one lead of a 270K ohm 1Watt resistor to terminal 1L and the other lead to terminal 2L. Be sure to install the resistor on the side of the terminal strip nearest the power transformer, as shown. Solder 1L, 2L.

() Attach one lead of a 270K ohm 1Watt resistor to terminal 4L and the other lead to terminal 5L. Be sure to install the resistor on the side of the terminal strip nearest the power transformer, as shown. Solder 4L, 5L.



Resistance check

Once you have completed a visual inspection of the circuit the next step is to perform a resistance check of the circuit. This will help to assure that parts have been connected to the proper terminals and soldered properly before any AC mains voltage is applied to the circuit.

() Turn the volume control all the way down. This would be a good time to install the volume knob...

() Also install the 6DN7 tubes in their sockets.

() Attach the negative lead (typically black) of a volt-ohm meter to the ground buss. A good spot to do so is terminal 23. Use of a clip lead to connect the black test lead to the ground buss will free one hand, making testing much easier and safer. Using the positive lead (typically red) of the volt-ohm meter, check the resistance of the following terminals. They should read roughly like this:

*Note that the term K denotes x1000, and the term Ω denotes ohms, so $1K\Omega$ equals 1000 ohms. $1Meg\Omega$ equals 1,000,000 ohms. The values signified with a * are going to vary from ohmmeter to ohmmeter because these terminals are connected to the filter capacitors, which try to charge themselves off the battery in the meter, causing a fluctuating reading. If the circuit is connected properly these readings will wander in the tens or hundreds of Kohms or higher range. What you want to watch out for is a zero reading at one of these terminals, which would indicate that something is mis-wired.*

Terminal	Resistance
Center pin - input jacks	0Ω volume set to min, $100K\Omega$ volume set to max
1	*
2	0Ω
3	0Ω
4	*
5	*
6,16	*
7,17	0Ω
8,18	0Ω
9,19	$249k\Omega$
10,20	*
11,21	*
12,22	0Ω
13,23	0Ω
14,24	$11.5K\Omega$
15,25	890Ω
A1,B1	$249k\Omega$
A2, B2	*
A3, B3	680Ω
A4,B4	$11.5K\Omega$
A5,B5	*
A6,B6	$1.27K\Omega$
A7,B7	174Ω
A8,B8	*
C1,C2,C4,C5	*

If the resistance values are not within 10 or 15% of these values, recheck the wiring to the terminal which gives a deviated reading.