

Assembly and Operation of the  
Audio Electronic Supply  
AE - 1





## AE-1 DUAL MONO PREAMPLIFIER

### INTRODUCTION

The Audio Electronic Supply AE-1 is a control center for your high-end stereo and video system. The AE-1 is used in conjunction with the basic power amplifier. An ideal match is the companion SE-1 single-ended stereo power amplifier.

One of the most exciting features of the AE-1 preamplifier is the circuit design. The AE-1 utilizes a direct cathode coupled, grounded grid amplifier circuit. The first stage is the direct coupled buffer driving a grounded grid gain amplifier in turn driving a output follower buffer. The input signal phases is not altered in this straight forward circuit. One might consider the AE-1 as a "straight-wire" preamp with gain.

All you'll need are a few simple tools and a soldering iron along with enthusiasm and you can build the Audio Electronic Supply AE-1 preamp in a weekend. The AE-1 offers three source inputs and is designed as a dual-mono preamp on one chassis. Everything is complete to the last screw and bolt. To top off this beautiful package, wooden side rails add a true distinction to your home brewed AE-1.

Operating the AE-1 preamplifier is a simple procedure since the unit is designed for long term stability in virtually any home operating situation. The AE-1 is a sophisticated electronic instrument, despite the straight-forward design and minimal user required adjustment; therefore, damage may result if the unit is constructed or operated outside the parameters outlined in this owner manual. Please read this manual carefully before putting your new Audio Electronic Supply AE-1 preamplifier in operation.

### TOOLS:

Following is a list of tools that you will need in order to complete your AE -1.

- 1] 5/64" Allen head screw driver  
- It is recommended that this part be built like a screw driver although an allen wrench will work.
- 2] 5/16" Nut driver or socket
- 3] 1/2" Nut driver or socket
- 4] 1/4" Nut driver or socket
- 5] 12mm Nut driver or socket
- 6] 10mm Nut driver or socket
- 7] Large phillips screw driver
- 8] Small phillips screw driver
- 9] Large flat tip screw driver
- 10] Medium size needle nose pliers
- 11] Wire cutters
- 12] 16 - 24 awg. wire strippers
- 13] 60 watt, 700 - 800 degree tip soldering iron
- 14] 1 roll of good quality 60-40 or 50-50 resin core solder.

UNPACK THE KIT CAREFULLY AND CHECK EACH PART AGAINST THE PARTS LIST. DO NOT DISCARD ANY PACKING MATERIAL UNTIL THIS HAS BEEN DONE. In so doing, you will become acquainted with each part and the chance of accidentally throwing away some part will be eliminated.

Resistors can be conveniently sorted by inserting one of the leads into the corrugated edge of the shipping carton flap. It may be helpful to mark the value of the component on the flap so the part may be readily located when needed.

**CAUTION:** We strongly urge that you follow the wiring and parts layout shown in this manual. The position of leads and parts is quite critical in the pre-amplifier and changes may seriously affect the characteristics of the circuit. We do not represent that the circuit or layout cannot be improved. However, the methods outlined in this manual are the result of many experimental models and unless the constructor has access to full laboratory facilities, we recommend that instructions be followed very closely.

On the page titled TWEAK SHEET you can find upgrades and improvements that we do recommend as they have also been time proven. We hope that you will have fun experimenting with you amplifier in these areas.

### STEP-BY-STEP ASSEMBLY INSTRUCTIONS

The instructions are given below in a simple, logical, step-by-step sequence. They will enable you to complete your kit easily with the least probability of confusion. Be sure to read each step all the way through before any work is done. A space ( ) is provided before each step for you to check off the operation when it is completed. In this way, you will waste no time returning to the job should you be interrupted.

#### PLEASE DO THE FOLLOWING BEFORE ANY WORK IS DONE:

1. Attach the large fold in pictorial to the wall above your work space for easy reference.
2. Lay out all of the parts in orderly fashion so the they may be located readily when needed.
3. Place an old folded bath towel or some similar material over the portion of the bench or table on which you will be working. This will not only protect the table, but also avoid marring or scratching of the pre-amp. chassis.
4. Completely read the manual all the way through.

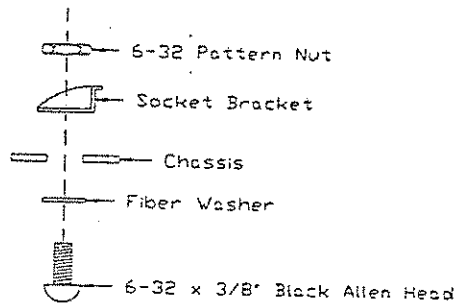
Most assembly operations will be repeated several times as parts are mounted to the chassis. These assemblies are shown in detail beneath each instruction. They are the small drawings designated detail 1, detail 2, etc. They will be referred to frequently in the steps following. After you have done the operation once or twice you will no longer need to refer to the details.

## WOOD PANELS

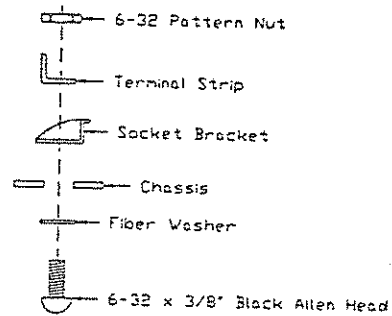
- ( ) Mount the wood panels to the side of the chassis using the 6-32 x 5/8" allen screws. These can be driven using a 5/16" allen head screwdriver. The panels can be mounted on either side of the chassis.

## TUBE SOCKETS

- ( ) 8 pin tube sockets are mounted using holes A1-A8 as instructed in detail 1. Figure 1 shows the orientation of the key way. The key way points towards the front of the chassis. The screw shown in this detail requires the use of a 5/64" allen head driver. Do not tighten the screws all of the way until you center the tube socket in the hole. The holes A1 & A3 contain 5 lug terminal strips; A5 - A8 contain 3 lug terminal strips. These parts should be mounted on top of the tube socket brackets as shown in detail 2.



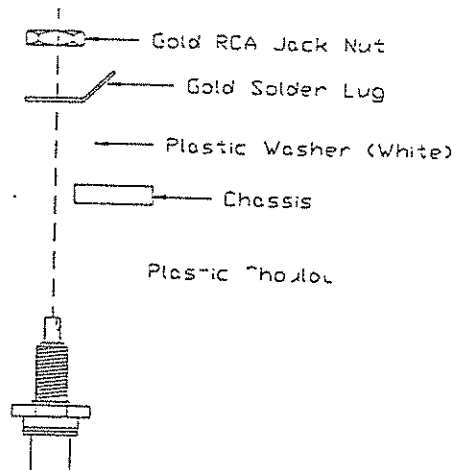
Detail 1



Detail 2

## REAR PANEL

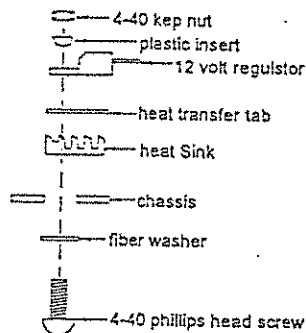
- ( ) Mount the RCA Jacks as shown in detail 9.
  - Grounding lugs should point towards the top of the chassis.
  - Use a 12mm nut driver or socket to tighten the jack. A pair of pliers can hold the nut on the inside of the chassis while the jack is turned to tighten it.



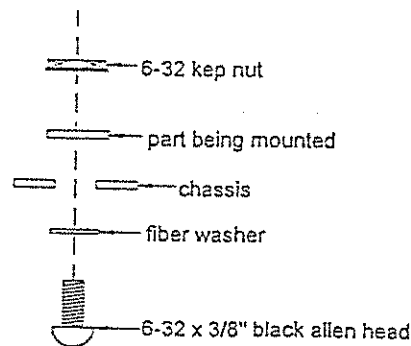
- ( ) Mount AC/Power Jack with 2 6-32 x 3/8" allen head screws with 6-32 kemp nuts on the inside of the chassis.
  - A Bent lug goes under the kemp nut on the side where the paint has been scraped from the chassis.
  - The ground connection (center) should be closer to the bottom of the chassis.
- ( ) Mount fuse holder with the hardware that is attached to it. The fiber washer goes on the outside of the chassis. Orient the fuse holder so that you have easy access to the solder terminals. A pair of pliers can be used to tighten the nut.

#### MISCELLANEOUS PARTS

- ( ) Mount 12 volt regulators in holes B1 & B2 using detail 3. Refer to figure 1 for orientation.
- ( ) Mount 560uF 400v electrolytics in holes E1-E8 using detail 4.
  - The capacitors are oriented with the positive side towards the front of the chassis.
- ( ) Mount a 3-lug terminal strip in hole D1 using detail 4. Refer to figure 1 for orientation.



Detail 3



Detail 4

#### POWER TRANSFORMER

The power transformer must be mounted carefully as some of the screws that hold the transformer to the chassis also hold parts inside of the chassis. Please read through all of these steps before continuing to mount the transformer. I recommend that you place the transformer upside down on the table surface and feed the wires up through the holes on the upside down chassis. Line the holes in the chassis up with the holes in the transformer plate. I recommend that you start all of the screws before tightening any of them completely. This will allow you to move the transformer in order to get all of the screws started. The screws can then be tightened securely to the chassis. Refer to figure 1 for orientation of the parts that are held into the chassis by the transformer screws. The seam on the transformer can point towards the rear of the chassis.

- Use 6-32 x 1/2" Chrome phillips screws in the transformer.
- ( ) C2 holds a BR102 (Do not tighten this too tight as the bridge may crack)
- ( ) C3 holds a 5 lug terminal strip
- ( ) C4 holds a 3 lug and a 5 lug terminal strip

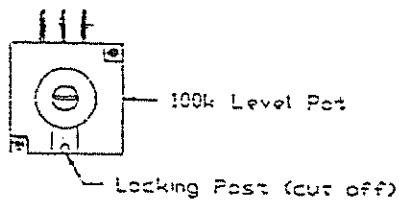
## FRONT PANEL

### LEVEL POTENTIOMETER

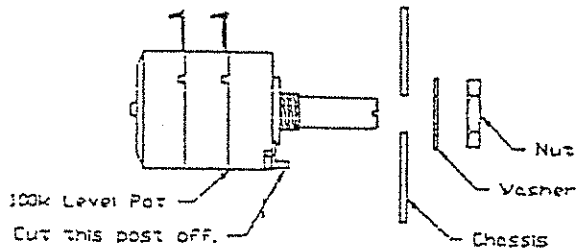
Some preparation must be done to the level pots before they can be installed in the chassis.

- The locking post on the front of the pot must be cut off as there is no hole in the chassis for this post.

- ( ) Mount the two level pots on the front of the chassis as shown in detail 6



Detail 5



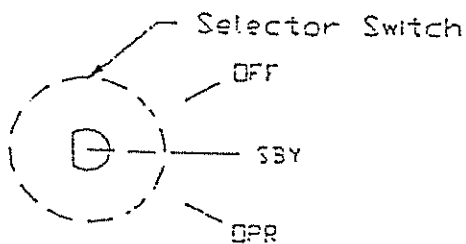
Detail 6

### SELECTOR SWITCHES

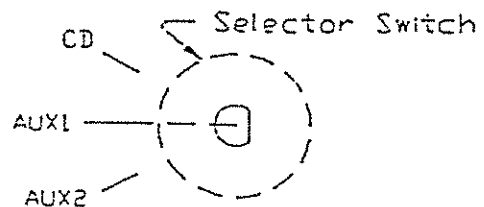
Some preparation must also be done to the selector switches before they can be mounted to the chassis. Both of the switches are mounted in exactly the same way.

- Cut off the small plastic locking post that is similar to the one on the level pot.
- Remove the nut, star washer, and the position locking washer.
- turn the selector all the way to the left (counterclockwise) until it will not click any more.
- Place the position locking washer so that the tab is in the hole that is labeled '3'.
- Place the lock washer on the switch.

- ( ) Mount the switches in the chassis making sure that the position locking washer does not slip out and fall into a new position. Finger tighten the nut until the switch is secure against the chassis.
- You should notice that the switch has 3 positions or 2 'clicks'. Position the selector so that it is in the middle (1 'click' over).
  - Align the flat part of the switch to be perpendicular to the line of the middle selection (details 7 & 8).
  - Tighten the switch with a 1/2" nut driver or socket until it is snug (not too tight, it can be damaged).



Detail 7



Detail 8

- ( ) Insert the LED holder into the hole in the front of the chassis.



### SPECIFICATIONS:

Circuit type:.....Pure, Class A Triode

Input Impedance:.....82,000 $\Omega$

Output Impedance:.....800 $\Omega$

Gain:......5v input = 2v output: 12dB gain

Signal to Noise ratio:.....-88dB

Tube Compliment:.....4 - 6SN7

Input & Output jacks:.....Gold plated with Teflon inserts.

Input Power Requirements:.....117v or 220v 50-60Hz

Power Consumption:.....Operate : 40watts  
Stand-by : 32watts

Dimensions:.....5 9/16"H x 14"W x 10"D  
14.1cm x 35.6cm x 25.4cm  
Allow 2" to 3" additional shelf space for cables and power cord

Net Weight:.....15 lbs (6.8Kg)

Shipping Weight:.....20 lbs (9.1Kg)

## TWEAK SHEET

If you would like to elevate your new AE -1 to an even greater performance level you may wish to include some of the following up-grade tweaks. All of these items are available in your AES catalogue.

### Oil filled .1, .22 & 2.0 Coupling Caps:

.1 $\mu$ F 400v	\$ 24.00/ea.
.22 $\mu$ F 600v	\$ 30.00/ea.
2.0 $\mu$ F 200v	\$ 98.00/ea.

The closest you can get to the ideal of no resistance, no leakage, and no inductance. These oil filled capacitors are the ideal cap for AC audio coupling from the input tube to the output tubes in your AE 1. A word is in order about the stock coupling caps in the AE 1. Audio electronic supply utilizes very high quality caps as a standard in your AE 1. They are .22 $\mu$ F 600v metalized polypropylene and 2.0 $\mu$ F 200v & .1 $\mu$ F 450v of the same construction. The oil caps are far expensive to use as a standard part in production and still offer such a reasonable price on the mighty AE 1. With the .1, .22 & 2.0 oil caps installed, you will have a mid-range bloom as never before along with incredible bass definition. The highs will come through as if "liquid syrup" was filling the sound stage.

### 5692 Input Tubes (RCA & GE):

\$ Call

This new old stock tube is an upgrade to the 6SN7 Golden Dragon. The sonic improvements include an increased width and depth of sound.

### Kimber RCA Jacks:

\$ 25.00/pr

Kimber RCA connectors are precision machined for a perfect fit. The contact surface is Ultra-Plate, a special process from Kimber Kable, which resists fracturing, flaking and oxidation. The existing RCA connectors in your AE 1 must be removed and the chassis hole needs to be expanded to 1/2"

### Kimber Power Cord:

\$ 150.00/ea.

Designed for delivering clean AC power to your pre-amp. The patented braid's unique design serves to cancel out any harmful magnetic fields that add noise and distortion to audio components. An excellent upgrade for all of your audio equipment.

### Soft Shoes & Tip Toes:

Soft Shoes	\$ 12.00/ea.
Tip Toes	\$ 12.00/ea.

The hard rubber feet on your AE 1 can be replace with large soft rubber pads that can have an aluminum tip toe inserted under them for unbelievable isolation of the AE 1. Vibrations from the music in the listening room can cause colorations on the audio amplifier and preamplifier. Utilizing these isolation feet will dramatically float the AE 1. A very simple tweak to perform. The tip toes fit directly into the Mod-Squad soft shoes.



111A Woodwinds Industrial Court, Cary, NC

Call • 919-460-  
Fax • 919-460-

**Notes:**

Now that you have finished stuffing the chassis, it is time to begin the prewire and final wire stages of construction. Following you will find instructions for placing each piece of wire that you can check off as you go along. Please refer to the fold out sheet at the rear of the manual for descriptions of the lettering and numbering of the parts.

I recommend that you completely finish wiring the amplifier before you begin any soldering. You can then solder the whole amplifier at one time and reduce the chances that you may forget to solder something.

On the following pages you will find drawings of the inside of the chassis with wires drawn between all of the parts in the chassis. Use the guides on the facing pages to help you determine where the wires will go.

**Red / White / Blue twisted wire**

- ( ) - Red from S1-A to LP1-3
  - White / Blue from H5 to LP1-1
  
- ( ) - Red from S1-C to LP2-3
  - White / Blue from H5 to LP2-1

**Black Orange twisted wire:**

- ( ) - Black from S2-A to C5
  - Orange from S2-3 to B3

**4 Conductor gray cables:**

These cable run from the various inputs to the input selector switch in the following manner

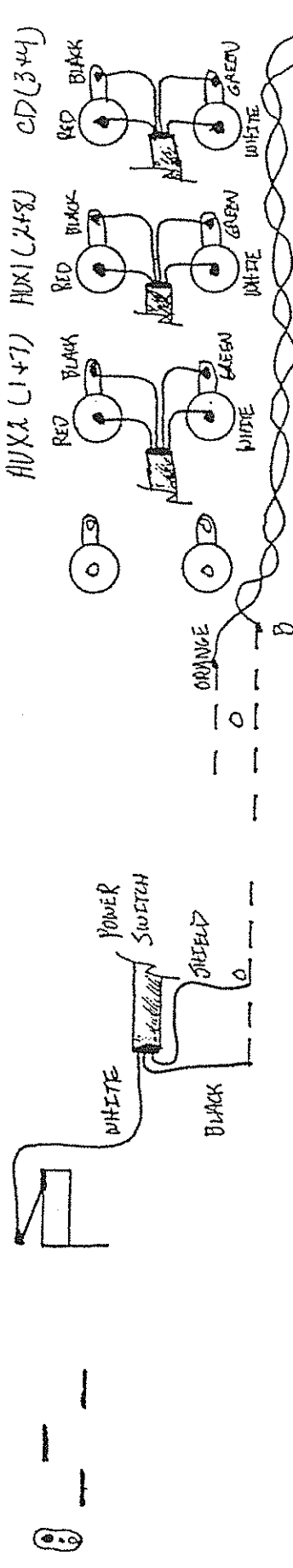
- Red - center of right channel
- Black - ground tab on right channel
- White - center of left channel
- Green - ground tab on left channel

- ( ) 19 1/2" piece from AUX2 input to S1
  - Red - Pin 1
  - White - Pin 7
  
- ( ) 20 1/2" piece from AUX1 input to S1
  - Red - Pin 2
  - White - Pin 8
  
- ( ) 21 1/2" piece from CD input to S1
  - Red - Pin 3
  - White - Pin 9

The Extended Black, Green, & Shield wires are connected to H3.

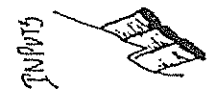
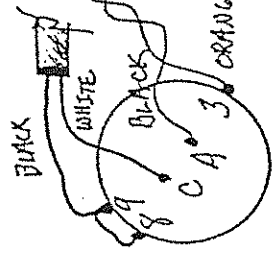
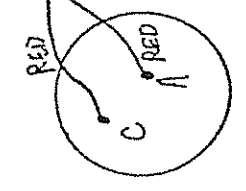
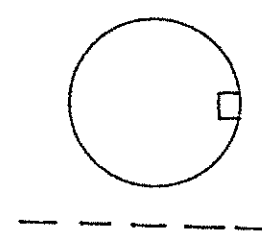
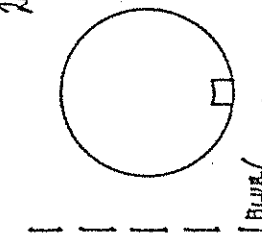
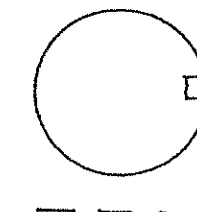
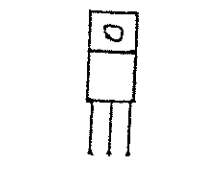
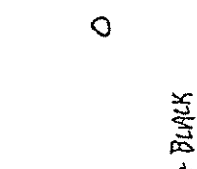
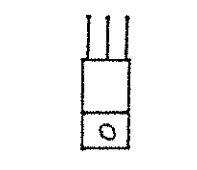
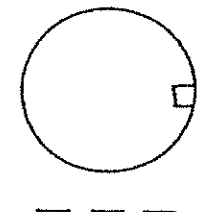
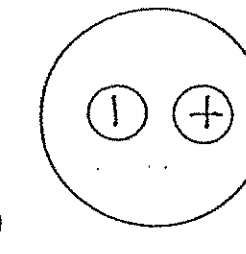
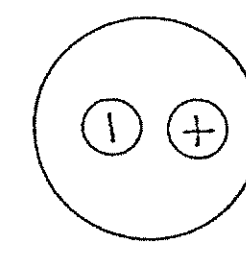
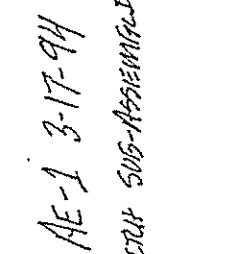
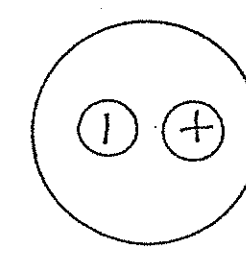
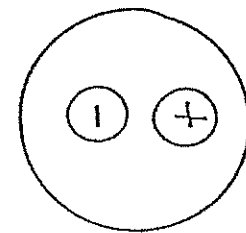
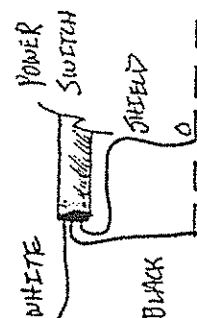
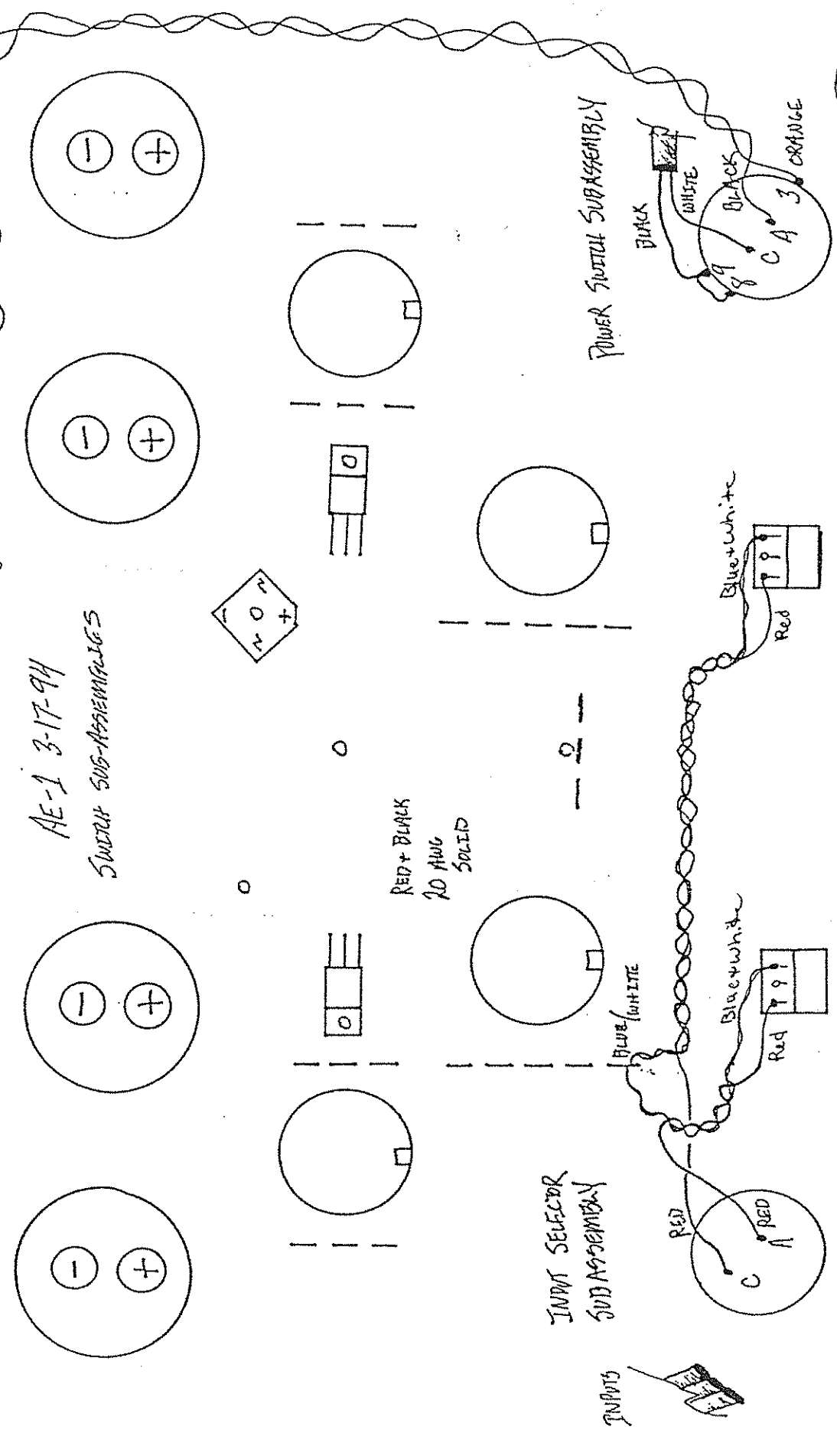
**2 Conductor gray cable:**

- ( ) Shield to A3
  - White from top of fuse holder to S2-C
  - Black from A1 to S2-9
  - Jumper from S2-9 to S2-8 (any scrap of wire can be used for this jumper)



AE-1 3-17-94

SWITCH SUB-ASSEMBLYS



**Co-Axial Wire Sub-assemblies:**

- ( ) 11" piece from Left output to G3  
- Shield goes from ground tab to G2
- ( ) 15" piece from Right output to D3  
- Shield goes from ground tab to D2

**Power Supply Sub-assemblies: (sub-assemblies #1 & #2)**

#1) Solder lugs are attached to E1 & E2 with black wires on the negative and red wires on the positive.

- ( ) 5" Black wire to A3
- ( ) 6" Red wire to A2
- ( ) 3" Red wire to K5
- ( ) 22k $\Omega$  2watt to D1
- ( ) .22 $\mu$ F 600v Kimber Kap red to D1

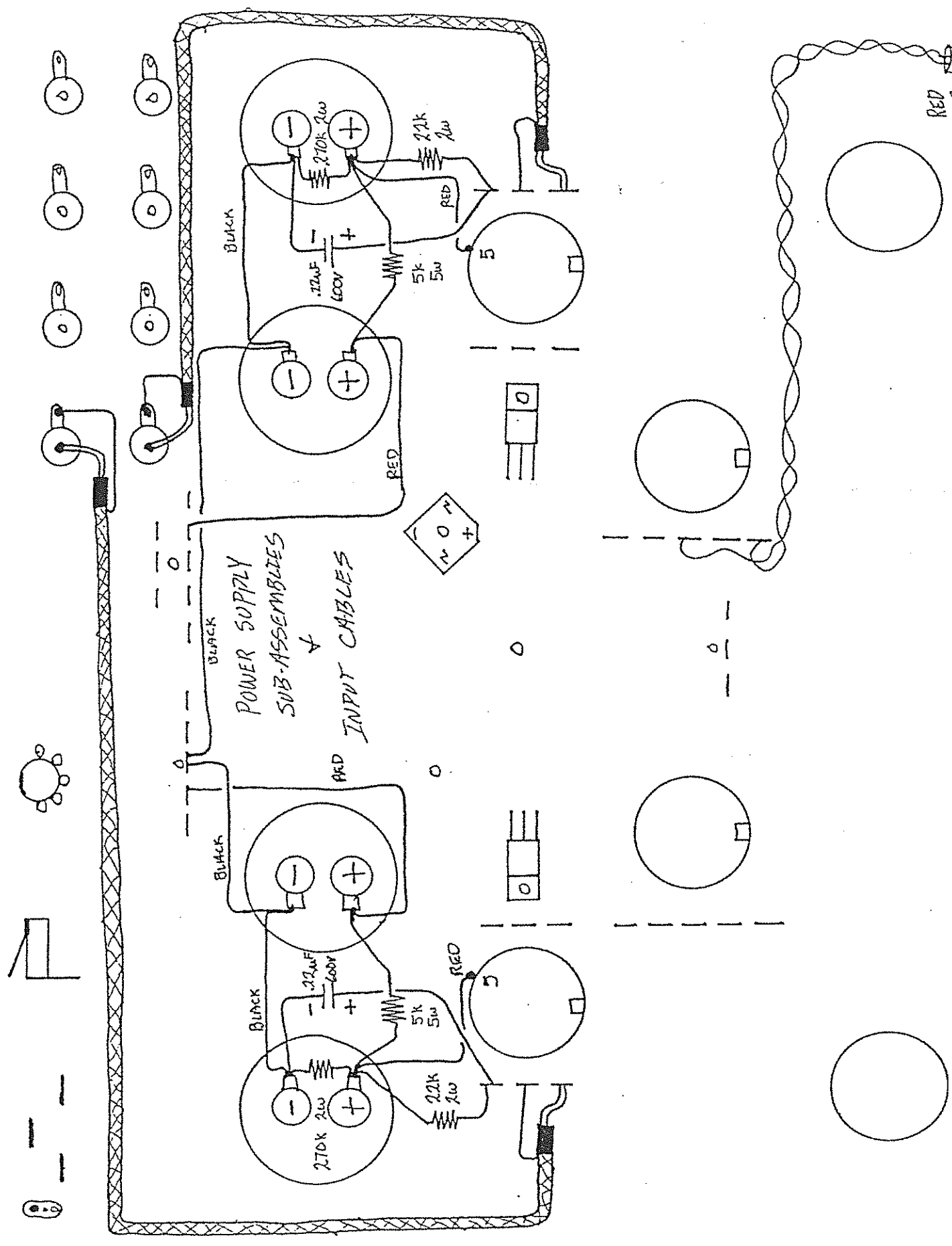
#2) Solder lugs are attached to E3 & E4 with black wires on the negative and red wires on the positive.

- ( ) 8" Black wire to A3
- ( ) 6" Red wire to C4
- ( ) 3" Red wire to L5
- ( ) 22k $\Omega$  2watt to G1
- ( ) .22 $\mu$ F 600v Kimber Kap red to G1

**Red LED:**

Insert the LED assembly into the LED holder in the front of the chassis.

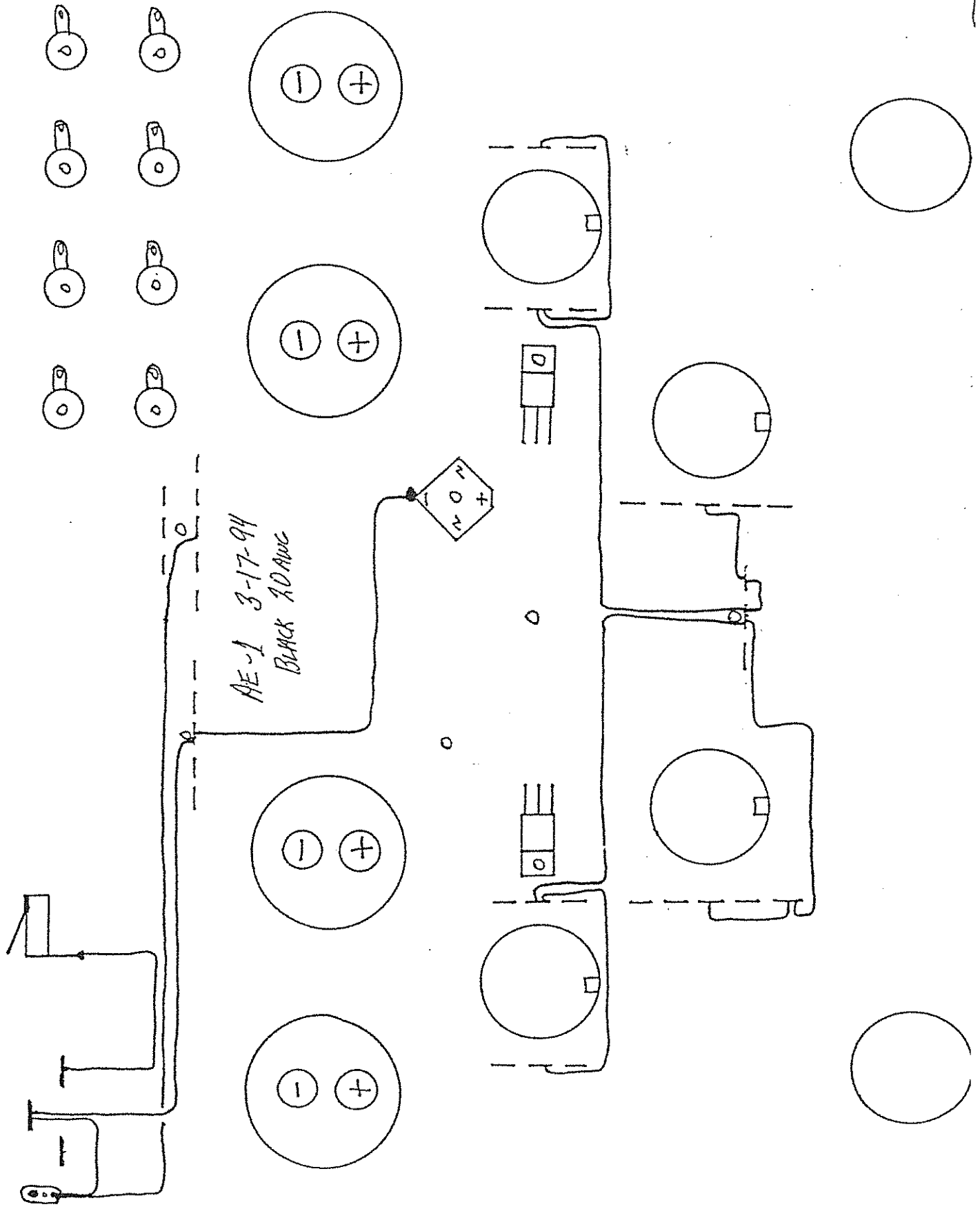
- ( ) Black to J3
- ( ) Orange to J5



Black 20 awg. Solid core wires:

- ( ) GP-1 to AC Power-G
- ( ) GP-1 to C3
- ( ) AC Power-G to A3
- ( ) AC Power-L to End of fuse holder
- ( ) A3 to BR2-3
- ( ) D2 to E2
- ( ) E2 to I2
- ( ) I2 to F2
- ( ) F2 to G2
- ( ) H3 to H5
- ( ) H5 to I2
  
- ( ) I2 to I3
  
- ( ) I3 to J3





**Red 20 awg. Solid core wire:**

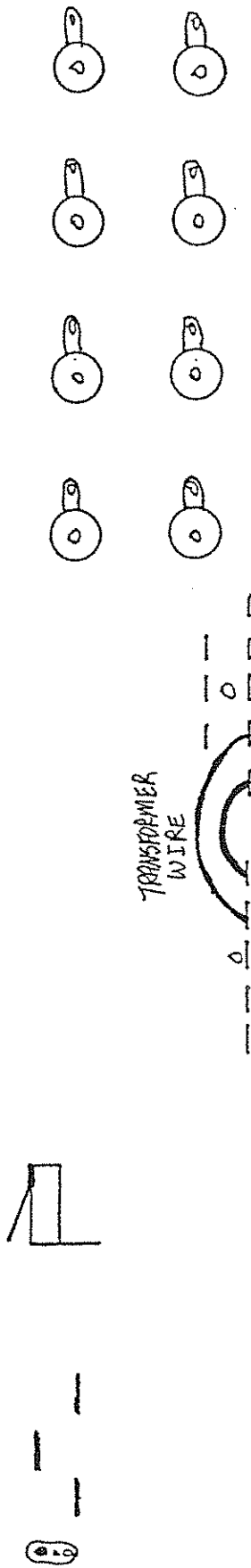
- K1 to K4
- K2 to K5
- K3 to K6
- L1 to L4
- L2 to L5
- L3 to L6
- M3 to M6
- N3 to N6
- D1 TO H1
- G1 to J1
- M5 to K1
- N5 to L1
- M2 to H1
- N2 to J1

**Red Kimber Wire (multi-stranded copper wire):**

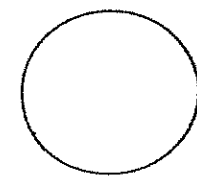
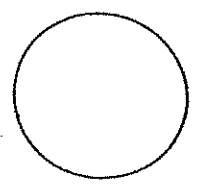
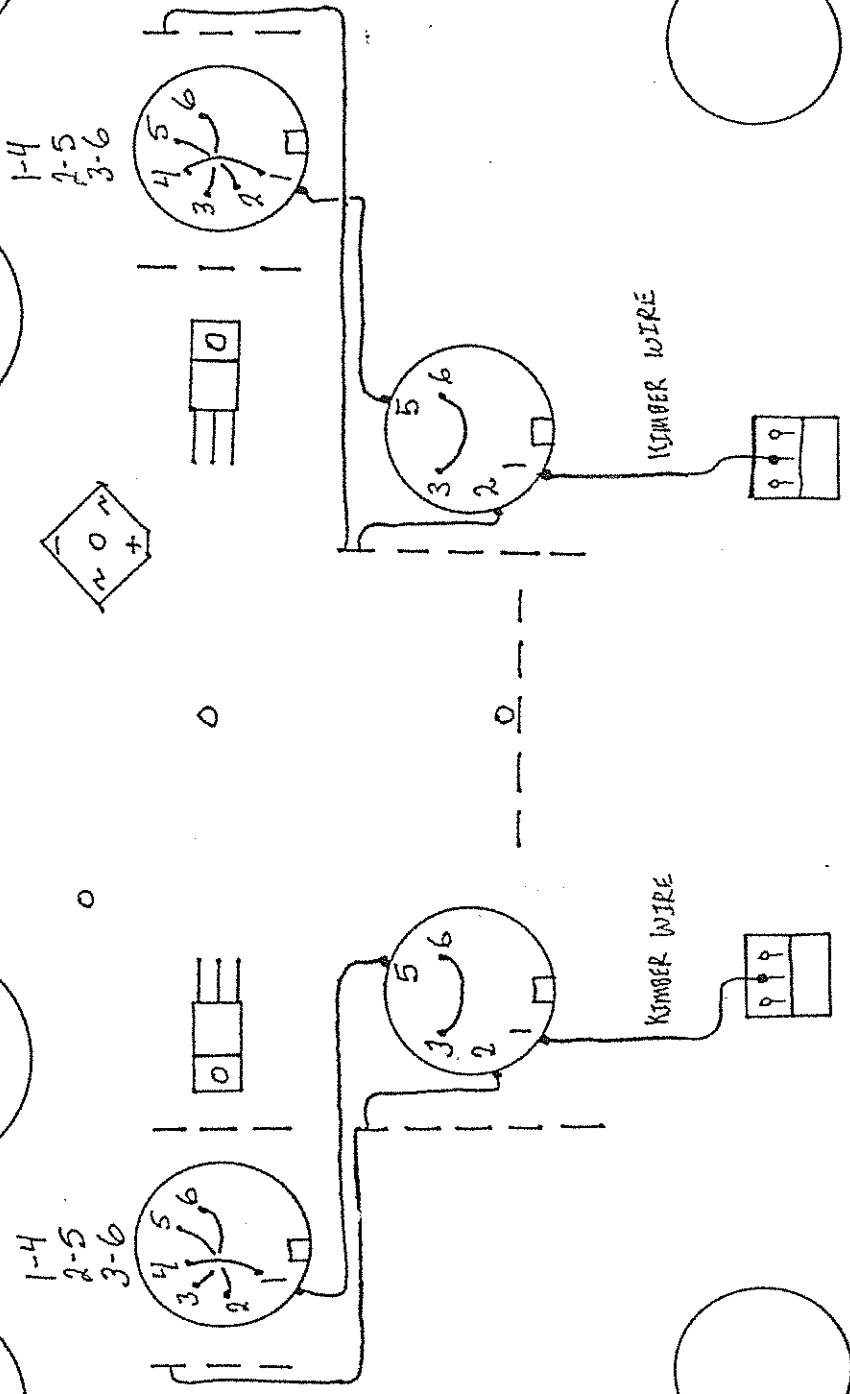
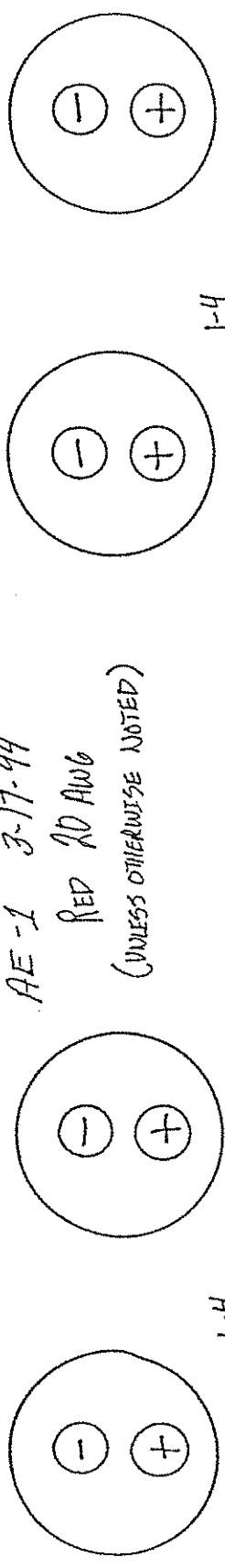
- LP1-2 to M1
- LP2-2 to N1

**Red Heavy Wire (multi-stranded silver wire, can use clippings from power transformer):**

- A5 to C1
- A4 to C2



AE-1 3-17-94  
 RED 20 AUG  
 (UNLESS OTHERWISE NOTED)



Tack solder wires on to voltage regulators as you go along. The pins break very easily so be careful and try not to bend them too much.

**Blue 22 awg. Solid core wire:**

( ) VR1-3 to BR2-1

( ) VR2-3 to BR2-1

( ) K8 to L7

( ) M7 to N8

**Yellow 20 awg. Solid core wire:**

( ) VR1-1 to N7

( ) VR2-1 to K7

**Black 20 awg. Solid core wire:**

( ) VR1-2 to BR2-3

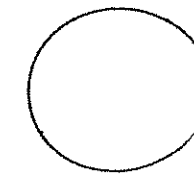
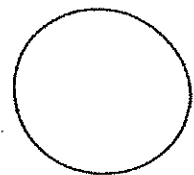
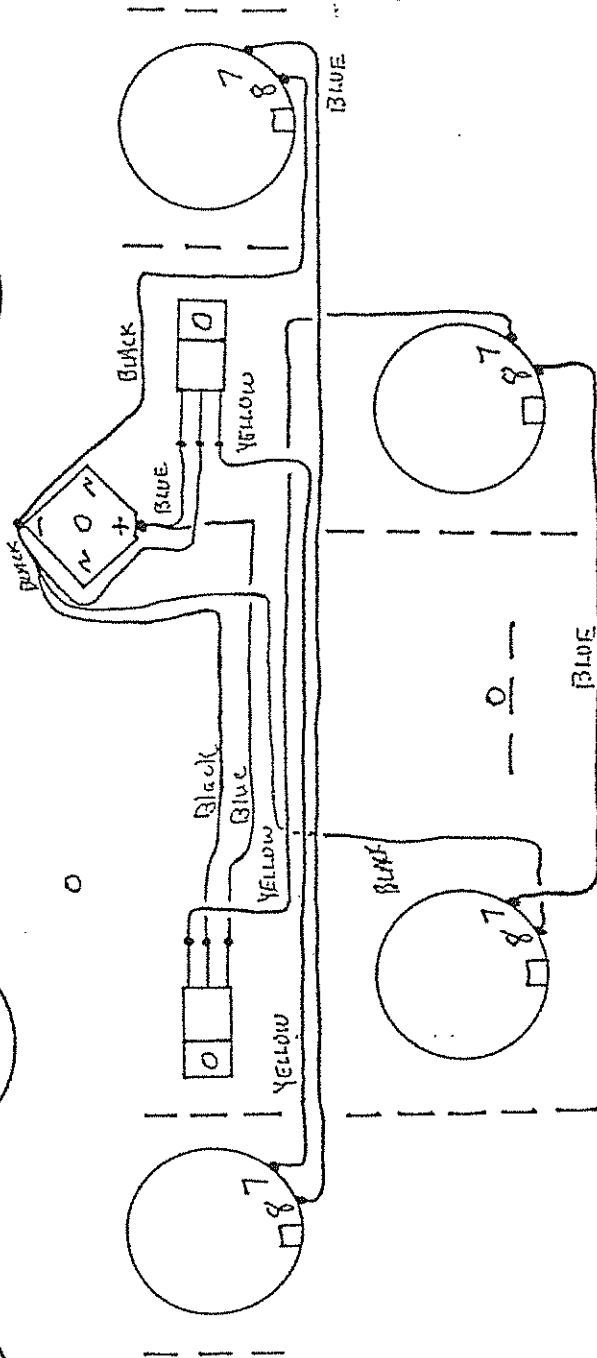
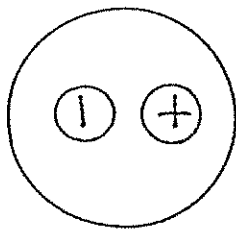
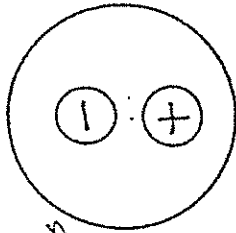
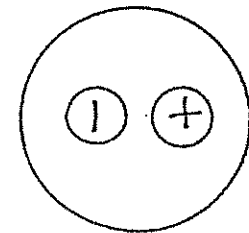
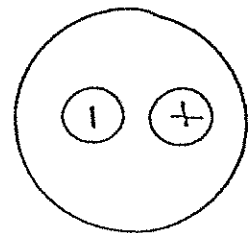
( ) VR2-2 to BR2-3

( ) BR2-3 to M8

( ) BR2-3 to L8



AE-1 3-17-94  
 AC/DC RECTIFIERS  
 VOLTAGE REGULATORS



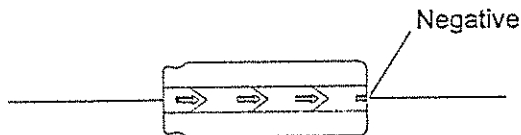
Capacitors:

- |  |  |
|--|--|
| ( ) 100 $\mu$ F 450v<br>- Positive to D1<br>- Negative to Large Electrolytic w/ solder lug | ( ) 100 $\mu$ F 450v<br>- Positive to G1<br>- Negative (same as other) |
| ( ) .1 $\mu$ F 450v Kimber Kap<br>- Black to K3<br>- Red to E3                             | ( ) .1 $\mu$ F 450v Kimber Kap<br>- Black to L6<br>- Red to F3         |
| ( ) .22 $\mu$ F 600v Kimber Kap<br>- Red to K6<br>- Black to D3                            | ( ) .22 $\mu$ F 600v Kimber Kap<br>- Red to L3<br>- Black to G3        |
| ( ) 2.0 $\mu$ F 200v Kimber Kap<br>- Red to K6<br>- Black to D3                            | ( ) 2.0 $\mu$ F 400v Solen<br>- One leg to L3<br>- One leg to G3       |
| ( ) 2200 $\mu$ F 25v<br>- Positive to BR2-1<br>- Negative to BR2-3                         |  |
| ( ) 2200 $\mu$ F 25v<br>- Positive to BR2-1<br>- Negative to BR2-3                         |  |

Resistor:

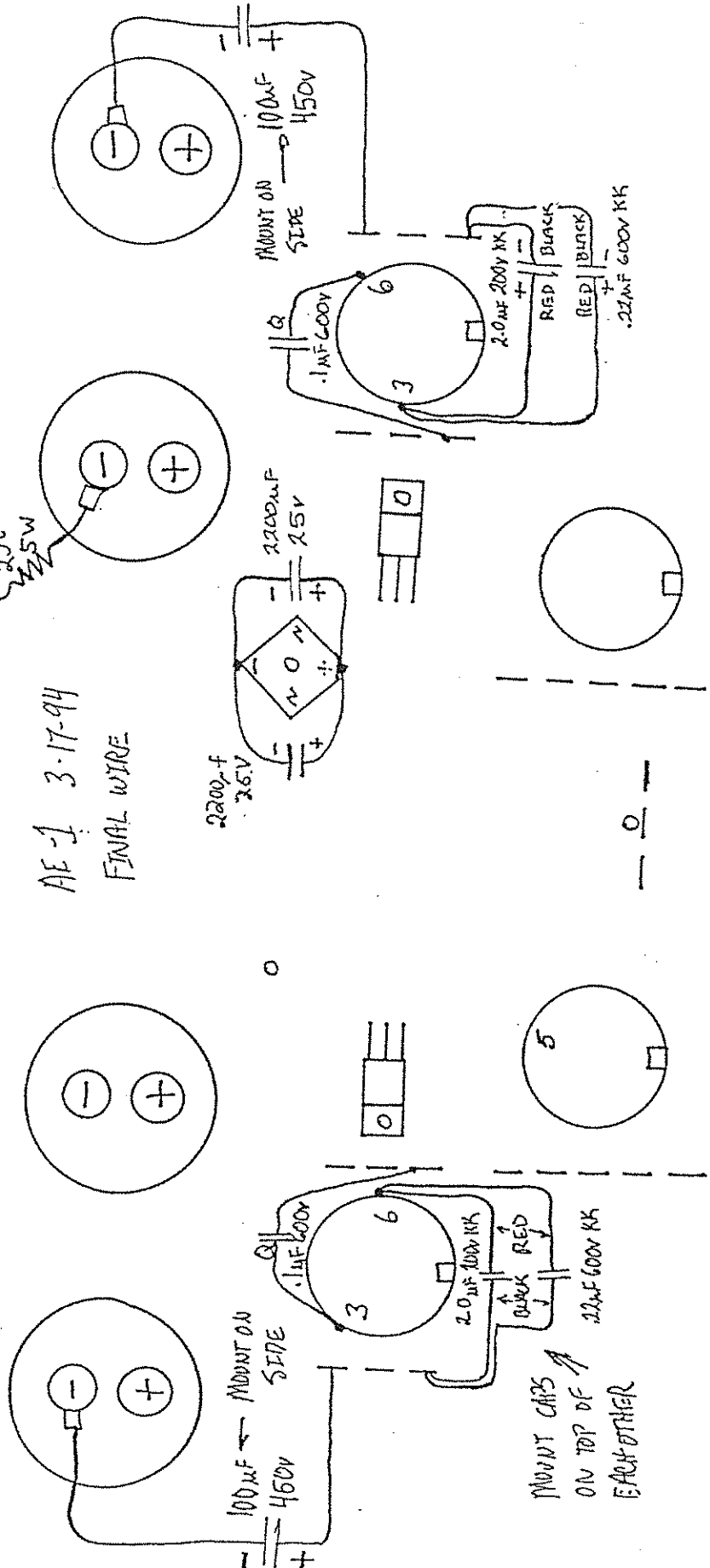
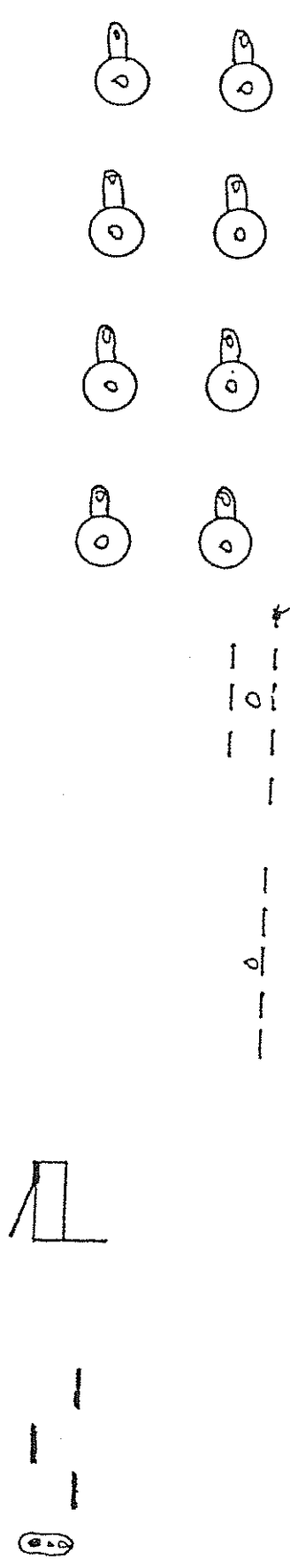
2 $\Omega$  5watt

( ) C5 to E3(-)



This picture is used to demonstrate the orientation of the Nichicon style capacitors.

Note: Due to market and supply influences, It may sometimes be necessary to substitute one value of a component for another (e.g. 47 $\mu$ F for 100 $\mu$ F etc.) These changes will in no way affect the performance of your pre-amplifier.



Resistors:

4.7k $\Omega$  1/2watt (4751 or 4701)

- M6 to H3
- N6 to J3
- N7 to J5

8k $\Omega$  1/2watt (8001)

- M4 to H3
- N4 to J3

100k $\Omega$  1/2watt (1003)

- M4 to E3
- N4 to F3
- H1 to M5
- J1 to N5

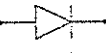
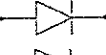
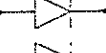
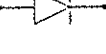
470k $\Omega$  1/2watt (4753 or 4703)

- D2 to D3
- G2 to G3
- H3 to M1
- J3 to N1

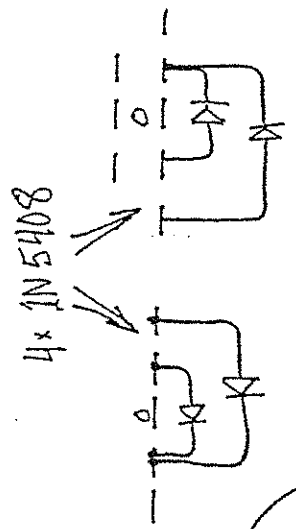
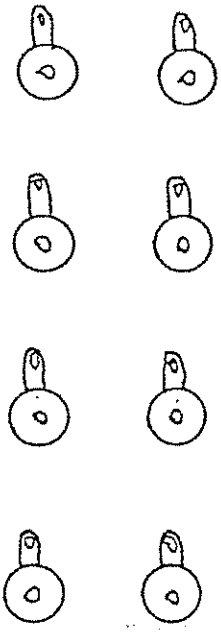
30k $\Omega$  2watt (orange,black,orange,gold)

- K6 to E2
- L6 to G2

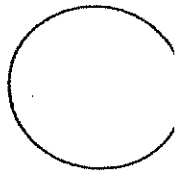
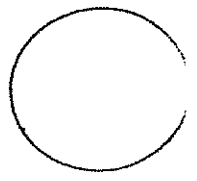
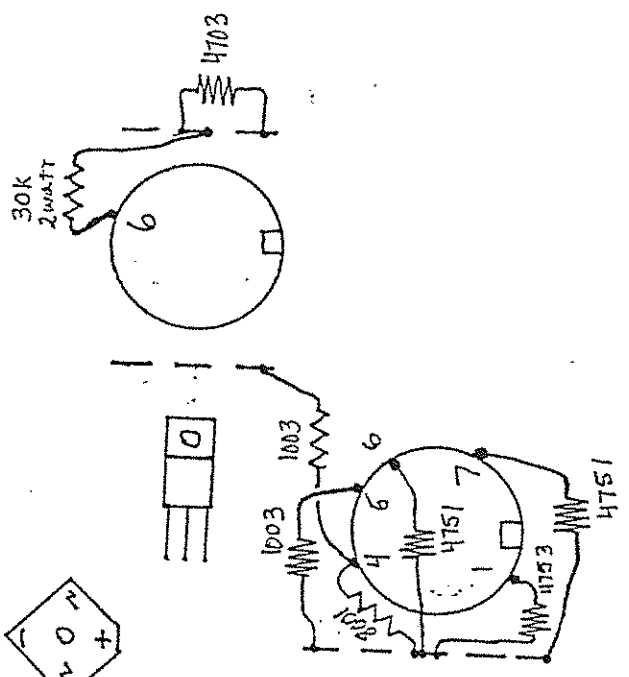
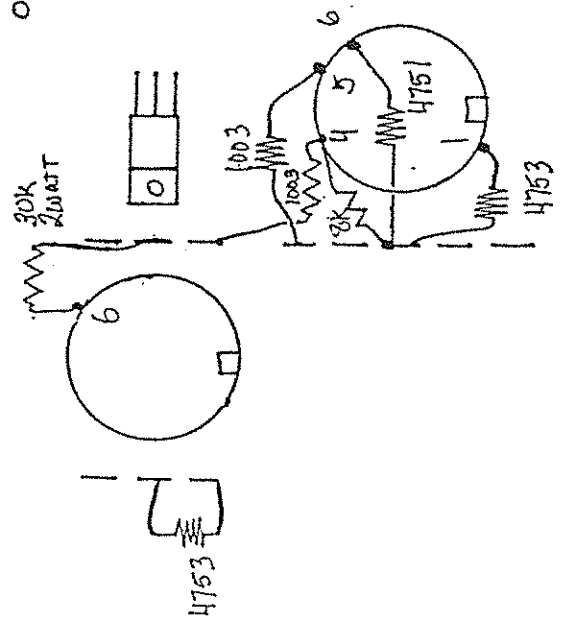
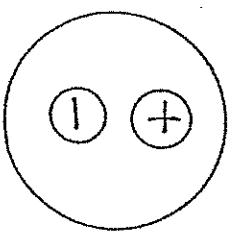
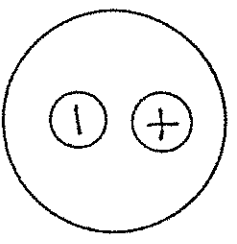
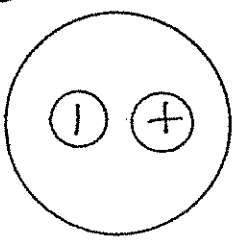
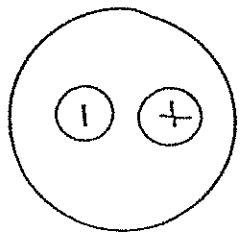
1N5408 Diodes (the stripe on the diodes corresponds to the vertical line at the end of the triangle in the symbol used below):

- A4  A2
- A5  A2
- C1  C4
- C2  C4





AE-1 3-17-94  
FINAL WIRE



**Power Transformer:**

**Secondary:**

- Greens to BR2(2 & 4)
- Reds to C1 & C2
- Red / Yellow to B3
- Yellows do not go anywhere. Cut them off and make sure that they cannot short on anything.

**Primary:**

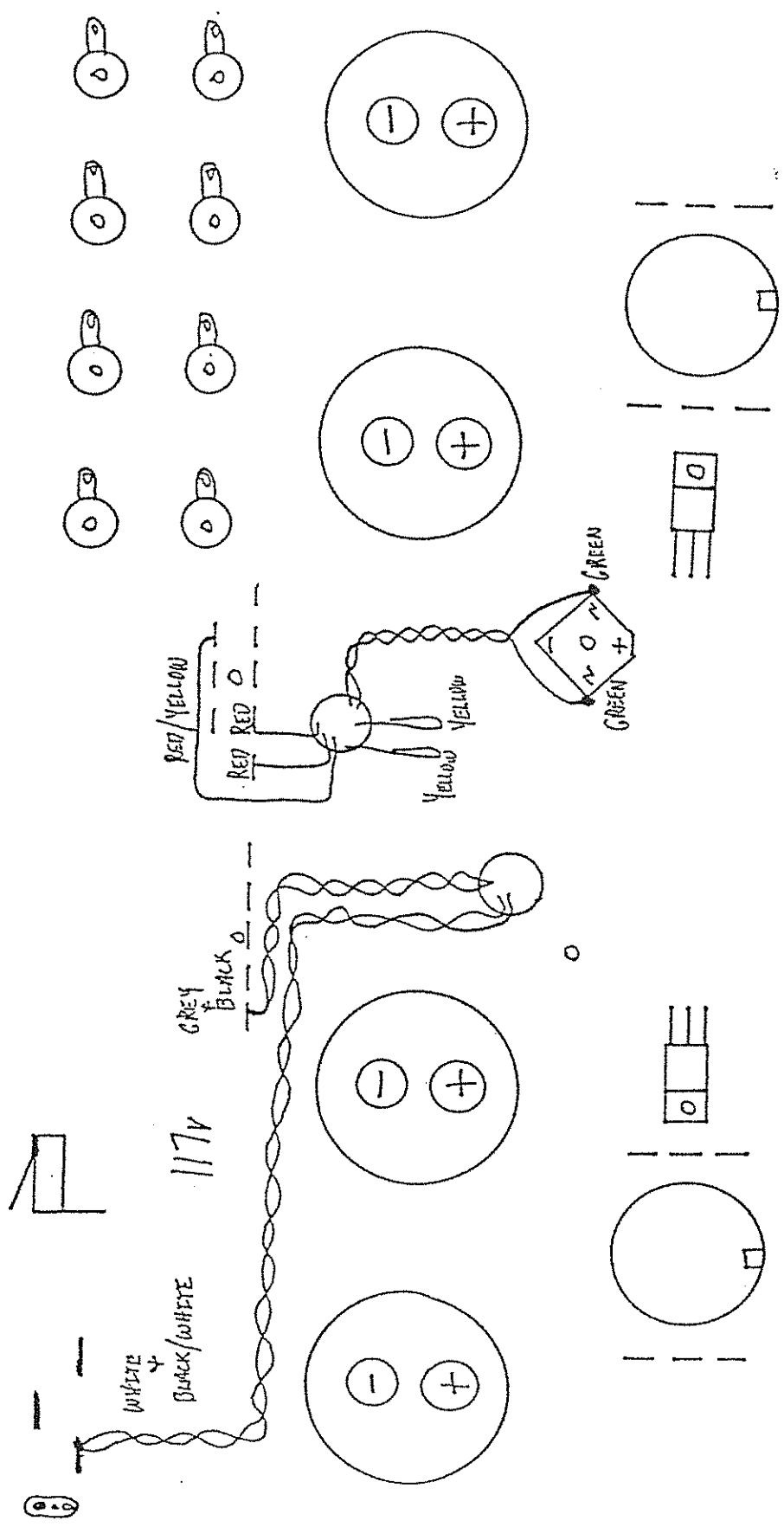
The instructions for wiring amplifier to be 110v or 120v are the same as for 117v below.  
The instructions for wiring amplifier to be 234v or 240v are the same as for 220v below.

**117v:**

- White & Black/White to AC connector (N)
- Black & Gray to A1

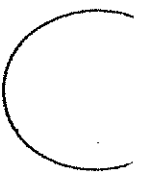
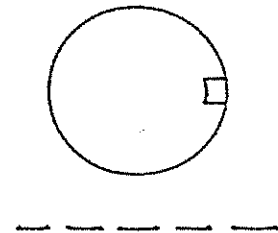
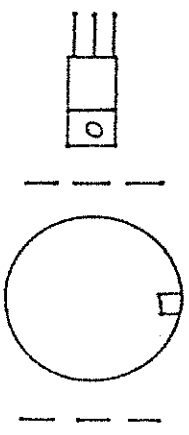
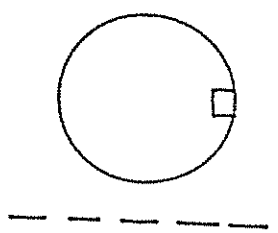
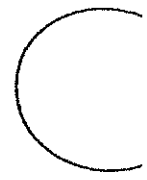
**220v:**

- White to AC connector (N)
- Black to A1
- Gray & Black/White to B1



AE-1 3-17-94  
TRANSFORMER

FOR 220V:  
LIFT THE GREY  
+  
BLACK/WHITE  
AND SOLDER THEM  
TOGETHER



## SOLDERING

Now that you have finished wiring your pre-amp, it is time to solder! This is what you have been waiting for. Make sure that the tip of the soldering iron is clean and has been tinned with some solder. It can be helpful to keep a wet sponge next to the iron while you are soldering in order to keep the tip clean. When soldering, you want to hold the iron on the solder joint long enough for the contacts to get hot. Then feed the solder slowly into the solder joint while keeping the iron in contact with it. Hold the iron on the joint until the solder flows and covers all of the wires and leads that are attached at the point. Be careful that you do not move the components while the solder is cooling or you may get a cold solder joint. You can recognize this if the joint has a crystalline or grainy texture to it (figure 1, below). A good solder joint should be smooth and shiny as well as giving the appearance of flowing out onto the contacts (figure 2, below). If the solder appears to be piled up on the joint as if it were a ball of mercury then not enough heat has been applied. In this case, reheat the joint with the iron and apply a little more solder until you have the desired effect.

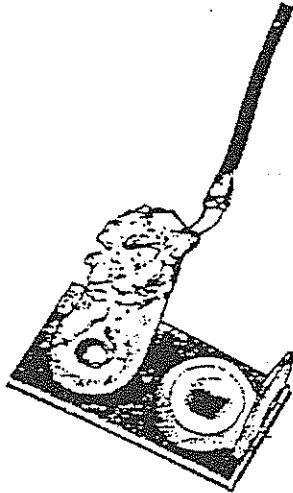


Figure 1

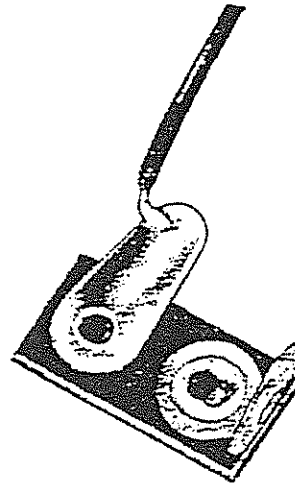


Figure 2

After you have soldered all of the connections. Be sure to take a few minutes (or as long as it takes) to check over the entire pre-amp and make sure that all of the wires are going to the right places and all of the connections are soldered. 99% of the problems that occur with any pre-amp are because of unsoldered joint and improperly placed wires.

## TESTING

After completing the assembly of your AE -1, you are ready to test. Please read through the entire procedure before operating your AE -1.

Do not plug in or turn on your AE -1 until the following check list has been completed.

- ( ) Check all capacitor polarities. An explosion will take place if not installed properly.
- ( ) Insert 2 amp Slo-Blo power fuse and turn the AC power switch to the operate (OPR) position (while the unit is unplugged). With an Ohm meter, make sure that point N & L on the AC power jack are not shorted to ground (GP1). Turn the AC switch to the off position.

Install the tubes now. Match the key on the base of the tube to the key on the tube socket for proper installation.

Connect the AE -1 to the proper line voltage. Turn the AC switch to the Stand-by (SBY) position

- ( ) Measure DC filament voltage across pins 7 & 8 of sockets K, L, M, & N.
  - The voltage should measure 6.0v  $\pm$  2v
- ( ) Turn the switch into the operate position.
- ( ) Measure the DC voltage across the 560 $\mu$ F 450v electrolytics (E2 & E3).
  - The voltage should measure 395v  $\pm$  5v
- ( ) Measure the DC voltage across the 560 $\mu$ F 450v electrolytics (E1 & E4).
  - The voltage should measure 335v  $\pm$  5v

If possible, connect a signal generator to the input of the AE -1 and use an oscilloscope to observe the signal at the output.

If the above test points check out, the unit should operate properly and should sound wonderful when installed in your system. If there is no sound, there is humming, or other problems exist, check the troubleshooting guide at the end of this section.

## TROUBLESHOOTING:

If there are any problems with your AE -1, please review the wiring diagrams and check for possible mistakes and unsoldered joints. All continuity tests must be done with the unit unplugged and all capacitors discharged.

- 1] AC fuse blows when put into operate mode:
  - Check B+ points for shorts to ground. The schematic will show all of the B+ points.
  - Make sure that diodes are installed correctly.
- 2] If there is no B+:
  - Make sure Red / Yellow center tap is connected to ground through a 1k $\Omega$  5watt resistor.
- 3] If there is no output.
  - Make sure the input selector switch is set for the proper input.
  - Use an oscilloscope and the schematic to trace the signal through the pre-amp.
- 4] If there is a loud hum in the speakers:
  - Check filament wiring for mistakes.
  - Possible ground loop: try floating the ground of the AE -1 or the amplifier that is being used (this can be accomplished by using an adapter for the AC power cord).

If you cannot get the unit to work properly, Audio Electronic Supply will service the unit for \$89.50 plus parts and shipping. Please package the unit so that it cannot move inside of the shipping container. AES or the shipping company will not be responsible for damage due to improper packing.

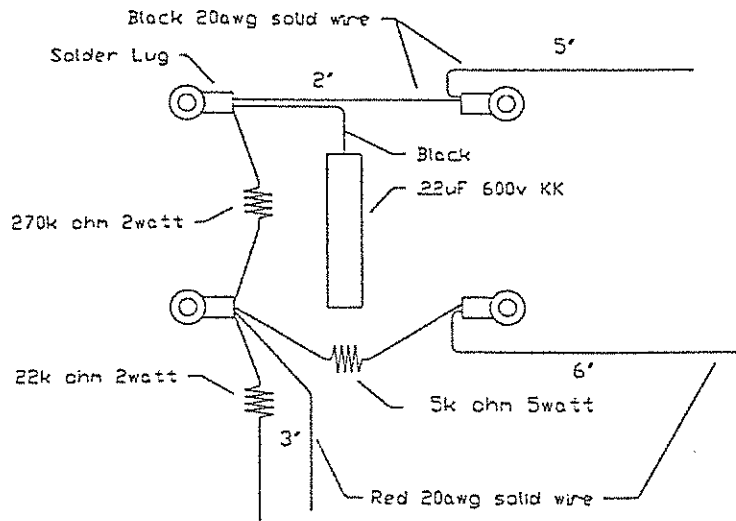
**SUBASSEMBLIES:**

Solder lugs can be crimped on the wires using a pair of heavy pliers. The lugs should then be soldered to ensure a good electrical connection.

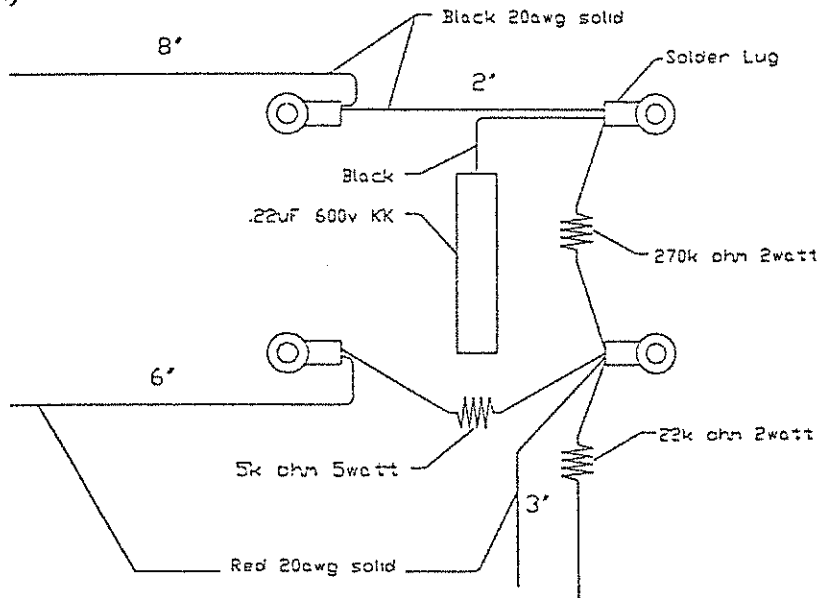
270k 2watt resistor have the color code (red,purple,yellow,gold).

Cut 1/2 of the black lead from the .22 cap.

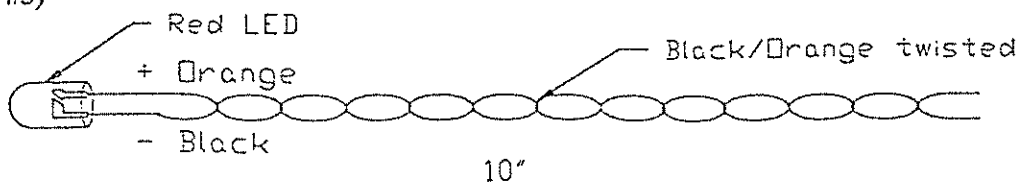
#1)



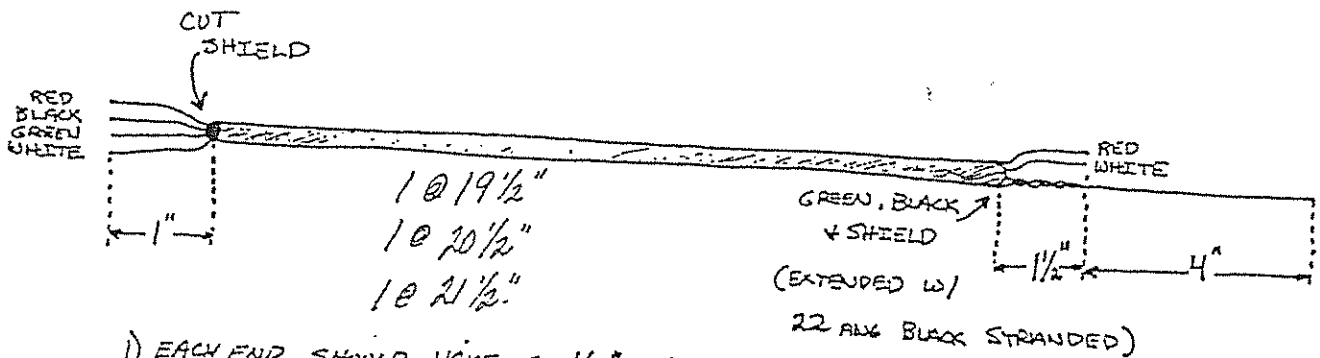
#2)



#3)



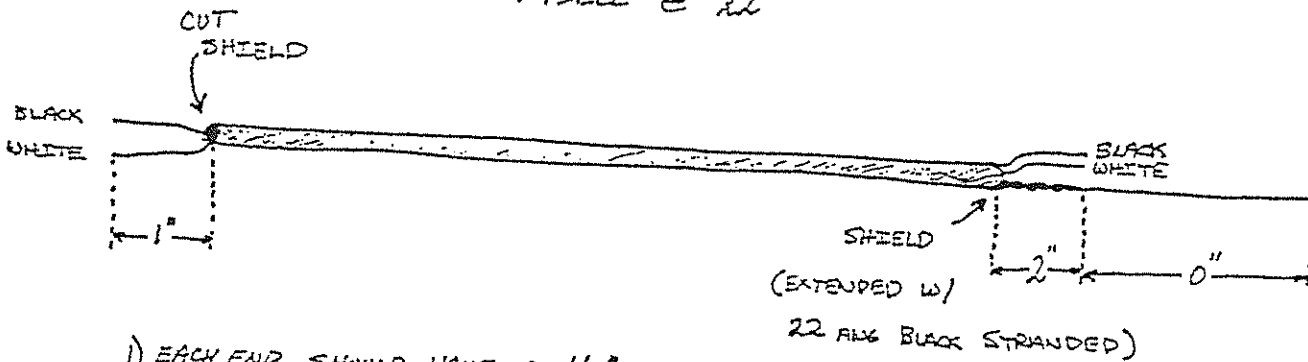
#4) 4 conductor gray cable:



1) EACH END SHOULD HAVE  $\approx 1/2$ " OF SHRINK TUBING TO COVER THE END OF THE GREY CABLE

#5) 2 conductor gray cable:

1 PIECE @ 22"

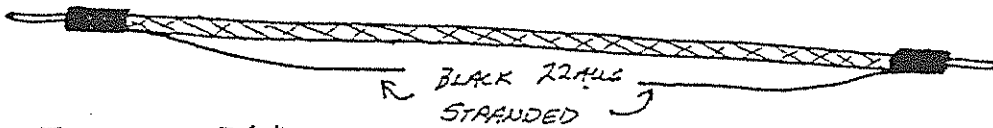


1) EACH END SHOULD HAVE  $\approx 1/2$ " OF SHRINK TUBING TO COVER THE END OF THE GREY CABLE

2) DO NOT EXTEND THE SHIELD

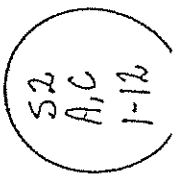
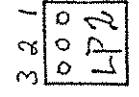
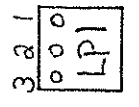
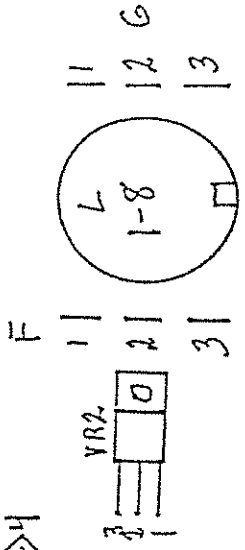
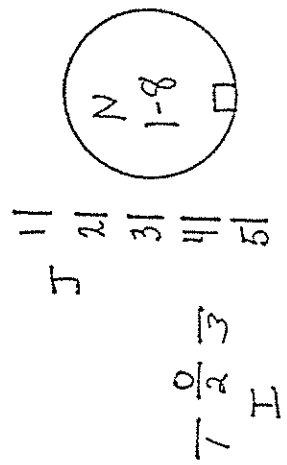
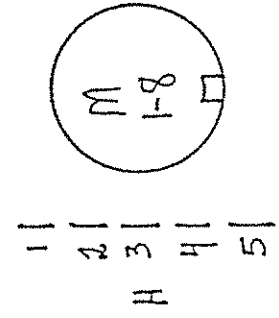
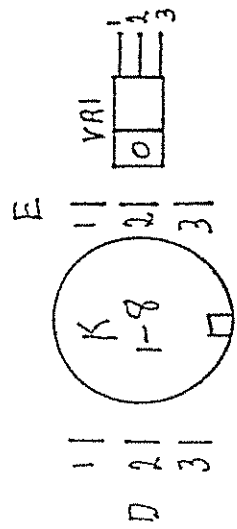
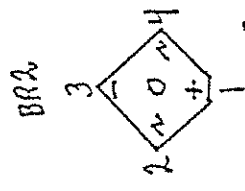
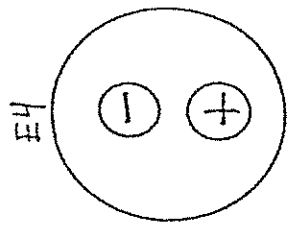
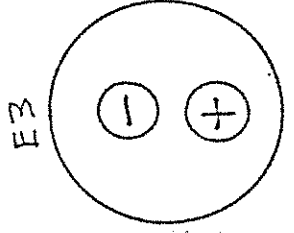
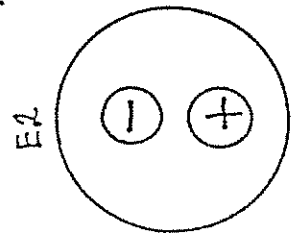
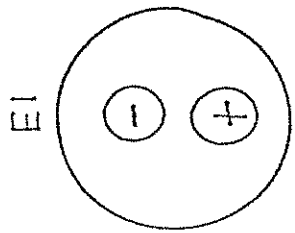
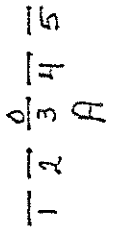
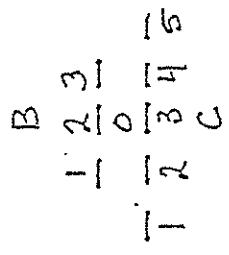
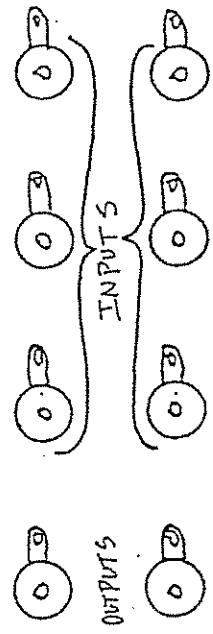
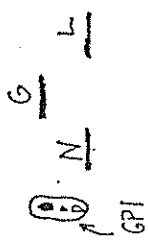
#6) Co-Axial cable:

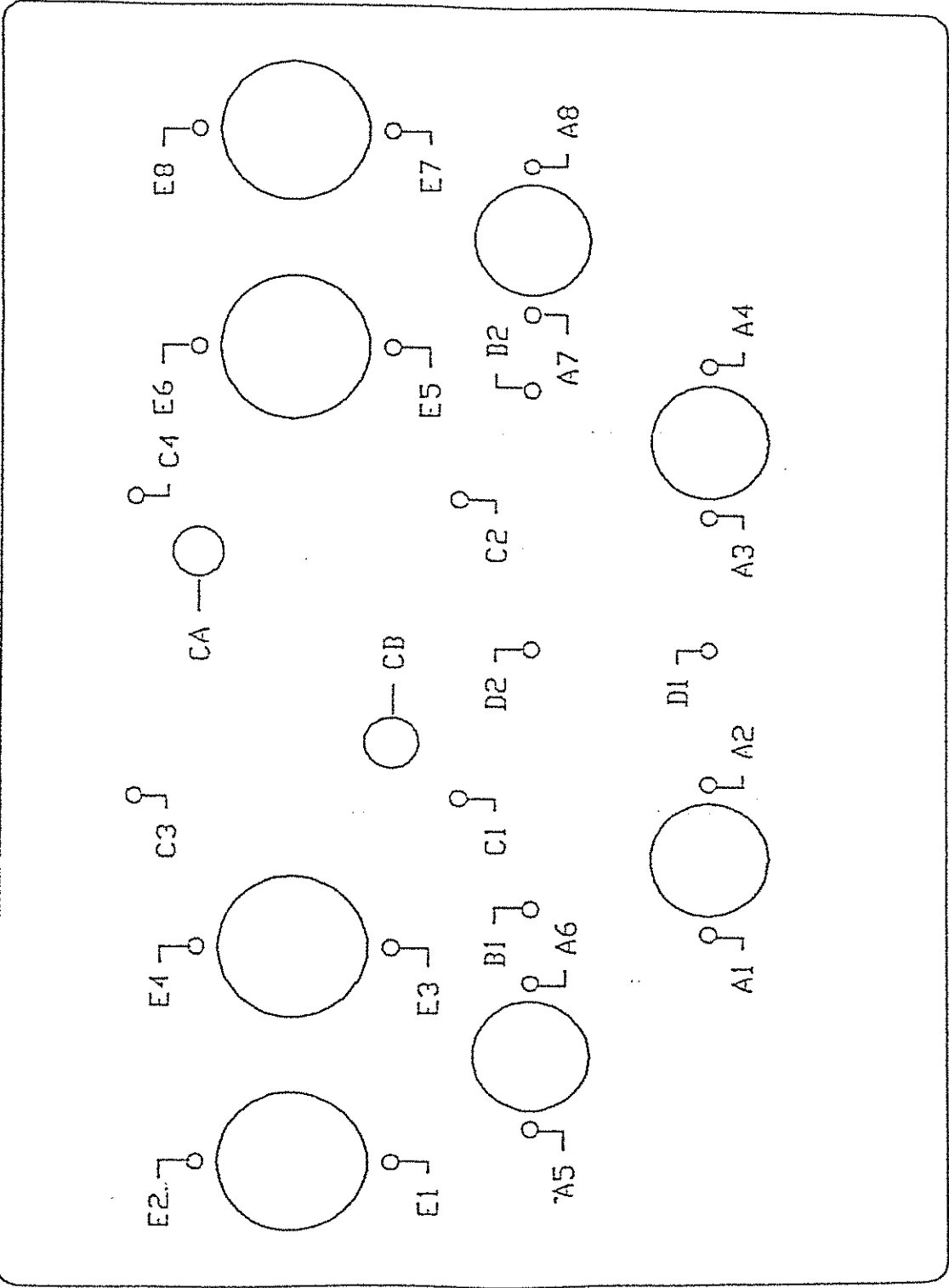
1 @ 11", 1 @ 15"

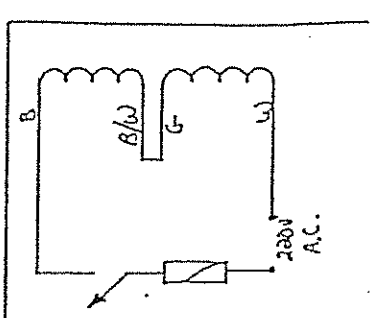
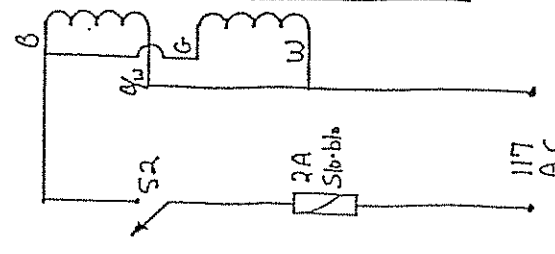
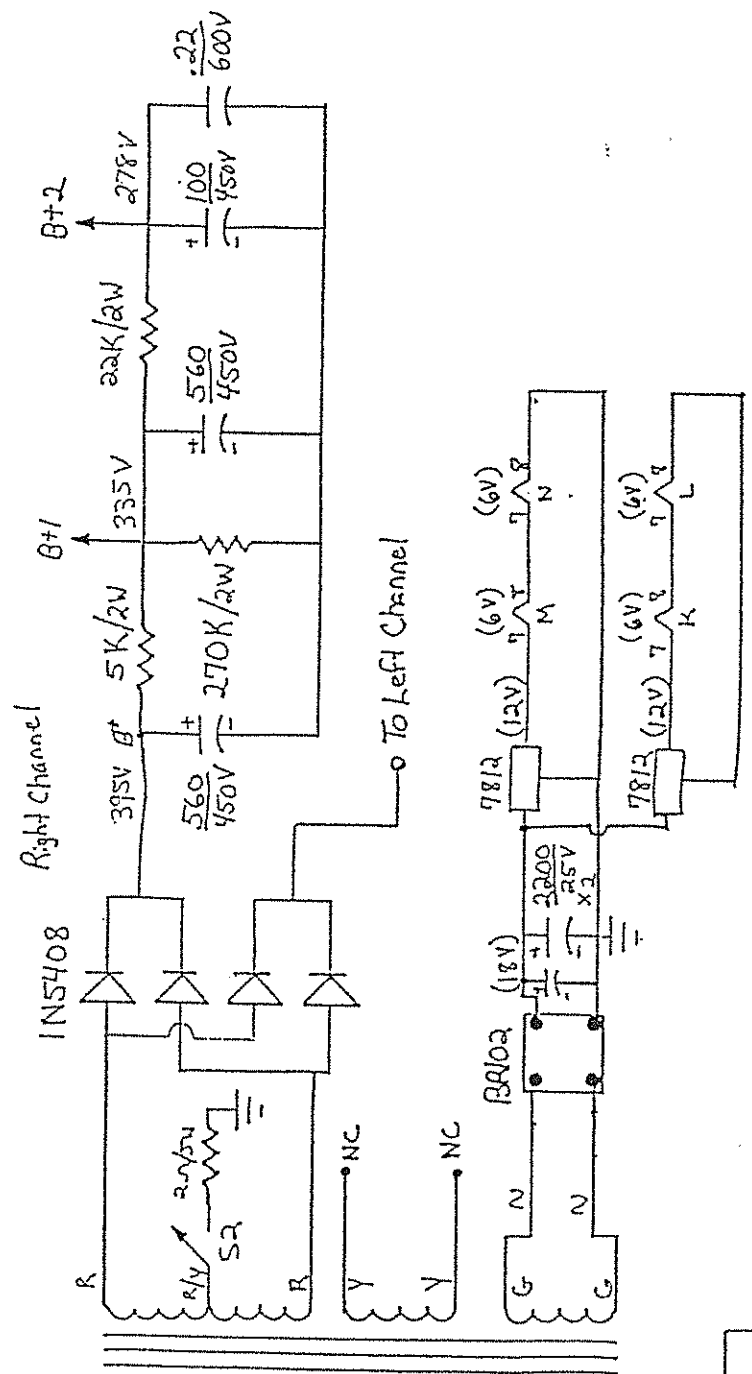


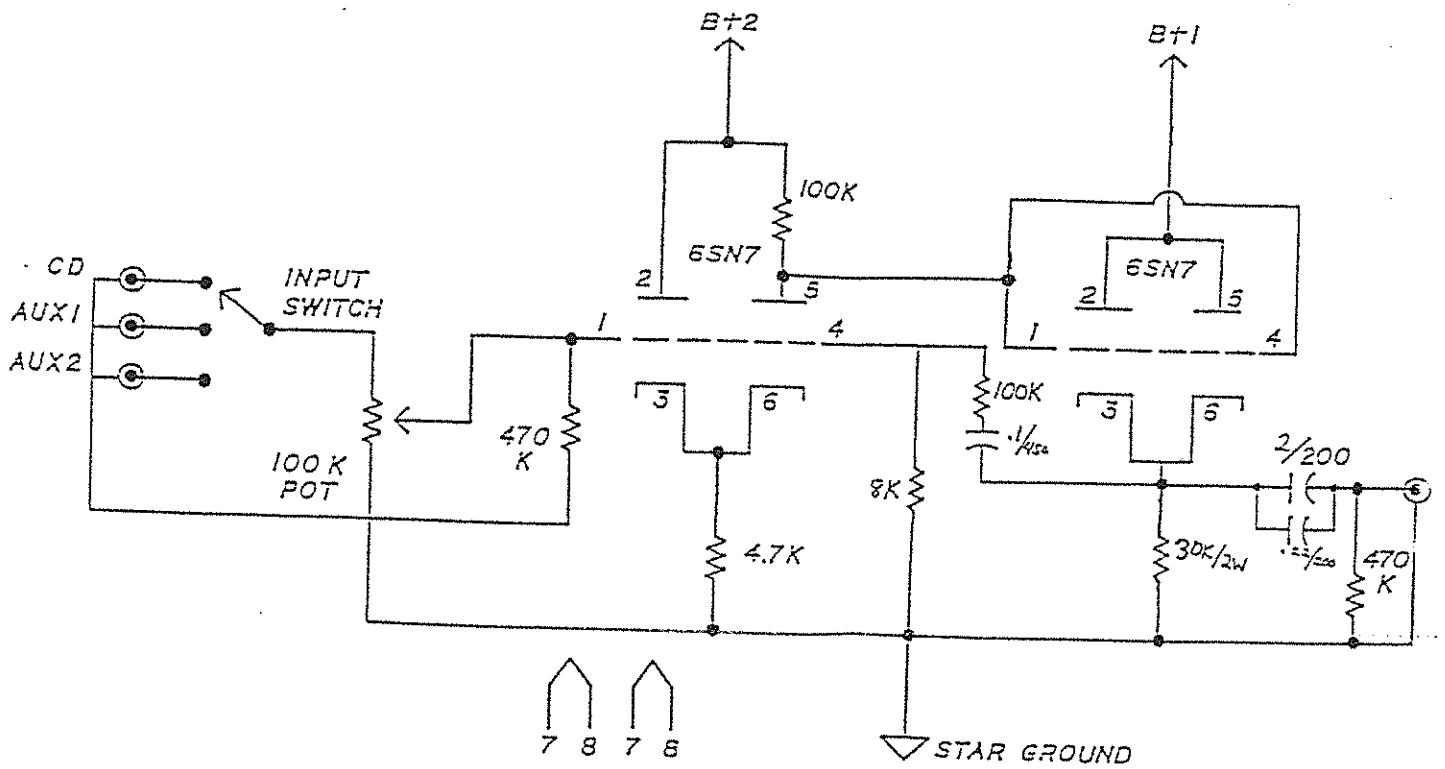
- 1] STRIP  $3/4$ " OF SHIELD INSULATION FROM EACH SIDE
- 2] STRIP OFF MOST OF SHIELD & TWIST AT BASE OF INSULATION
- 3] SOLDER 4" OF 22AWG BLACK STRANDED TO SHIELD
- 4] COVER SOLDER JOINT W/  $1/2$ " OF SHRINK TUBING











**Notes:**

**Notes:**

## UNITED STATES LIMITED WARRANTY

Audio Electronic Supply warrants to the original United States purchaser for use in the United States, that this product shall be free from defects in material (except tubes and AF output transistors) or workmanship for three (3) years from the date of the original purchase.

During the warranty period, Audio Electronic Supply will provide free of charge both parts (except tubes and AF output transistors) and labor necessary to correct defects in material or workmanship.

To obtain such warranty service, the original purchaser must:

- (1) Complete and send in the warranty Registration Card.
- (2) Notify Audio Electronic Supply as soon as possible after the discovery of a possible defect:
  - (a) The model number and serial number;
  - (b) The identity of the seller and the approximate date of purchase;
  - (c) A detailed description of the problem, including details on the electrical connection in the associated equipment and the list of such equipment.
- (3) Deliver the product to Audio Electronic Supply or the nearest authorized service facility, or ship the same in its original container or equivalent, fully insured and the shipping charges prepaid.

Correct maintenance, repair and use are important to obtain performance from this product. Therefore, carefully read the Instruction Manual. This warranty does not apply to any defect that Audio Electronic Supply in its sole discretion determines is due:

- (1) Improper maintenance or repair, including the installation of parts or accessories that does not conform to the quality and the specifications of the original parts.
- (2) Misuse, abuse, neglect or improper installation.
- (3) Accidental or incidental damage.

### WARRANTY DISCLAIMER

Except for the express warranties stated herein, Audio Electronic Supply disclaims all other warranties including, without limitation, all implied warranties of merchantability and fitness for a particular purpose.

### EXCLUSIVE REMEDY

Notwithstanding the foregoing, the purchaser's exclusive remedy for any breach of warranty, express or implied, is limited to the repair or replacement of the defective unit or the refund of the purchase price, at the option of Audio Electronic Supply. Under no circumstances is Audio Electronic Supply liable for incidental or consequential damages. Any implied warranties imposed by law terminate one (1) year from the date of purchase.

### FOREIGN PURCHASERS

Audio Electronic Supply warrants its merchandise to purchasers in the United States for use in the United States. It provides no other warranties. If you are a foreign purchaser, consult with your dealer to determine whether your dealer provides any warranty.

The foregoing constitutes Audio Electronic Supply's entire obligation with respect to this product, and the original purchaser and any user or owner shall have no other claim for incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation and exclusion may not apply to you.

This warranty gives legal rights and you may also have other rights which vary from state to state.



111 A Woodwinds Industrial Court., Cary, NC 27511