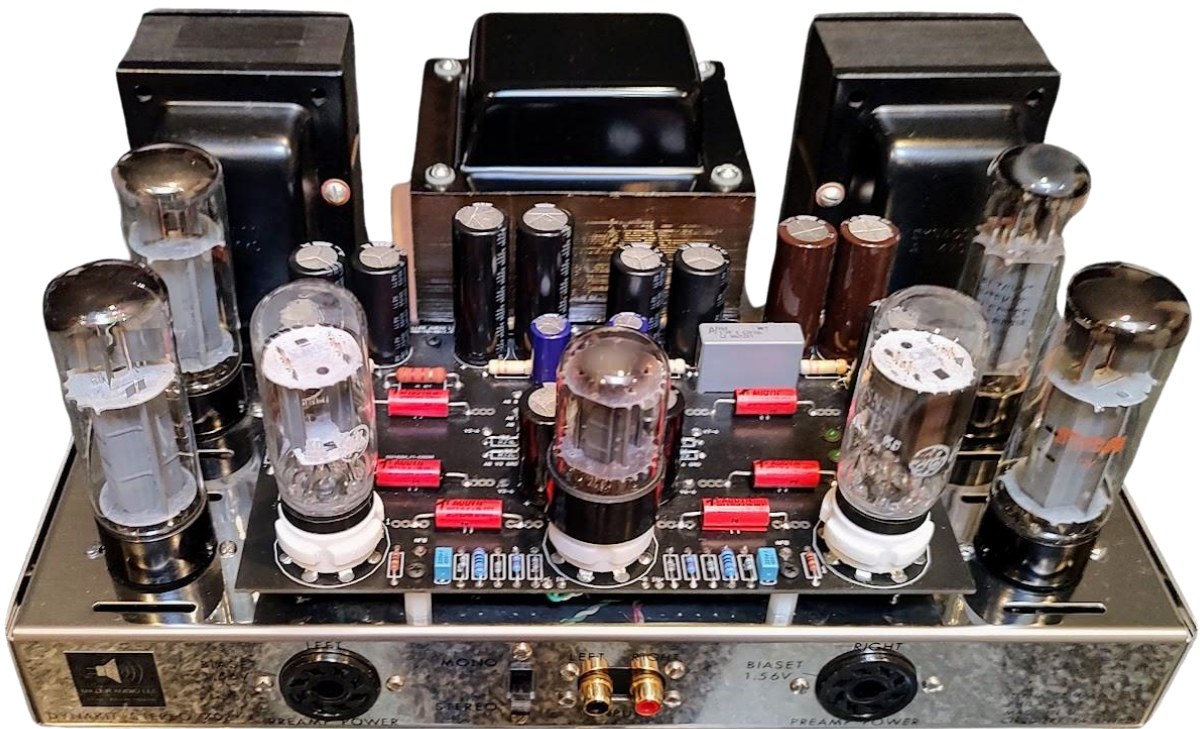
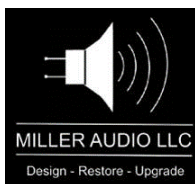


# Owner's Manual



# DYNA-70 Ultimate ST-70 Amplifier

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Miller Audio LLC  
January 2024



## **OWNER'S MANUAL**

### **For All DYNA-70 Ultimate Upgrade ST-70 Amplifiers**

#### **A. INTRODUCTION**

Thank you for your purchase of our DYNA-70 “Ultimate” ST-70 upgrade audio system. The DYNA-70 Ultimate Upgrade will radically improve how your stock ST-70 sounds. In bringing this Made in U.S.A. classic tube amplifier up to modern 21<sup>st</sup> Century standards, we reward you with an amazing listening experience!

We understand you are excited to install & listen to your new DYNA-70 equipped amplifier. However, there are several tips and safety items you should review prior to using your DYNA-70 upgraded ST-70. We suggest you take a few minutes and review the information in this Owner’s Manual to ensure your first set-up and use goes smoothly and trouble free.

#### **Power Tubes- 6CA7 / EL-34 / KT-77**

The DYNA-70 Ultimate Upgrade is based on the 6CA7 / EL-34 power tube. If you have a good set of 6CA7 / EL-34 tubes in your original ST-70, they will work fine with the DYNA-70 Ultimate Upgrade. We recommend that you stay within the 6CA7 / EL-34 tube group. The B+, Cathode and Plate voltage levels in our driver circuit are optimized to suit 6CA7/EL-34/KT-77 tubes. We DO NOT endorse use of other tube types (6L6, KT-66, KT- 88, etc.) with the DYNA-70 Ultimate Upgrade system. Use of any other tubes will void your warranty, including the Auto Bias Module Warranty, if so equipped.

#### **Preamplifier Tubes- 6SN7-GTA or GTB**

For the best performance and sound quality, we recommend use of 6SN7-GTA or 6SN7-GTB New Old Stock (NOS) versions of the 6SN7 tube. The 6SN7 tube was improved during the early ‘50’s for television use and the best tubes are the later 6SN7-GTA/B versions of the tube. Earlier 6SN7-GT or just “6SN7” tubes will not work in your DYNA-70 Upgrade amplifier- **DO NOT USE** them. Likewise, we can recommend JJ, Tung-Sol, Gold Lion and Sovtek tubes for New Production tubes. Miller Audio LLC carries a complete line of NOS and New Production tubes for your DYNA-70 Ultimate Upgrade; we would be happy to assist you in selection of tubes for the best sound from your system as well as fitting within your budget.

**NOTE:** With the DYNA-70 Ultimate Upgrade system we have integrated a modern, solid-state rectifier in the DYNA-70 CCA, eliminating the rectifier tube. This is one less tube to worry about and the 5-Volt AC filament winding for the rectifier tube is not used with our upgrade, providing a modest load reduction on the PA-060 power supply transformer; it will operate cooler than earlier, short-height versions of PA-060 Power Transformer.

Finally, we use quality, name brand components from manufacturers such as Nichicon, United ChemCon, Panasonic, Texas Instruments, Wima, Solen and Audyn. We source our parts from Mouser, Digi-Key, Newark, CE Distribution, Dynakit Parts and other reputable U.S.A. based suppliers; you can trust all components are genuine and not cheap, counterfeit parts.

## **B. ABOUT THIS MANUAL**

This manual provides information necessary to operate and maintain the Miller Audio LLC DYNA-70 Ultimate Upgrade audio system. We recommend that you also have available the original Dynaco ST-70 Assembly Manual for reference. Visit our website at: <https://milleraudiollc.com/documents/> if you need to download a copy of this Owner's Manual or the original Dynaco ST-70 Assembly Manual.

Regardless of whether you purchased a newly built ST-70 amplifier from Miller Audio LLC with the DYNA-70 Upgrade system already integrated, or you purchased one of our DYNA-70 Ultimate Upgrade Kits with either a Manual or Automatic Bias capability, this Owner's Manual applies to all versions and iterations of the DYNA-70 Ultimate Upgrade Audio System as used in an *original* Dynaco ST-70. This also includes previous versions initially sold by Erhard Audio some 5-7 years ago (2017-2020 period).

**NOTE:** The Miller Audio LLC DYNA-70 Ultimate Upgrade system is only suitable for use with an *original* Dynaco ST-70 (aka "ST-70 Series I"). It will not work in a ST-70 Series II amplifier (made by Panor / Sound Valves ), or in an ST-70 Series III amplifier (made by Radial Engineering Ltd.). Both these amplifiers have been discontinued and are no longer in production. However, the Series I is the *original* Dynaco ST-70, and these amplifiers are still produced today by several sources, including Miller Audio LLC.

## **C. SAFETY**

Here are a few safety tips one should observe when using and operating Tube Amplifiers. **ALWAYS** pay attention to and follow these guidelines - it could save your life or someone else's.

- **Never** work around your amplifier & audio system alone; if you were to receive an electrical shock, having someone to call 911, or get you to a hospital, could save your life.
- **Never** move or transport the amplifier without the tube cage attached- this will protect the vacuum tubes, tube pins, and sockets.
- **Always** handle the amplifier with the heavy side of amplifier (i.e., the back side or Transformer-side) with the transformers towards your body; this puts the heaviest side of the amplifier nearest you.
- **Never** move an amplifier that is still hot or warm; turn it off, unplug it, and let it discharge the power circuits and cool before moving.
- We recommend that you leave the Tube Cage attached and on the amplifier; this protects your tubes, as well as prevent burns to children or pets.
- Keep the amplifier away from children, pets, and flammable objects and materials (drapes, window shears, paperback books, newspapers).
- **Always** provide about 1 foot / 12 inches / 30+ cm of air space around the amplifier (top, back and Left & Right sides) for proper air circulation and cooling air currents.
- **Always** use an Earth-grounded, 3-Wire electrical power outlet.
- **Never** use a 2-prong "Ground Cheater Adapter" Plug on the 3-wire power cord.
- **Never** touch hot tubes, and **Never** remove tubes from a live / active amplifier (aka "Hot Swapping" of tubes).
- **Never** touch components on the DYNA-70 Upgrade circuit card while it is powered on; always allow 15-20 minutes for the capacitors on the circuit card to discharge before changing or swapping tubes.
- **Never** work around, or on your audio system when distracted or while talking to someone, or on the phone - **Stay Focused** or stop until you can focus.
- **Always** remove all jewelry, watches, and rings when working around or on your audio system; gold & silver are *extremely good* electrical conductors.
- **Never** work around your audio system when small children or pets are present.

- **Never** assume the power is off by turning the Power Switch off; to ensure there is no power to your amp, **UNPLUG IT!**
- **Always** have a spare 3-Amp Slo-Blo fuse handy and **Never** use a larger amperage fuse or attempt to bypass the fuse with a wire or aluminum foil; best case is you will do severe damage to your ST-70 and worst case you could burn your house down.

#### **D. WARRANTY**

Miller Audio LLC will provide Warranty Service to the original owner on products sold new in the United States for the lesser period of 1 year from the date of purchase by the original purchaser, or 2 years from the date of shipment to an authorized Miller Audio LLC dealer. During the warranty period Miller Audio LLC will repair defective units without charge for labor or parts (The Warranty does not apply to consumable parts such as Vacuum Tubes & Fuses).

Fuses are not warranted; they are a necessary protection device that is meant to fail to protect the amplifier as well as the house circuit into which it is connected. Vacuum tubes are covered by the manufacturer of the vacuum tube for 90 Days. Contact Miller Audio if you are having problems with tubes in a new amplifier purchase. We assemble, test and burn-in a complete amplifier and tube combination to ensure they perform to MALLC standards of performance. In this burn-in & check-out phase we are looking for weak or failing components throughout the amplifier, not only tubes.

#### **Warranty Exclusions**

The following are not covered under Warranty:

- Units which have been damaged by misuse, abuse, accidents, improper assembly, or use of parts not designed or intended for use in the DYNA-70 audio upgrade system or for use in an original Dynaco ST-70 Series I type of amplifier design.
- Units which have been modified, altered, or improperly repaired by anyone not specifically authorized by Miller Audio LLC.
- Units not purchased from MALLC or an authorized Miller Audio LLC dealer in the United States for use in the United States.
- Normal wear & tear of consumable items (Vacuum Tubes & Fuses).
- Incidental or consequential damages are not covered under this warranty.

**NOTE:** Some states do not allow the exclusion of incidental or consequential damages, this exclusion may not apply to you.

#### **Warranty Service**

To obtain Warranty Service, the unit must be shipped, along with evidence of proof-of-purchase, in factory packing to Miller Audio LLC (or it is designated service provider) with freight and insurance prepaid by the owner. After repair, the unit will be returned with freight and insurance prepaid by Miller Audio LLC to any destination in the United States. All implied warranties, including merchantability and fitness for a particular purpose are limited in duration to the duration of this expressed warranty.

**NOTE:** Some states do not allow limitations on the duration of implied warranties; the above limitations may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state. Miller Audio LLC products purchased outside the United States are covered by warranty terms of the importing distributor in the country in which the product was originally purchased, which may differ from the terms herein this document.

Importing distributors are not obligated to provide warranty service for products originally purchased outside their country. Miller Audio LLC will provide warranty service for products outside the United States, but in these cases, the customer must pay all shipping, handling, and customs costs both to and from Miller Audio LLC in Dallas, TX, USA.

Questions about this warranty should be addressed to:

Miller Audio LLC  
4255 Peppermill Lane  
Dallas, TX, USA 75287-3969

Email: [info@milleraudiollc.com](mailto:info@milleraudiollc.com)

The Miller Audio LLC Service Department can also be reached by e-mail at: [info@milleraudiollc.com](mailto:info@milleraudiollc.com), or by phone at: 1-972-693-5116. Miller Audio LLC is in the Central Standard Time (CST) zone in the U.S.A. and is -6 hours *behind* Greenwich Mean Time (GMT).

#### **E. ELECTROMAGNETIC INTERFERENCE (EMI) & RADIO FREQUENCY INTERFERENCE (RFI)**

Considerable care has been taken in the design & assembly of the DYNA-70 Ultimate Upgrade ST-70 amplifier to minimize its susceptibility to RFI and other forms of EMI that cause hum and noise.

Choice of materials, physical layout, grounding practice, power supply design, wiring twist and routing are used to reduce electromagnetic & RF noise in this amplifier. However, since our primary goal is in the accurate reproduction of recorded music for home environments, we do not compromise this objective in use of RFI filters, or grounding practices that reduce RFI at the expense of degraded audio performance.

Our hum and noise reduction strategy has worked extremely well, resulting in only rare instances of EMI / RFI noise problems which can be addressed locally, as needed. Care in proper installation and set-up of your audio system can avoid EMI induced issues. Physical location and cable routing and “address” can be a crucial factor in minimizing hum and noise in any audio system.

The following practices should be observed in all installations and will be especially important where EMI /RFI is a problem:

- All audio signal interconnect cables (RCA or XLR signal input leads) should be kept as short as possible (3 meters or less).
- Whether terminated with RCA or XLR-style connectors, shielded audio signal cables should always be used (shielded cable will have two center conductors, and a separate external shield connected at only one end of the RCA or XLR terminated cable).
- Separate and situate the preamplifier as far away as practical from the power amplifier, and power (main AC primary supply) supply cables should be routed to remain a minimum of at least 8-10 inches (~20+ cm) or more away from all signal input & speaker output cables.

- **Never** operate audio equipment with the chassis covers removed. This defeats the EMI / RFI shielding of the unit and can introduce EMI / RFI noise into your preamplifier, amplifier, CD-Player, DAC, Tuner, and any other nearby audio pieces in your system.

**NOTE:** It is fine to operate your DYNA-70 Ultimate Upgrade ST-70 amplifier without the Tube Cage. However, we advise caution against using your ST-70 without a bottom cover for EMI / RFI noise and interference purposes. Additionally, a bottom cover has vent holes to allow cooling air to enter chassis enclosure, and feet that lift unit off a flat surface to permit airflow into the unit and a way to grasp and pick-up the amplifier.

#### **F. CONNECTING THE DYNA-70 AMPLIFIER TO YOUR AUDIO SYSTEM**

**INPUT:** Connect a preamplifier to your DYNA-70 / ST-70 amplifier using the Left & Right RCA input connectors located on front of the amplifier.

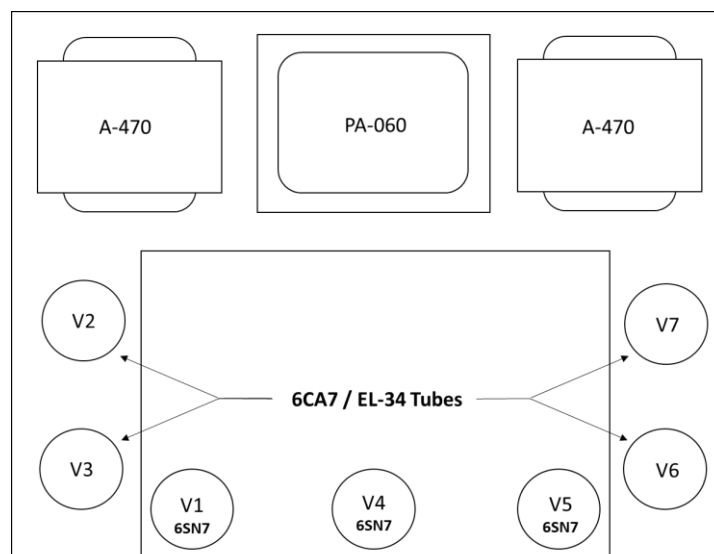
**OUTPUT:** Terminal Blocks are provided at the back of the amplifier for connecting your loudspeakers, with correct spacing to accept a standard "banana" plug or banana plug adapters. They will also accept spade lugs, bare wire, or pin connectors. In a stereo system, the two channels should be connected in correct "relative phase". This means that when the same signal is applied to both channels, the right and left channel speaker diaphragms will move synchronously - in and out together. You can test this using a 1.5 volt Dry Cell battery (Search Google for "speaker driver testing using an alkaline battery").

Terminals on speakers are usually coded - one terminal will be designated "C" for common or "ground", "-" (i.e., a minus, or negative sign) or will be Black in color. The other terminal is designated "+" (plus or positive) or Red in color. "In phase" connection of the speakers can normally be achieved by connecting the wire from the "+" amplifier terminal to the Red or "+" terminal on each speaker and connecting the "-" terminal to the Black or "negative" terminal on each speaker.

In-phase connection of the speakers can be readily ascertained by ear. Listen to a recording of a solo vocalist (use a mono recording if available). With the speakers in phase the voice should be clearly focused between the two speakers. With the speakers connected out of phase, the voice will be diffused, with no identifiable source location. Relative phase can be reversed by switching the "+" and "-" leads on one speaker only.

#### **G. VACUUM TUBE REPLACEMENT & BIAS ADJUSTMENT**

The DYNA-70 / ST-70 uses seven vacuum tubes of two distinct types: Three type 6SN7 (V1, V4 and V5), and Four type EL-34 / 6CA7 (V2 & 3 on the left side and V6 & 7 on the right side). The brands of tubes we supply have been chosen by selecting brands which are known to be the most dependable and with extensive auditioning of these brands based on audio performance.

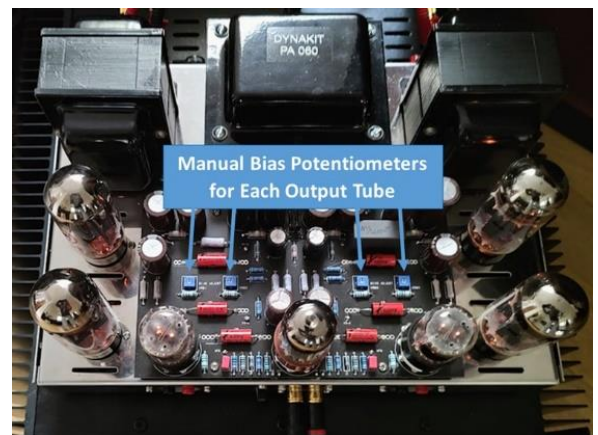


We recommend that you purchase replacement tube sets from Miller Audio LLC. We anticipate tube life to accommodate one-to-three years of operation without degradation in normal use - if the amplifier is switched off when not in use. If it is always left on, tube life can be exhausted in a matter of a few months.

The DYNA-70 Ultimate Upgrade ST-70 has been designed to make tube replacement as simple as possible. Because all Power tubes are individually biased (regardless of whether you have a Manual or Automatic Bias version), replacement tubes need not be matched pairs or quads. However, *we recommend for best audio performance, you always use a matched quad of 6CA7/EL-34/KT-77 power output tubes, as well as a matched trio of 6SN7-GTA or GTB preamp signal tubes.* Matched trios of tubes are not common, so you can purchase a matched pair of 6SN7's for V1 and V5 driver tubes and a single tube for V4. Alternatively, you can purchase two matched sets of 6SN7's and use the 4<sup>th</sup> tube as a spare / back-up tube.

**NOTE:** ALWAYS use the *best* of the 3 6SN7's in the V4 position (middle socket of the DYNA-70 Upgrade Circuit Card Assembly); the matched pair is to be used for positions V1 & V5.

**Manual Bias-** It is necessary to re-bias a Manual Bias DYNA-70 amplifier when the 6CA7/EL-34/KT-77 power tubes are replaced. Additionally, depending on how often you listen to your amplifier, a Manual Bias amplifier will need periodic bias adjustments, on average every 4-6 mos. or every 2-400 hours of use. The 6SN7 GTA/B tubes are not biased, so there is no need to address Bias with the 6SN7 tubes. *However, they will need to be inserted in the main PCB when setting the bias for the power output tubes.*



**Auto Bias-** The DYNA-70 / ST-70 Automatic Bias version has built-in Green Bias LED indicators, and no tools or measurement devices are required when changing these tubes. Power down the amplifier and unplug it; Remove the old, expired tubes and replace with new tubes; the Auto Bias system will do all Biasing required when you power on the amplifier.



If one of the Green LED's does not illuminate, it is an indication there is something wrong with the tube. Turn-off the amp and swap the tube with another tube in the amp; power back on and see if the tube will Bias in another socket. If it will, observe as you play amplifier and see if it does not Bias (Green LED on) again. If tube continues to give trouble and not illuminate the LED, it is either defective or it is consumed and it is time to replace it.

### **Set Bias with Amplifier removed from Audio System**

You will need the following tools to set the Bias with the DYNA-70 amplifier removed from your audio system:

- Small Phillips Screwdriver- to remove the bottom cover;
- Small straight-Blade screwdriver- to adjust the Bias Potentiometers;
- 2- RCA Shorting Plugs- insert into RCA jacks on face of DYNA-70 Amplifier;

- 2- 8-Ohm, 20-Watt Wire Wound Resistors, insulated, with spade terminals- attached to 8-Ohm Speaker Terminals on the back of the DYNA-70 Amplifier- to simulate a speaker load;
- 2- Digital Volt-Ohm Meters (DVOM)- to read the Bias voltage.

**Step 1-** Power off and unplug the Amplifier. Wait 15-20 minutes for the amplifier to cool and the capacitors to discharge. Remove the amplifier from your audio system. If replacing tubes remove the old tubes and insert the new tubes.

**Step 2-** The amplifier should be connected to a load. Use the 2, 8-Ohm 20-Watt resistors and attach them to the 8-ohm terminals on the left and right terminal blocks, and the other end of resistor attaches to the “C” or common ground terminal on the back of the DYNA-70 amplifier. Next, insert the RCA shorting plugs into the Left and Right RCA input jacks on the front of the DYNA-70 amplifier.

**Step 3-** With the amplifier turned off, and the shorting plugs in the RCA input jacks and the 8 Ohm resistors simulating a loudspeaker load, you are ready to begin the Bias adjustment process. Turn each of the four blue potentiometers screwdriver adjustable controls counterclockwise until the pot stops to turn- do not force it in anyway.

**Step 4-** Connect the 2 DVM’s to the left side tubes, use one meter on Valve 2 and the other meter on Valve 3; connect the positive (Red) lead to the jumper between pins 1 & 8 for output Tubes 2 & 3 and the negative (Black) lead to the chassis (anywhere on a stainless steel chassis), or a chassis ground point or uncoated areas if you have a Black powder-coated chassis.

**Step 5-** Power on the Amplifier and let it warm-up for 10-15 minutes.

**Step 6-** With amplifier operating and DVOM leads connected as instructed in Step 4, slowly turn Bias pots clockwise and increase Bias voltage to V2 and V3 tubes. Slowly adjust and gradually increase voltage on both pots in similar increments, bringing Bias up slowly and equally on both tubes. Get them close to the Bias voltage but notice that changing one tubes Bias value will affect and change the other tube as well, so you will not set these correctly on the first adjustment. It will require continuous adjustment and re-adjustment until you achieve the correct Bias setting- since adjusting one tube, impacts the other tube. If you have them close, then stop for the moment (you will “dial them in” as the last step).

**Step 7-** Repeat Step 6 again for tubes V6 and V7 on the right side of the Amplifier. Again, get them close but know that by adjusting V6 & V7, the settings will be off now on V2 & V3. This is normal and common when setting tube Bias.

**Step 8-** This is where borrowing 2 more DVOM’s from a friend will come in handy - watching all 4 DVOM’s- now adjust and bring Bias to the proper 0.400mVDC (0.40 Volts DC) on all 4 tubes. If you do not have that many DVOM’s, just place one on the left and right sides and jump back and forth between Tubes V2 & V3 and V6 & V7 until you get them all within a few mV of each other. You have just set your Bias!

**Step 9-** Shut your amplifier off, disconnect all DVOM leads from the amplifier, install the bottom cover, and enjoy your newly Biased tubes.

**NOTE:** If the tubes are over two to three years old, or have more than 1,200-1,500 hours on them, a complete replacement tube set could be in order. However, this is a function of several variables (type of tube, bias setting, bias type {Auto vs. Manual} quality of tube, house line primary voltage), and how much you play your audio system. Therefore, your “mileage” may vary WRT tube life. See our first suggestion below to decide if you need new tubes.



## **H. GETTING THE MOST FROM YOUR DYNA-70 ULTIMATE UPGRADE ST-70 TUBE AMPLIFIER**

Whether this is your first vacuum tube amplifier, or you have a house full of tube equipment, there are several tips to follow when using tube amplifiers to ensure you get maximum performance and enjoyment from your audio system. Some suggestions and recommendations are simple to implement and incorporate into your “audio routine;” other suggestions will require more time, planning and money to implement. However, all suggestions we make will move you closer to achieving “audio nirvana.”

- We recommend that you consider purchase of a tube tester. To keep your tube equipment in top shape, you should have your own tube tester. Plus, if you buy used tubes, you can check the quality and life left in those used tubes. There are plenty of folks who peddle poor performing tubes with little life left in them, so you can help to keep those tube sellers on-line honest and ensure you have a good stock of tubes.



- Likewise, we recommend that you purchase a spare set of tubes, even if they are used. Having spare tubes on a late evening or weekend when you are entertaining is the time you will need them (trust this fact!). Do not disappoint your guests and fellow audiophiles; whether new or used, have some spare tubes to keep the party going.

- Consider using a 10 – 20 Amp Variac to control your line voltage. Tube equipment is more sensitive to line voltage fluctuations, which can impact bias and heater filament voltages, not to mention other voltages in the amplifier. This is most practical if you are using multiple tube audio pieces for your preamplifier, amplifier, DAC, or CD Player (yes, there are some tube-based CD players out there). You can connect the Variac to a power strip and regulate the entire strip output to be in the 115-118 VAC line voltages of 50+ years ago.



- Better than using a Variac, we suggest you consider a dedicated electrical service for your audio room and system. You can have a quieter system and with use of power filtering, have a quiet “black background” on all your audio equipment.

- If having a dedicated power supply system for your listening room exceeds your budget, then consider purchase of a Medical or Hospital Grade Power Supply. These can be found used on-line from equipment resellers, as well as on Craigslist, eBay, and similar sources. It is the best \$500-1000 you can spend for your audio system. We always use one at Audio Shows to ensure we have clean, noise-free power no matter where we are showing.



- Use a small cooling fan for all your tube audio equipment. While tube equipment is designed to operate at elevated temperatures, the fact is the cooler anything operates, the longer it will last. We try to ensure there is some air movement around our tube preamplifiers & amplifiers creating modest convection currents in and around the tubes, transformers, and components. We recommend and use a Vornado-brand, Zippy Fan.



These come in several colors and can be purchased from Target, Amazon, eBay, etc. The fans feature cloth blades and are safe around pets and children. They

feature two speeds, and on the lowest speed, are extremely quiet. We use on all our personal audio equipment.

## **I. CLEANING YOUR DYNA-70 AMPLIFIER**

Prior to cleaning your DYNA-70 amplifier, ***Always*** Power Off and allow the amplifier to cool; then unplug the amplifier prior to cleaning.

Use a lint-free, microfiber cloth to wipe down your DYNA-70 amplifier anytime there is dirt or dust that has settled on the unit. Be careful to not hit or knock the SMT-334 regulators that are under the left and right edges of the DYNA-70 circuit card, next to Valves V3 and V6 (front power tubes on left and right side of the chassis).



An automotive detailing dust brush comes in handy for these cleaning activities. We find it sometimes is easier to use a cleaning brush to clean and “dust” the entire amplifier.

### **Dusting the DYNA-70 Circuit Card**

To clean dust off the DYNA-70 Circuit Card, we recommend using a long, soft bristle paint brush, a “Chip Brush”, an automotive interior detailing brush, or a make-up brush to gently brush around the circuit board components to remove dust and dirt that have settled on the printed circuit board and components.

An alternative to brushing is low-pressure air from canned air used to clean computer keyboards. If you have access to an air compressor, use low pressure air at 15-20 psi while holding the air nozzle a fair distance from the board and components.



We recommend you *use no liquid solutions of any kind on the circuit board.*

If you must remove soiling that requires a liquid cleaner, ***NEVER*** spray the amplifier or circuit board with cleaner, always spray the wipe with cleaner- and do so sparingly- you only want a damp wipe, never a moist or sloppy wet wipe!

## **J. HOW TO TROUBLESHOOT YOUR AMPLIFIER**

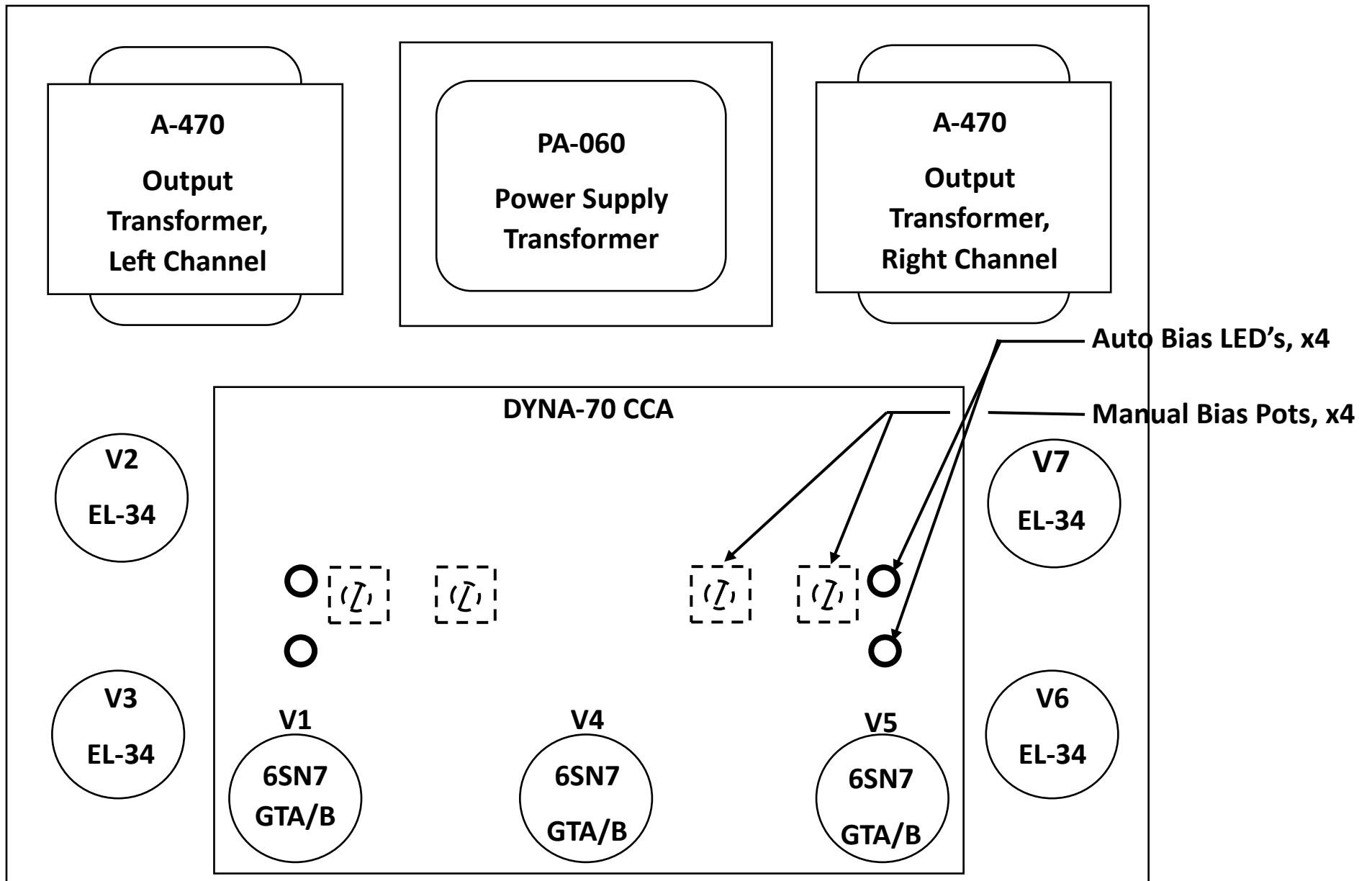
Not all things in an amplifier are equally likely to fail. Our experience with tube equipment has demonstrated that failures often occur in the following order of likelihood:

1. Operator Error: A control, connection, or setting is connected or switched improperly;
2. Tubes: An item to have gone faulty on a once-working amp- its why tubes use sockets;
3. Power Supply Components: These manage a lot of energy & get hot;
4. Resistors and Capacitors: With focus on electrolytic capacitors & old carbon composition resistors;
5. Mechanical Components: Tube Sockets, power & control switches, audio jacks & connectors;
6. Cables & Cords: Common to find shorts, poor connections, or failed connections;
7. Internal Wiring: Failure here is rare, unless recently altered.

Refer to our Troubleshooting Check List on following page:

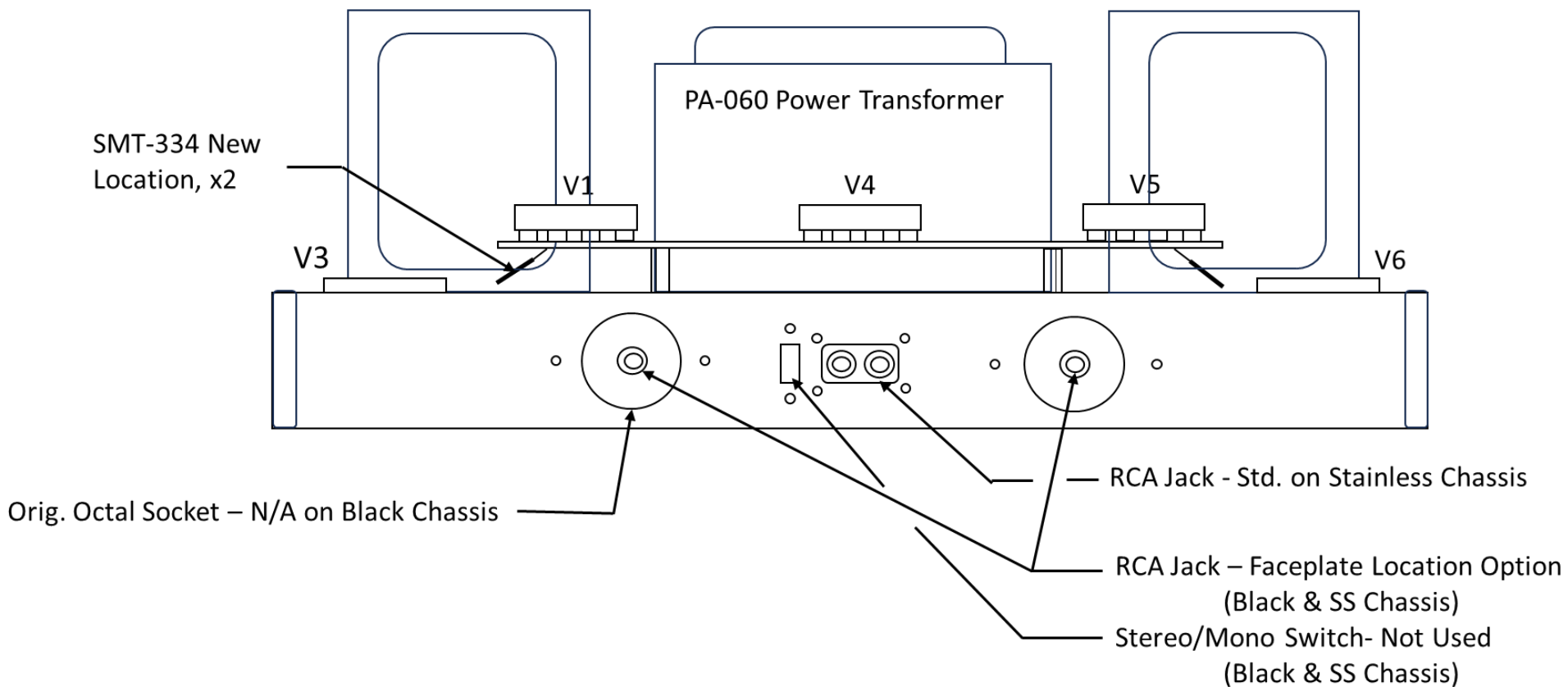
Troubleshooting Check List	Remedy
<b>Amp Will Not Power On</b>	Amplifier Not Plugged In IEC Power Cable not connected to IEC Socket on back of amplifier Power Switch on Back of Amplifier is turned Off Blown Fuse Circuit Breaker Tripped in Home Main Electrical Service Panel Return to Miller Audio LLC for Service
<b>Tube has no "Orange Glow"</b>	Power Off to Amplifier No Power to Tube Try replacing or swapping the tube with another and see if problem persists Filament / Heater supply not working or burned-out Heater Filament Swap with another Tube and see if problem follows the tube or problem remains with the socket Return to Miller Audio LLC for Service
<b>Static, Hum or unusual Noises</b>	Possible Microphonic Vacuum Tube- Replace or swap tube with another and see if problem follows the tube Crossed Signal Lead or Speaker output wire near Primary AC power causing 60 Hz hum Ground Loop in Audio System (can be through RCA signal cables or Primary Power Line- ensure only one side of leads are grounded!) EMI / RFI entering unit- ensure good separation between audio pieces and all covers are in place and cables separated Return to Miller Audio LLC for Service
<b>Amplifier Blows Fuses</b>	Replace Fuse and try Again- if problem persists contact Miller Audio LLC for next steps Remove all Tubes from Amplifier and Power on- Did Fuse Blow? If not , add 6SN7 Tubes and try again- Did Fuse Blow? A Bad Tube, Shorted Tube or a Tube that arced Return to Miller Audio LLC for Service
<b>Amplifier is Louder on one Channel</b>	Preamplifier Balance Control not centered Defective or damaged audio input signal cable Weak or consumed Tube(s)- Swap suspect tube(s) and see if problem follows the tube Improper adjustment of Bias setting between Left & Right side Return to Miller Audio LLC for Service
<b>Arc, Spark or "Pop" from Tube</b>	A weak or a consumed Tube- Replace with a New Tube and see if Problem goes away or persists Sometimes can happen with new Tubes from residual contaminates in Tube Mfg. Process Occasional flaking of Tube plate coatings can cause this as tube ages and is consumed If a Tube "Pops" or makes loud, unusual noises, shut off amplifier and replace Tube immediately- Tube is defective or shorted Return to Miller Audio LLC for Service
<b>Amplifier Smells Hot</b>	Common with a New Amplifier or a New set of Tubes A new Amplifier can smell hot until it breaks-in and runs a while; this is Normal Use of a Vornado-Brand Zippy Fan helps cool amplifier and dissipates effects of heating Return to Miller Audio LLC for Service

NOTE: Other than Bias Adjustment there are no Owner Serviceable activities with a Dyna-70 Ultimate ST-70 Amplifier. Return your amplifier to Miller Audio LLC for proper service.



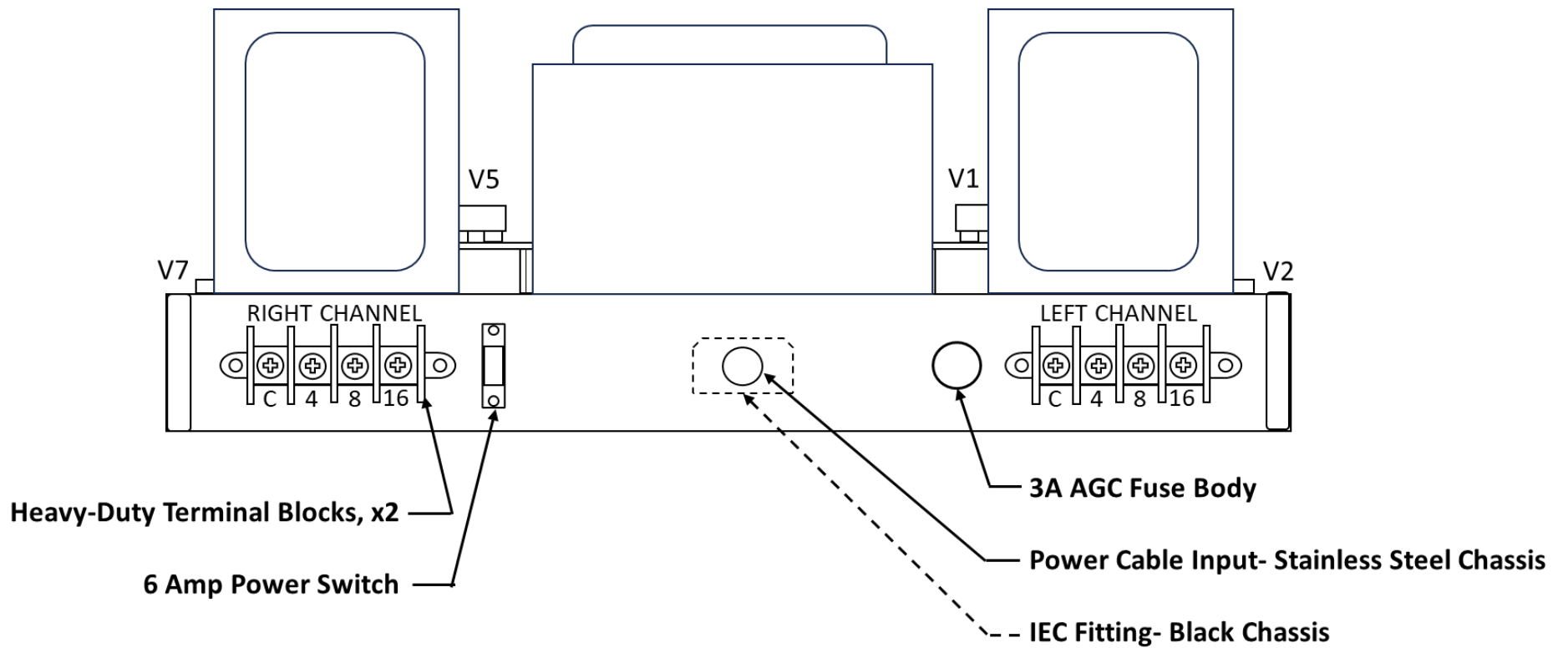
Top View - DYNA-70 Ultimate ST-70

Not To Scale



**Front View - DYNA-70 Ultimate ST-70**

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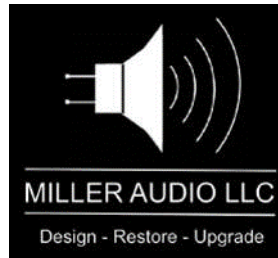


**Back View - DYNA-70 Ultimate ST-70**

Not To Scale

Is something in this manual confusing, contradicting, or perhaps you found a typographical error? Send your corrections, questions & comments to [info@milleraudiollc.com](mailto:info@milleraudiollc.com). You will help yourself and everyone who owns a DYNA-70 Ultimate Upgrade ST-70 amplifier.

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**Miller Audio LLC**  
**Dallas, Texas**



**DESIGNED & MADE IN THE U.S.A.**

**Assembled in the U.S.A from Components Sourced Internationally**  
**Domestic Component Content: 65 - 75%**

**END**