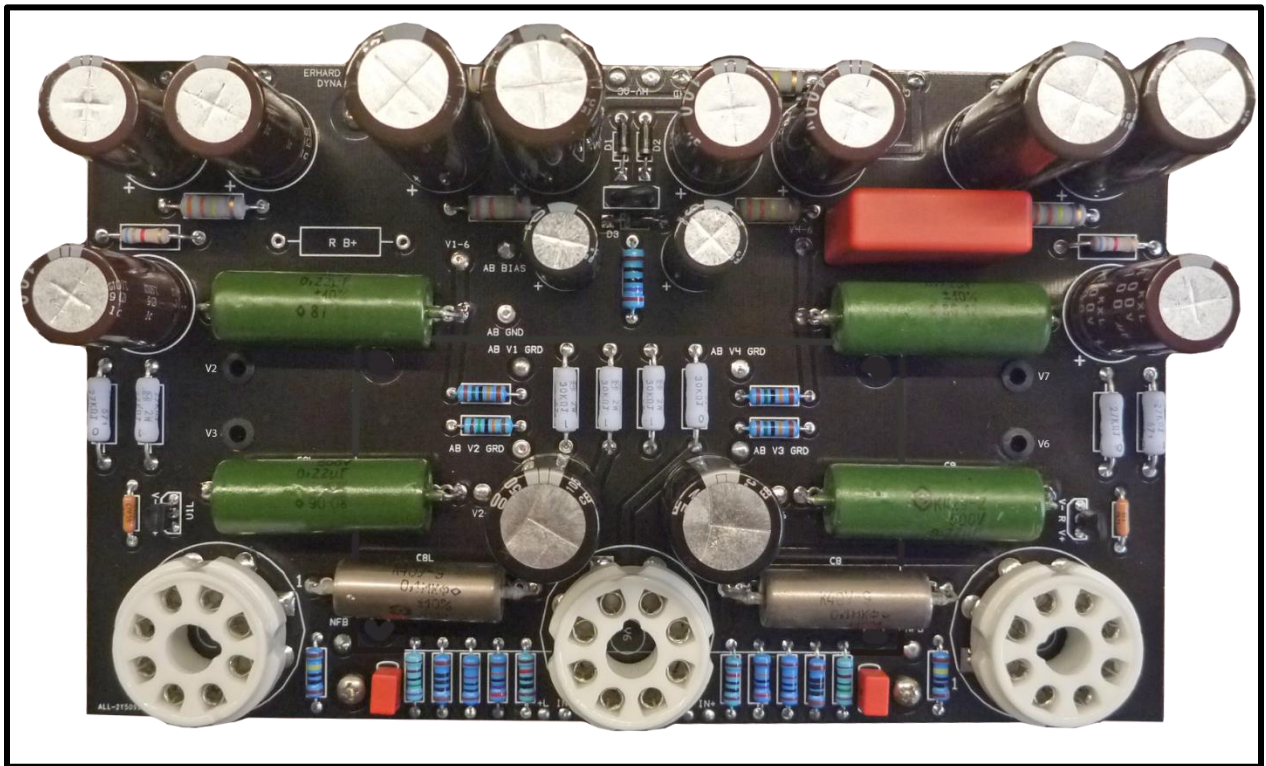




ADDENDUM

Dyna-70 Ultimate Upgrade Circuit Card Assembly



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Miller Audio LLC
Revision A
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DYNA-70 CIRCUIT CARD ASSEMBLY & INSTALLATION

A. INTRODUCTION

Thank you for purchasing our Dyna-70 “Ultimate” ST-70 upgrade kit. Since our introduction of the Dyna-70 Ultimate Upgrade Kit, we’ve received feedback that we don’t provide enough information & documentation for new owners of the Dyna-70 kit to assemble the primary circuit card. This addendum has been prepared to discuss assembly, but to also point out some tips and tricks we use here at Miller Audio LLC to assemble and check-out a new Printed Circuit Board (PCB) and resulting Circuit Card Assembly (CCA).

Let’s start with some definitions: Throughout our manuals, and even on our website, we use the terms “PCB” and “CCA” and it seems to confuse builders. This is not our goal and the reason we’ve written this Addendum to help those building a Dyna-70 Ultimate Upgrade kit. The definition is provided in the later pages of the Assembly Manuals, but the definitions are:

PCB- Printed Circuit Board (aka Printed Wiring Board, PWB): an incomplete electronic assembly, a PCB provides or routes combinations of AC and DC voltages, analog, and digital signal distribution, as well as hosting of electronic components. A PCB is a part of a CCA but cannot perform the function of a completed CCA. PCBs provide all interconnects between components and permits location of components on either side of the PCB. Photo 1 below is a pic of one of our PCB’s supplied with the Dyna-70 Ultimate Upgrade Kit.

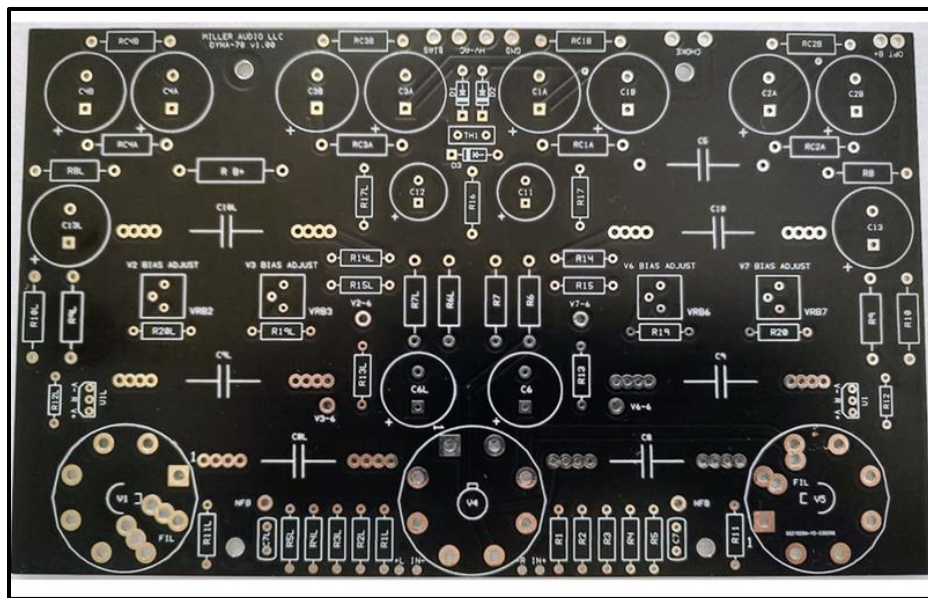


Photo 1: Dyna-70 Manual Bias Printed Circuit Board

CCA- Circuit Card Assembly: A complete electronic assembly consisting of a Printed Circuit Board (PCB) that is populated with passive and active electronic components, such as resistors, capacitors, diodes, inductors, transistors, microprocessor's, inputs & outputs, etc. The cover of this Addendum depicts a completed, ready to install Automatic Bias Circuit Card Assembly

B. ASSEMBLY TIPS

These assembly tips will help to build confidence in your assembly process of the Dyna-70 CCA. Please note and follow these instructions and tips; they can and will make the build better and aid your understanding of the details in proper assembly. Always remember to check 2-3 times before soldering in a component in the CCA. If you get stuck, give us a call, send an email, etc. and we will gladly try to talk you through any confusing or frustrating assembly step.

If all else fails, you are welcome to send us your Kit and we will gladly assembly your Dyan-70 Ultimate Upgrade circuit card for you, for a fee of course. As an experienced builders of the Dyna-70 PCB/CCA, we've found it takes about 2.5 hours from start to finish to complete a Dyna-70 Circuit card assembly.

1. Check that you have all the parts needed.

While we strive to package kits with all the proper values and number of components needed, we're human and we do make mistakes. If your kit is missing a part, or the wrong quantity of parts, just contact us via email, phone call, etc. and we'll ship the correct item(s) you need that are missing.

Take note that when your kit was ordered we checked (and double check) all items are correctly pulled and packaged, but some parts are very small and often one can drop them and not realize it.

2. Wipe circuit board down with Isopropyl Alcohol before conducting any soldering.

This is a preventative measure to ensure the PCB is clean and ready to accept solder. While the boards are usually washed and cleaned during final processing, this is a good step to take with any kit building electronic project with PCB's and components that will be "stuffed" into a PCB.

3. As a rule, anytime you are populating a PCB, it's best to install or "stuff" the smallest components first, then working up to the largest parts being the last components installed.

Always start with resistors, diodes (D1, 2 & 3), and small film capacitors first (C7 through C12), followed by the Inrush Current Limiter (TH1), then the tube sockets and finally the taller electrolytic capacitors.

Another tip is to use the supplied parts list as a check list of what to install, checking off the components as you stuff and solder each component. Be methodical in your approach, take your time and take frequent breaks. This is an import, yet tedious process that takes time and focused attention. To aid in your success, we've included both the Auto Bias and Manual Bias Parts List in this Addendum so you can use as a Check List.

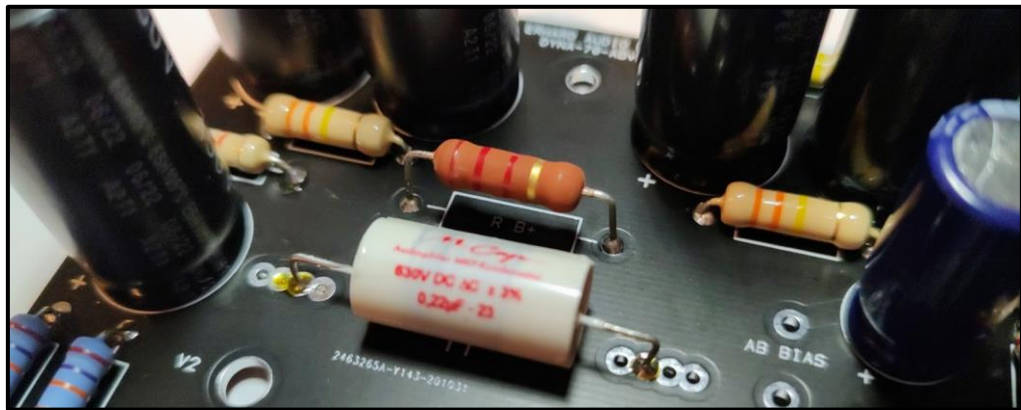
One exception to this process will be in the installation of U1, the two LM-334's. We recommend that these two components be installed when you are conducting final wiring integration between the Dyna-70 CCA and the ST-70 chassis. U1's should be

installed at same time you begin the wiring, but before you finalize the CCA installation and mount to the ST-70 chassis.

NOTE: The latest info on the -334's is addressed in Engineering Change Notice 002 (aka ECN#2). ECN 002 introduces a new part to the Dyan-70 design and eliminates problems with the earlier LM-334 thermal distortion issue addressed in ECN 001.

Also referenced in the Assembly Manuals is the 3-Watt Power resistor for setting the B+ voltage. This resistor gets quite warm; therefore, it is mounted off the PCB and elevated by about 1/8 to 3/16 of an inch, Photo 2. We advise mounting this B+ resistor as one of the last components to install, since in its elevated position its easy to bump and bend it out of alignment.

Another consideration is the value of the B+ resistor. We supply 3 resistors for the B+, depending on what the line voltage is to your home. We've found that using the 3300 ohm 3 Watt resistor is the preferred resistor to use here in the Dallas-Ft. Worth area and our local line voltages run around 122-124VAC.



**Photo 2: 3 Watt B+ Resistor is Mounted 1/8 - 3/16 of an inch above PCB
(Orange resistor in photo)**

4. **ALL electrolytic capacitor cans are oriented with the ground terminal to the back- or rear of the circuit card.**

This was done intentionally to help in the assembly process; ground is indicated by the White Stripe down the side of the can with a negative marking, Photo 3.



Photo 3: All Electrolytic Cap Cans have the Ground terminal facing the rear of the Circuit Card Assembly

- 5. Note orientation of the 6SN7 Sockets; none are installed in the same orientation- each has its own unique orientation, also indicated by the markings on PCB.**

The "notch" in the socket corresponds to the notch represented on the PCB; ref socket V4 (center socket) in photograph #4 below.



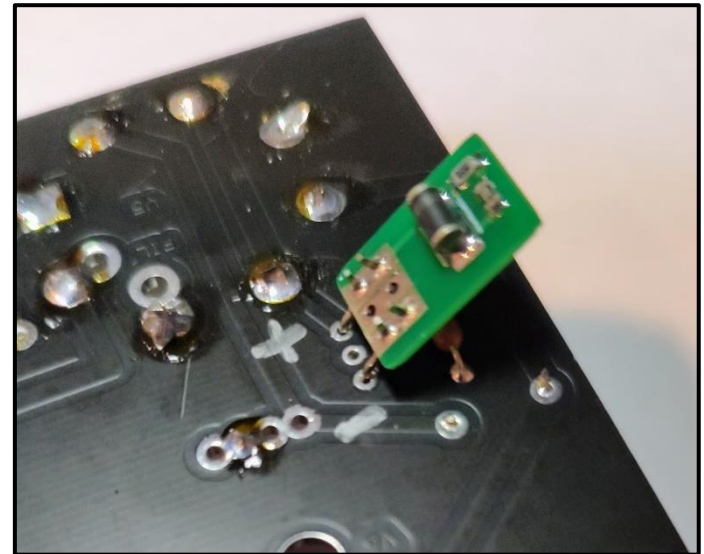
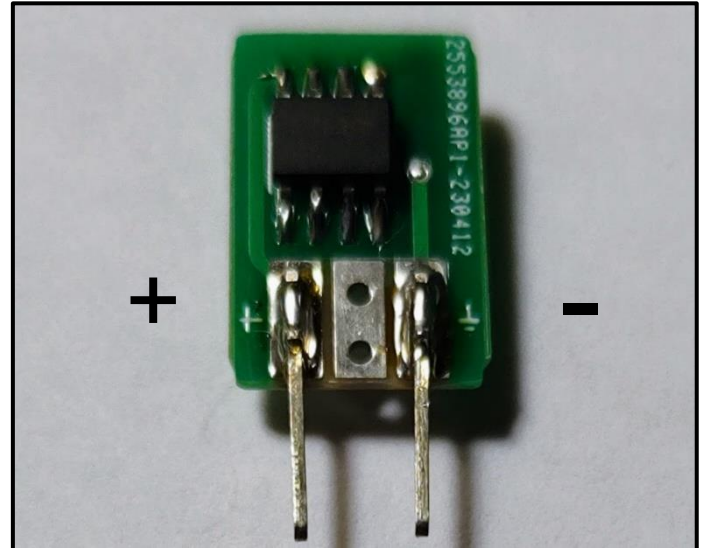
Photo 4: Socket Orientation for 6SN7's is indicated on the PCB

- 6. Orientation and Installation of the new SMT-334.**

NOTE: This is a simple but very easily confused process since you are working from the backside of the PCB and orientation is reversed. While the new SMT-334 is a thermally compensated part, we recommend for best sound performance and component service life the SMT-334 be mounted on the underside of the Dyan-70 CCA to shield it from tube heat. R12, the 8 ohm resistor that works in conjunction with the old LM-334, is to be removed and discarded, it is no longer needed when the new SMT-334 is installed.

When installing the SMT-334, we suggest you refer to the Engineering Change Notice 002, as well as these instructions so you are clear on the orientation. See following pics for each location. Always note the orientation of the pictures and where the tube sockets are.

As the photos depict, we transfer the polarity markings from the top side of the PCB to the bottom side to avoid mixing up polarities- DO THIS BEFORE you install any parts on the backside of the PCB. YOU WILL BE GLAD YOU DID!



Miller Audio LLC reserves the right to make design changes, parts replacement, substitutions and specification revisions at any time without notice. If you have questions about these changes/updates, please contact us.

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