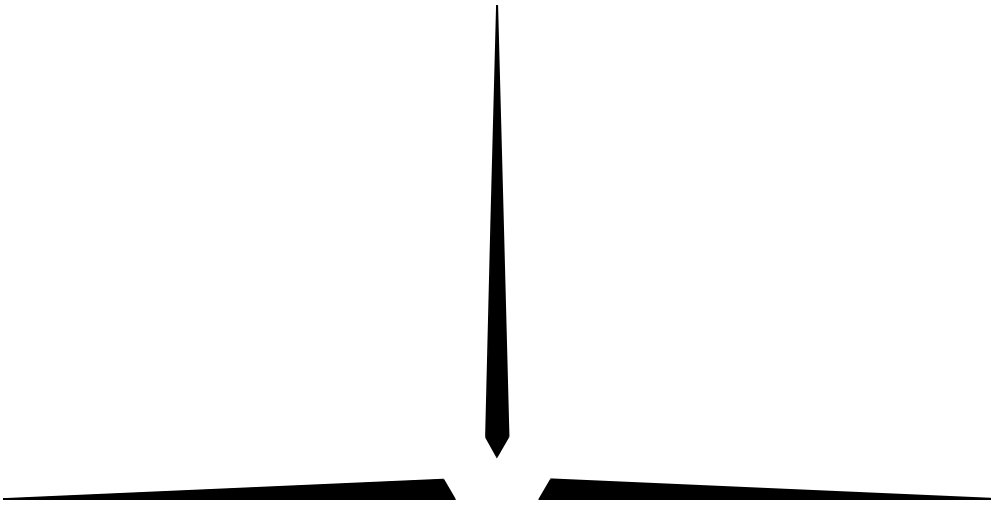


C·A·T

SL 1
Renaissance

Black Path

Owner's Manual

Table of Contents

Features:

Internal Switches	10
MC Transformer	3
High/Low gain	3
Optional XLR output	4
Optional XLR inputs	4
Tape In/Line 3	4
Tape Record/Normal	4
Mute/Operate	4
External Processor Loop	4
Auto Mute	4

How to Optimize your SL1:

The Tweaker's Rules	5
Grounding	5
Power Cords	5
Power Conditioners	6
AC Power Polarity	6
Mechanical Grounding	7
Analog Setup	7
Power Amplifiers	8
Break In	8
Warm Up	8
Contact Enhancers	8

Tubes:

Tube Life	9
Tube Noise	9
Tube and Socket care	9
Tube Dampers	9
Tube Layout	10

Power Supply Light Bulb 11

Warranty registration: 12

Repackaging Your SL1 13,14,15

MC TRANSFORMER

There are two switches on the circuit board close to the phono inputs which you can see on the Tube Layout page. Put the switches in the "MC" position to engage the transformers and in the "MM" position to disengage.

The SL1 has a unique low gain MC step up transformer. This transformer has only 11 dB of gain as opposed to the more usual 20 to 34 dB in most MC transformers. The SL1 is already known as having the quietest vacuum tube input phono stage and so it really doesn't NEED the traditional high gain transformers. Moreover, there are two good reasons in favor of a low gain transformer. The first reason is that a low gain transformer will have lower distortion and flatter frequency response. The second reason is that a low gain transformer will present a much higher load impedance to the cartridge. Certain cartridge brands are known to the audiophile community as being "unable" to drive an MC transformer. We have experimented with several such cartridges and find that not only can they "drive" the SL1 transformer, but they invariably sound better when the transformer is in use. We have further found that even many of the Japanese cartridges which have been specifically designed to have robust drive capability still sound better when driving our high impedance transformer.

We advise that the customer try the MC step up transformer, even if there is no obvious phono noise present. This will usually result in an increase in dynamic life (due to greater gain) and apparent increase in transparency (by allowing low level details to step clear of the noise floor).

HIGH/LOW LINE STAGE GAIN SELECTION

The line stage gain of all previous SL1 models has been 25 dB. The SL1 has switch selectable line stage gain, located on the circuit board near the volume control. The position marked "HIGH" will give 25 dB of gain. The "LOW" setting will give 15 dB of gain. Users with preamp related noise problems or excessive hard to control gain will find that the "LOW" gain position will sound quieter and a bit more transparent (again due to reduction in the noise floor). Users without noise problems will probably get better dynamics in the "HIGH" gain mode (again due to more gain). In most systems one way will be clearly preferable to the other. As a rule of thumb, if low level noise is clearly audible with the preamplifier's volume control turned all the way down, then use the low gain mode.

(WARNING: Do not change the gain setting while the preamplifier is on. The resulting BOOM could be deadly to your speakers, your power amplifier or your ears!!!)

XLR OUTPUT OPTION

This option provides an XLR and an RCA output instead of two RCA outputs. There is a switch on the main board which enables or disables the XLR output. You can see this switch on the "Tube Layout" page. This output option is highly recommended for dealer's demonstration units, and of course owners of balanced power amplifiers.

XLR INPUT OPTION

Optionally we can make Line 1 an XLR input, leaving Line 2 and Tape/Line 3 as RCAs.

TAPE INPUT/LINE 3

The TAPE INPUT/Line 3 input can be used for a conventional tape recorder or simply used as a third line input. When used as a line input there is no sonic penalty whatsoever.

RECORD/NORMAL SWITCH

The RECORD/NORMAL switch is used for making a tape recording. When the switch is placed in RECORD mode, the selected source is routed out to the tape recorder's input. When the NORMAL mode is selected, the connection to the tape deck is open and a recording cannot be made. When in NORMAL mode the sources do not have to drive the input of the tape deck which is most likely turned off. Therefore the source doesn't have to "see" the grossly non-linear load presented by an unpowered transistor input (such an input looks like diodes!).

EXTERNAL PROCESSOR LOOP

The tape loop can also be used as an external processor loop for devices which the user might wish to selectively disable or enable. The most common such device would be an external equalizer. Usually the device's input would be connected to the TAPE OUT and the device's output would be connected to the TAPE IN. Using the device would entail switching the TAPE IN switch up and switching the RECORD/NORMAL switch to RECORD. The EPL can be disabled by putting both switches back to their downward position.

MUTE SWITCH

To briefly mute the preamplifier, simply move the MUTE/OPERATE switch to the MUTE position. We do not recommend that this be done for long periods of time because the output tube is driving a dead short while the mute switch is engaged. This can shorten tube life.

AUTO MUTE

When the preamplifier is first turned on, the output will be muted for a couple of minutes to allow the operating voltages to stabilize.

OPTIMIZING YOUR CONVERGENT AUDIO SL1

Your decision to buy a CAT SL1 is an indication that you are a dedicated audiophile seeking the state of the art in music reproduction. This section of the manual is designed to assist you in realizing maximum performance from your SL1. Please consider the recommendations carefully.

THE TWEAKER'S RULES

The first, and most important, rule of the serious tweaker is too often ignored: "If you are unable (or too lazy) to evaluate the effect of the tweak DON'T DO IT!"

The second rule: "Just because a tweak is expensive doesn't mean it is better".

The third rule: "If someone else likes it in their system, that doesn't mean it will be good in your system"

GROUNDING

The **SL1** is <u>not</u> grounded to your AC wall outlet ground. We use the three-prong power cord only to help in achieving correct AC polarity (see below).

For best sound, the ground for the entire system should "float". That is, none of the components should be grounded to the AC wall outlet ground. All components which employ a three-prong AC cord with the ground prong connected to the electrical ground of the components are said to be "hard-grounded." Those components with two-prong AC cords are not hard-grounded.

A simple test reveals whether the component uses a hard-ground. With a Volt Ohmmeter (VOM), measure the impedance between one of the RCA connectors on the unit and the two prongs on the AC plug. A short here indicates that a hard-ground exists.

If a hard-ground is present, one may use a "cheater-plug" or "three-to-two" adapter to lift or float the ground of that component. Note: Be sure to check with the manufacturer to see whether it is safe to float their equipment. Some equipment has poor isolation from the AC power and may cause shocks if not grounded to the wall. In rare cases it will not be possible to float the system's ground without inducing hum. Here the system can be grounded by hard grounding <u>only</u> <u>one</u> component. The preamp is the most likely candidate due to its central position, electrically speaking. In this case it is best if one can hard ground the preamplifier to a really good ground. A cold water pipe is pretty good and a laboratory style true ground is even better.

SPECIAL POWER CORDS

We have evaluated many such devices over the years, finding various degrees of merit, and demerit.

In general we have found that the most "different" sounding cords are the worst. You want a musically authentic cord with clear tight, articulate bass, natural timbres and dynamics.

POWER CONDITIONERS

We have been very obsessive about power conditioning. CAT, in fact, was the first company to incorporate power conditioning into its products back before the first power conditioning units were even on the market. We have evaluated MANY such products over the years and whenever we heard an improvement we have tried to incorporate that technology into our product.

We advise the customer that there really is such a thing as "too much conditioning". All conditioners reduce bandwidth. This results in slower current delivery from the wall. The result of over-conditioning is to limit the current delivery resulting in problems such as dynamic compression and plump, poorly defined bass. Also, many power conditioners have problems such as poor focus and tizzy or etched highs with musically invalid "detail," but these problems are more related to bad components in the conditioner rather than the conditioning process itself.

When using an add-on conditioner with any CAT product, please remember that, due to the CAT's internal isolation transformers, this is like putting two external line conditioners in series with another company's products. This is a recipe for over-conditioning. Tweaker's Rules apply!

AC POWER POLARITY

Due to the asymmetrical winding of power transformers, and the single ended power provided to it, one side of the transformer's primary input will convey more 60Hz and RF noise to the component's ground. The **SL1** is wired for correct polarity when its AC cord is connected to a properly wired, grounded AC wall receptacle. If your outlets are of the two-prong variety, you will need to use a three-to-two adapter, and then check for correct polarity.

To check for correct AC polarity, perform the following test. Disconnect all equipment from the preamplifier. With the preamp on, measure the AC voltage between the ground post on the rear of the **SL1** and a true ground.[1] Next, reverse the AC plug and measure again. The plug position giving the lowest reading indicates correct polarity. Use the same method to check each component in the system, remembering to disconnect the unit from the rest of the system first. Note: Occasionally a component will sound best when connected out of polarity. This is because the test procedure outlined above reveals the orientation which produces the lowest 60 Hz noise. This alignment is usually, but not always, the orientation that produces the least RF noise. Since RF noise is the most important factor, listening trials are always the best method to use. Listen for the orientation that produces the cleanest sound and greatest quiet and space between instruments.

[1]A cold water pipe is normally the best accessible true ground. As an alternative, one may simply hold the lead between the fingers, using our body as a ground reference.

MECHANICAL GROUNDING

The **SL1** should be placed on a rigid, non-resonant platform. A number of good equipment stands are available from manufacturers such as Arcici, Sound Anchors and others. Many of these designs may be filled with sand or lead shot to further increase mass and damp resonance.

The **SL1** comes equipped with visco-elastic decoupling feet that significantly reduce the effects of structure-borne vibrations. These special feet are VERY good, and quite expensive. We provide them as a "final solution" so that our customers don't have to address this situation. Feel free to experiment with alternatives, but remember the tweaker's rule and listen carefully. You will not find a better foot!

OPTIMIZING CD SETUP

The AC polarity of your CD player is important and should be determined as previously described. Always use the fixed outputs of your CD player or digital to analog converter. If only variable outputs are available, full clockwise rotation of the level control is necessary to lessen the degradation introduced by the poor quality potentiometer common in this application.

OPTIMIZING TURNTABLE/CARTRIDGE SET UP

Making the necessary adjustments for VTA, VTF, azimuth, overhang and anti-skating requires a knowledgeable dealer. All CAT dealers should be able to perform these for you.

The **SL1** is supplied with cartridge loading plugs in a variety of impedances. These plugs, inserted into the extra pair of phono inputs, load the cartridge with the impedance listed on each. If no plugs are installed, the default load impedance is a very high 8K ohms which sounds like "no loading" at all. This impedance will be correct for most phono cartridges. Please try this first, even if you used a different load with your previous preamplifier. The optimum cartridge load for the **SL1** may not be the same as required with other units.

Hum is a common problem associated with turntable use. Proper connection and grounding should eliminate this problem. Since some turntables are particularly sensitive to AC polarity, it is a good idea to check for the best orientation. Disconnect the turntable/tonearm ground wire from the preamp, then listen for which AC plug orientation produces the least hum. Both the turntable and the tonearm should be grounded to the appropriate post on the rear of the **SL1**.

For lowest RF pickup, orient the tonearm leads so that the shield end is connected to the preamp. Those tonearm interconnects which have separate drain wires are preferred, as they help to further reduce the negative effects of RF. Always connect the drain wire to the grounding post.

Note: When the turntable is in use, be sure that all other source components (especially CD players) are turned off!!

OPTIMIZING POWER AMP INPUTS

If your power amplifier has input level controls, these should be used fully clockwise, for the reasons described above. When using amplifiers with balanced inputs, the negative leg of the balanced input should be shorted to ground. This prevents hum and noise problems caused by the floating inputs. While most amplifiers with balanced inputs provide a switch for this purpose, inserting a jumper in the XLR connector will accomplish the task. Alternately, an XLR connector can be prepared with this jumper soldered internally, and the connector then inserted into the XLR jack.

If your SL1 is equipped with XLR outputs, these will possibly sound better yet, depending on the amplifier used and how good its CMRR (Common Mode Rejection Ratio) is. Paradoxically, to the non-technically inclined at least, the better balanced such an amplifier is, the less it needs a balanced anti-phase drive.

BREAK-IN

All audio components will improve over the first few hours of use. Your **SL1** is no exception. Please note that for break-in to occur, one must play music through the preamplifier. Simply leaving the unit turned on, with no signal present, will do little to hasten break-in.

Another aspect of break-in is caused by the repeated thermal cycling of turning the unit on for an hour or so and then turning it off for several hours allowing it to cool slowly back to room temperature. This aspect of break-in cannot be hastened. Normal use is the only way to get it done.

WARM UP

After the **SL1** has completed the break-in regime, a short fifteen to twenty minute warm-up is all that is needed to prepare the unit for serious audition. Static warm-up does not work for the SL1! Music must be playing at normal listening levels for the SL1 to warm up. This warm-up period is important for the other components in the system as well, as each requires a few minutes of playing time to sound its best. Unlike CAT products, some other company's products, especially solid-state electronics, do benefit from static warm up. If you have such a product you give it a static warm-up PRIOR to turning on your SL1.

CONTACT ENHANCEMENT

Please don't use contact enhancers on your SL1. These will gum up your contacts and make them work worse and worse with each use. Use fine grit sandpaper if needed.

TUBE LIFE EXPECTANCY

Tubes are most likely to fail during their initial break-in period of about three to four weeks. After the break-in is complete and the "infant mortality" period has passed, most tubes will stabilize for several thousand hours of operation. Tube life can be foreshortened if the tube is subjected to mechanical trauma, such as being dropped.

While tubes may continue to perform for many years, we recommend replacing the tubes after 2000 hours of operation, about two or three years for most listeners. Of course, if the preamp is left on continuously, the chronological span is greatly reduced.

TUBE NOISE PROBLEMS

If the preamp exhibits excessive noise with the volume control set to minimum, the problem most likely lies with one of the line input tubes, V6 (left) or V7 (right). On rare occasion, the 12AX7s in the line stage (V8 left & V9 right) can cause noise.

If noise is present only on phono playback, the culprit will be either V1 (right) or V2 (left). Phono noise will be affected by volume and balance controls.

The **SL1** uses two types of tubes, each chosen for its superiority of function in this specific design. Both types are very common and should be readily available for decades to come. In fact, there is a greater variety of tubes available today than ever before. (Please note: Previous SL1s use three tube types. The 12AU7 was used as the line input tubes)

We provide the most accurate tubes ever made for use in the **SL1**, however, we know that some of you cannot resist the temptation to experiment with other brands. Feel free to do so, but remember the "Tweaker's Rules"

NEVER REMOVE THE TOP COVER OF THE **SL1** BEFORE UNPLUGGING THE UNIT FROM THE WALL! Removing a tube from its socket while power is on <u>will</u> damage the solid-state devices in the power supply. This type of damage is considered abuse and <u>is not</u> covered under warranty.

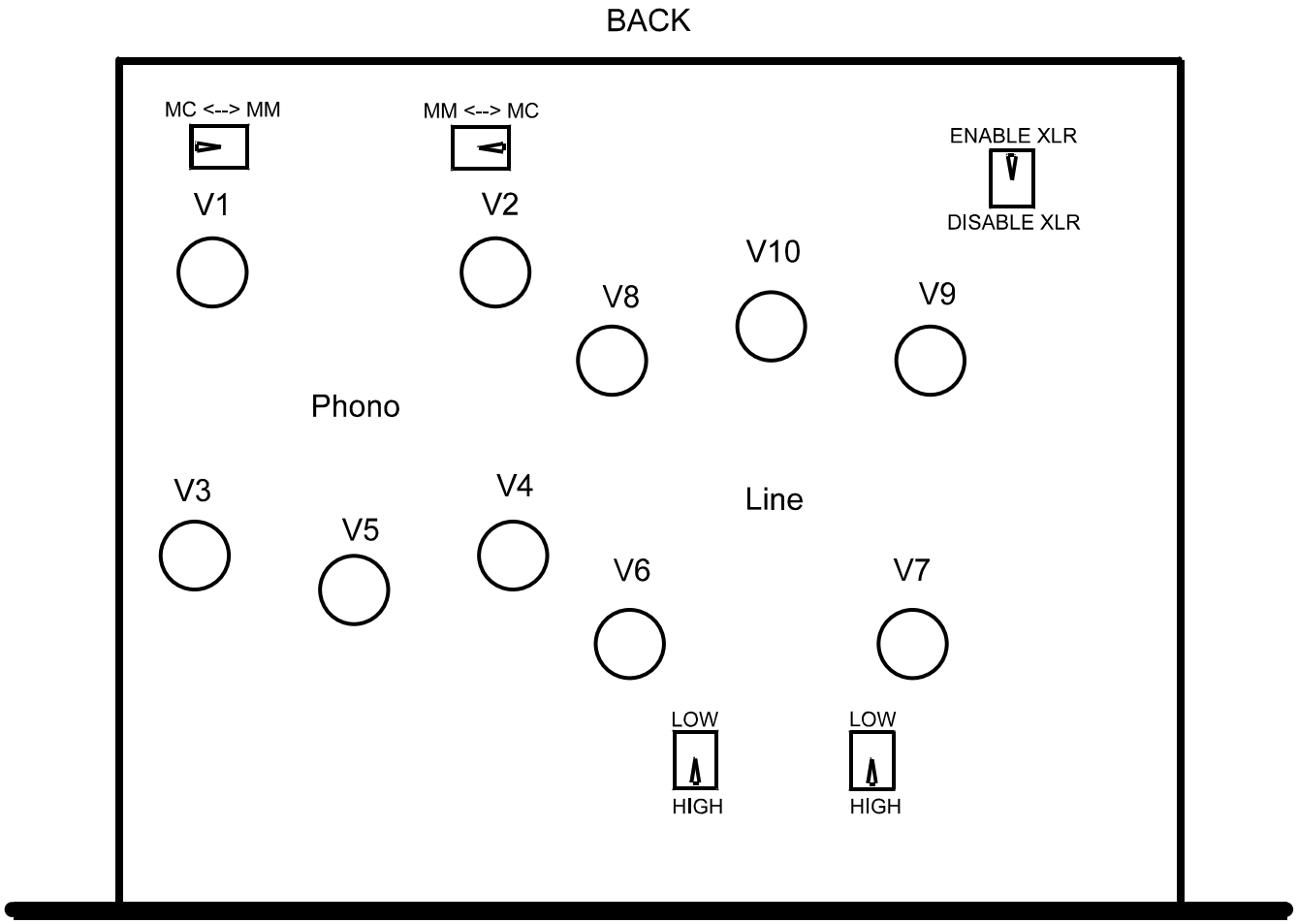
TUBE AND SOCKET CONTACTS

<u>Please do not use any contact enhancers on your tubes or the sockets.</u> These enhancers leave behind a residue which builds up with each application making the contact worse and worse.
If you have already used such an enhancer, or if your tube pins do have serious corrosion, use a fine grit sand paper to clean the contact.

TUBE DAMPER RINGS

Don't use them.

Layout for Tubes
and Internal Switches



V1	Right Phono Input 6922/6DJ8
V2	Left Phono Input
V3	Right Phono Gain 12AX7/ECC83
V4	Left Phono Gain
V5	Phono Cathode Follower 6922/6DJ8
V6	Left Line Input 6922/6DJ8
V7	Right Line Input
V8	Left Line Gain 12AX7/ECC83
V9	Right Line Gain
V10	Line Cathode Follower 6922/6DJ8

HOW TO REPLACE THE LIGHT BULB IN YOUR SL1 POWER SUPPLY

Unplug your SL1 first!

DO NOT OPEN THE POWER SUPPLY BOX!!

The push button for power has a thumb groove in its top edge. (The button must be in its out/off position for this to be visible). Put your thumb into this groove and gently but firmly pop the plastic button out of the switch. Inside you will see the top of the bulb in the topmost of two holes. (The bottom one is not used). To the left is a flat metal extraction bar. Pull the extraction bar straight out, the bulb will pop out. Now put the new bulb in the hole and push it in. Replace the button, pushing it in so that the button is flat with the external black bezel when the switch is in the fully pushed in/on position. Now plug in your SL1.

WARRANTY

Your **SL1** is warranted for six months from date of purchase. The warranty will be extended to three years with the return of the completed warranty registration form within 30 days of purchase. Be sure to include a copy of the sales receipt to validate your registration. Tubes carry a ninety day warranty.

WARRANTY REGISTRATION FORM

Name:_____

Address:_____

City:_____**State**:_____**Zip**:_____

Phone:_____ **E-Mail:** _____

Serial Number: _____ **Purchase Date**: _____

Dealer: _____

What Hi Fi Magazines Do You Read?

_____

Other Components in Your System:

THANK YOU!

REPACKAGING YOUR SL1

Foam Packaging consists of the following:

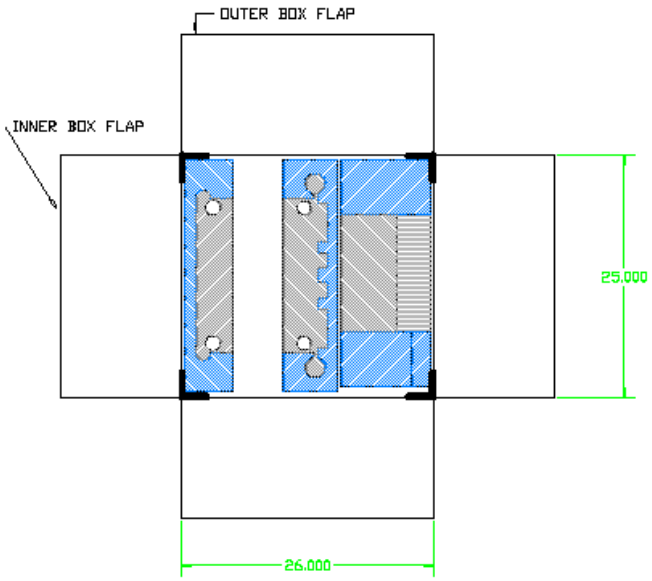
Two (2) SL1 face plate foam caps - 1 under, 1 over

Two (2) SL1 back panel foam caps - 1 under, 1 over

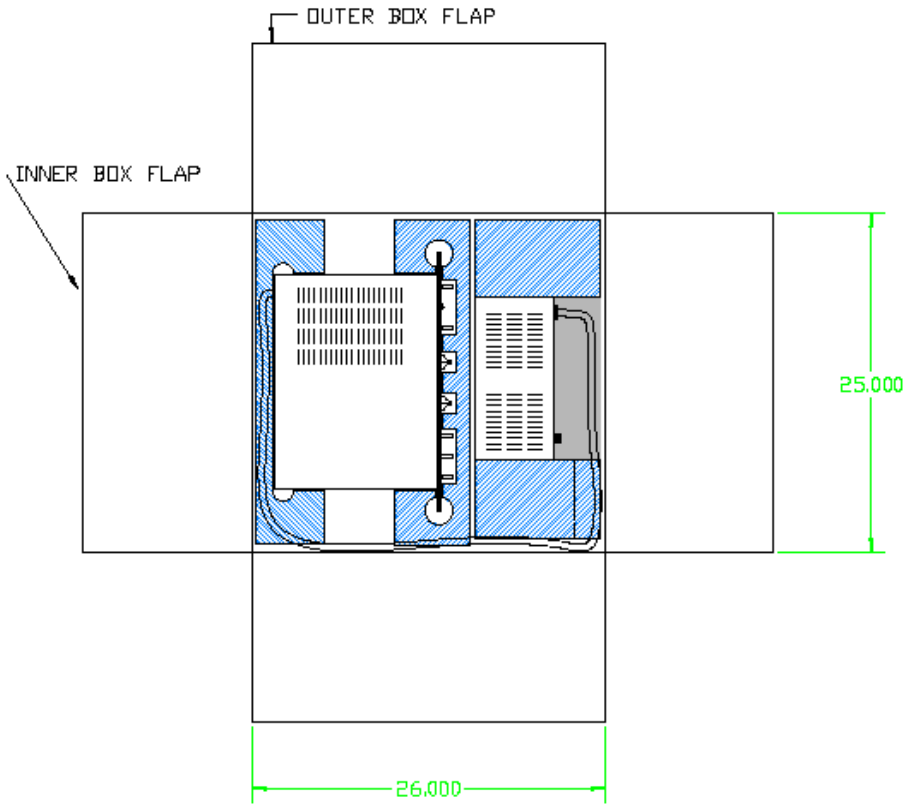
Two (2) Power Supply foam caps - 1 under, 1 over

Four (4) corner pieces

STEP 1 : Put bottom layers of foam into empty box. Insert corner pieces.



STEP 2 : Place SL1 and power supply into box.
See diagram.



STEP 3 : Place foam caps on top of SL1 and power supply