DA3000
Audio Distribution Amplifier

PESA Switching Systems
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1.1 Manual Overview

This manual provides detailed instructions for installing and operating the PESA DA3000 Audio Mainframe. This manual is divided into seven sections as shown. Sections 3 and 4 contain in-depth operational and functional descriptions of the DA3000 Audio Mainframe and the associated Audio Distribution Boards.

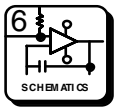
Section 1, **INTRODUCTION**, summarizes the manual, describes the product, presents a list of terms, and provides the panel specifications.

Section 2, **INSTALLATION**, provides installation and setup instructions.

Section 3, **OPERATION**, describes system operation procedures.

Section 4, **FUNCTIONAL DESCRIPTIONS**, presents an in-depth description of each component.

Section 5, **MAINTENANCE**, explains procedures for maintenance.



Section 6, **SCHEMATICS**, gives a complete package of technical documents such as schematics, and assembly drawings.

Section 7, **PARTS LIST**, provides a detailed list of system parts and components.

1.2 General Description

The DA3000 Audio Mainframe is the heart of PESA's new line of low cost audio distribution amplifiers. The DA3000 Audio Mainframe is housed a 2RU chassis with ten audio card slots. Audio signals can be distributed into 600 ohms or 66 ohms by selecting the appropriate plug-in cards. Up to two power supply modules can be installed in the DA3000 Audio Mainframe to allow single frame power redundancy.

Developed as a low cost modular frame, the DA3000 Audio Mainframe is easily upgraded as requirements in the field change. All plug-in modules and power supplies are installed and removed from the front.

Currently there are two models of plug-in audio distribution amplifier cards available; these are the ADA3001 Audio Board and the ADA3002 Audio Board. The ADA3001 Audio Board is designed to operate into 10K ohm loads (66 ohm source impedance) and the ADA3002 Audio Board is designed to operate into 600 ohm loads. Both audio distribution boards can accept input signal levels up to +30dBm.

Figure 1-1 DA3000 Audio Mainframe Front View

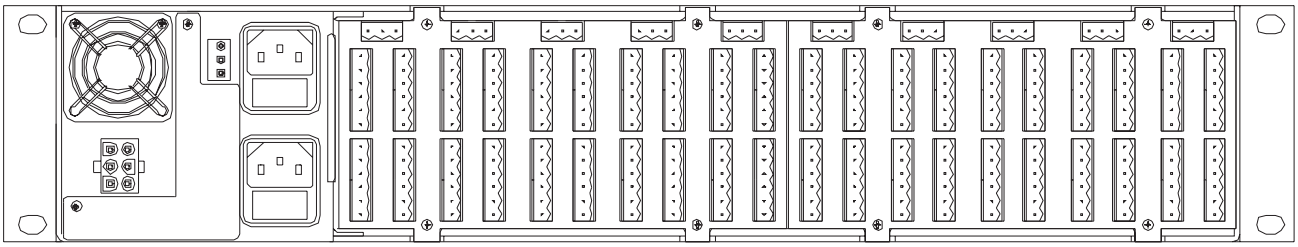


Figure 1-2 DA3000 Audio Mainframe Rear View

1.3 DA3000 Audio Mainframe Specifications

INPUT CHARACTERISTICS

Input Type	Looping Inputs
Connector Type	3-Pin Connector

OUTPUT CHARACTERISTICS

Number	8 Per Channel
Connector Type	3-Pin Connector

CARDS

Number	10 Per Chassis

ENVIRONMENTAL - Operational

Temperature	0℃ to 40℃
Humidity	10-90% Non-Condensing

POWER SUPPLIES

Number	1 (Standard) 2 (Optional)

MECHANICAL

Dimensions	2RU 19" W X 10" D 3.5" H (482.6mm X 254.1mm X 89mm)
Number of DA Modules	10
Number of PS Modules	1 Standard + 1 Optional

POWER

AC Voltages	100-130V, ±10%, 47-63Hz (US) 200-250V, ±10%, 47-63Hz (OUS)
Power	Apx. 45VA

1.4 ADA3001 Audio Board Specifications

INPUT CHARACTERISTICS

Level	+30dBm Max.
Impedance	>50K Ohm
Coupling	DC
Type	Balanced
Connector Type	3-Pin, 2-Part Detachable
Common Mode Rejection	>90dB @ 60Hz >60dB to 20KHz
Common Mode Level	±20V

OUTPUT CHARACTERISTICS

Level	+30dBm Max into 10K Loads
Impedance	66 Ohm, Balanced (Others available when special ordered)
Coupling	DC
Connector Type	3-Pin, 2-Part Detachable
Number	Eight
Output Isolation	
Output to Output	>70dB 20Hz to 20KHz
Module to Module	>100dB 20Hz to 20KHz

GAIN CHARACTERISTICS

Gain	Unity
Gain Stability	<±0.1dB Max.
Gain Adjust Range	+3 to +31dB (±6dB on 2 One Turn Pots, Fine and Course, +6, +12, +20, +28dB on Switch)

FREQUENCY CHARACTERISTICS

Frequency Response	<±0.05dB 20Hz to 20KHz <-1.0dB 20KHz to 100KHz

SIGNAL TO NOISE

Unweighted (Unity Gain)	>108dB @ +28dBm with 30KHz Filter

DISTORTION CHARACTERISTICS

Total Harmonic Distortion (THD)	<0.02% @ +30dBm, 20Hz to 20KHz
Intermodulation Distortion (IMD)	<0.01% SMPTE @ +18dBm <0.02% SMPTE @ +24dBm

ENVIRONMENTAL - Operational

Temperature	0° to 40°C
Humidity	10-90% Non-Condensing

1.5 ADA3002 Audio Board Specifications

INPUT CHARACTERISTICS

Level	+30dBm Max.
Impedance	>50K Ohm
Coupling	DC
Type Balanced	
Connector Type	3-Pin, 2-Part Detachable
Common Mode Rejection	>90dB @ 60Hz
	>60dB to 20KHz
Common Mode Level	±20V

OUTPUT CHARACTERISTICS

Level	+24dBm Max into 600 Ohm Loads
Impedance	600 Ohm, Balanced
Coupling	DC
Connector Type	3-Pin, 2-Part Detachable
Number	Eight
Output Isolation	
Output to Output	>70dB 20Hz to 20KHz
Module to Module	>100dB 20Hz to 20KHz

GAIN CHARACTERISTICS

Gain	Unity
Gain Stability	<±0.1dB Max.
Gain Adjust Range	+3 to +31dB (±6dB on 2 One Turn Pots, Fine and Course, +6, +12, +20, +28dB on Switch)

FREQUENCY CHARACTERISTICS

Frequency Response	<±0.05dB 20Hz to 20KHz
	<-1.0dB 20KHz to 100KHz

SIGNAL TO NOISE

Unweighted (Unity Gain)	>108dB @ +24dBm with 30KHz Filter

DISTORTION CHARACTERISTICS

Total Harmonic Distortion (THD)	<0.02% @ +24dBm, 20Hz to 20KHz
Intermodulation Distortion (IMD)	<0.01% SMPTE @ +18dBm
	<0.02% SMPTE @ +24dBm

ENVIRONMENTAL - Operational

Temperature	0° to 40°C
Humidity	10-90% Non-Condensing

2.1 Introduction

This section details DA3000 Audio Mainframe installation procedures. The following topics are discussed:

- Receipt Inspection
- Unpacking
- Location
- Mounting
- Cabling
- Plug-In Audio Card Installation
- Audio Power Supply Installation
- Front Panel Installation
- Rear Panel Connectors
- DA3000 Audio Mainframe System Connections

NOTICE

THE DA3000 AUDIO MAINFRAME AUDIO CARDS AND POWER SUPPLIES CONTAIN STATIC SENSITIVE DEVICES. CARE SHOULD BE USED WHEN IT IS NECESSARY TO HANDLE THESE CARDS. IT IS RECOMMENDED THAT A GROUND WRIST STRAP AND GROUNDING MAT BE USED BEFORE ATTEMPTING ANY EQUIPMENT INSTALLATIONS AND ADJUSTMENTS.

2.2 Receipt Inspection

The DA3000 Audio Mainframe was tested and inspected prior to leaving the factory. Upon receipt, inspect the equipment for shipping damage. If any damage is found, contact the carrier immediately and save all packing material.

2.3 Unpacking

The DA3000 Audio Mainframe is comprised of a frame, backplane, up to two audio power supplies, and up to ten audio distribution boards. The audio boards can be any combination of ADA3001 Audio Boards and ADA3002 Audio Boards. Prior to discarding packing material compare the parts received against the packing list. Carefully inspect the layers of packing material for any components which may have been overlooked during the initial unpacking.

2.4 Location

The DA3000 Audio Mainframe may be located anywhere power is available. However, units should be mounted as close as possible to their associated equipment to minimize cable runs. Installation should be in an area where the ambient temperature does not exceed 40°C (104°F) inside the equipment rack.

2.5 Mounting

The DA3000 Audio Mainframe is rack mounted in a standard 19" equipment rack. Sufficient space must be provided behind the rack to allow for the audio and power cables to be installed. All mounting holes should be utilized and mounting hardware tightened securely. As with all equipment installed in a rack, the bottom screw on each side should be installed before proceeding with the remainder of the screws. Then all screws should be securely tightened. Support the DA3000 Audio Mainframe's bottom while installing it in the rack. Figure 2-1 illustrates chassis installation in the equipment rack.

To install a DA3000 chassis in an equipment rack follow these steps:

1. Align the chassis with the slotted opening in the rack.
2. Install the bottom screws first.
3. Install the two top screws
4. Tighten all four screws securely.

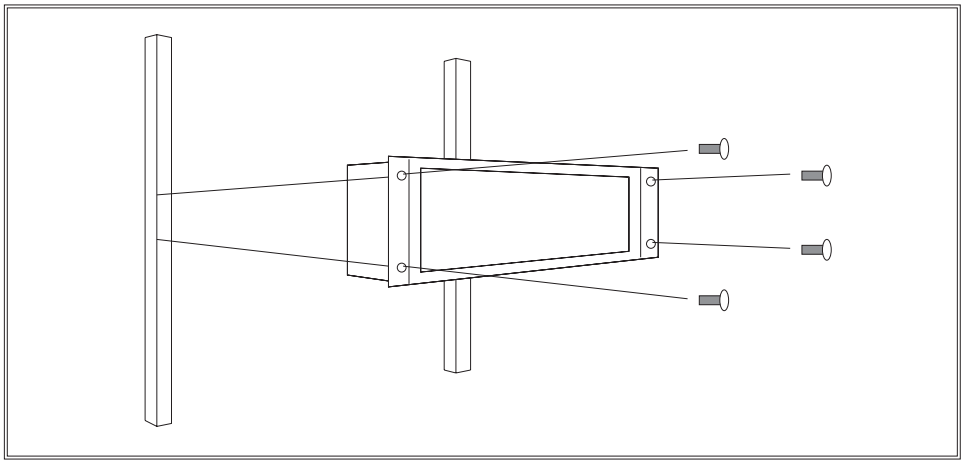


Figure 2-1 Chassis Installation

2.6 Cabling

Considerable weight will be added to the rear panel of the DA3000 Audio Mainframe by the audio cables and power cables. Therefore, all cables should be strained relieved and secured to racks or other supporting structures. Failure to provide adequate cable support can result in cables separating from connectors. If cable runs are to be stored under an elevated floor, they should be tied to the racks as a guide. If cables are run along the floor, do not allow them to lay in the work area behind the racks. Stepping or tripping on the cables may result in connections being pulled free or wire breakage inside the insulation. The DA3000 chassis should be installed in the equipment rack prior to attaching cables.

Use the following rules when cabling the DA3000 Audio Mainframe:

1. Lay all cables in their intended positions, separating audio from power and video cables wherever possible.

2. Provide proper support for each cable during the cabling process. The use of tie-wraps is recommended, as shown below in Figure 2-2.

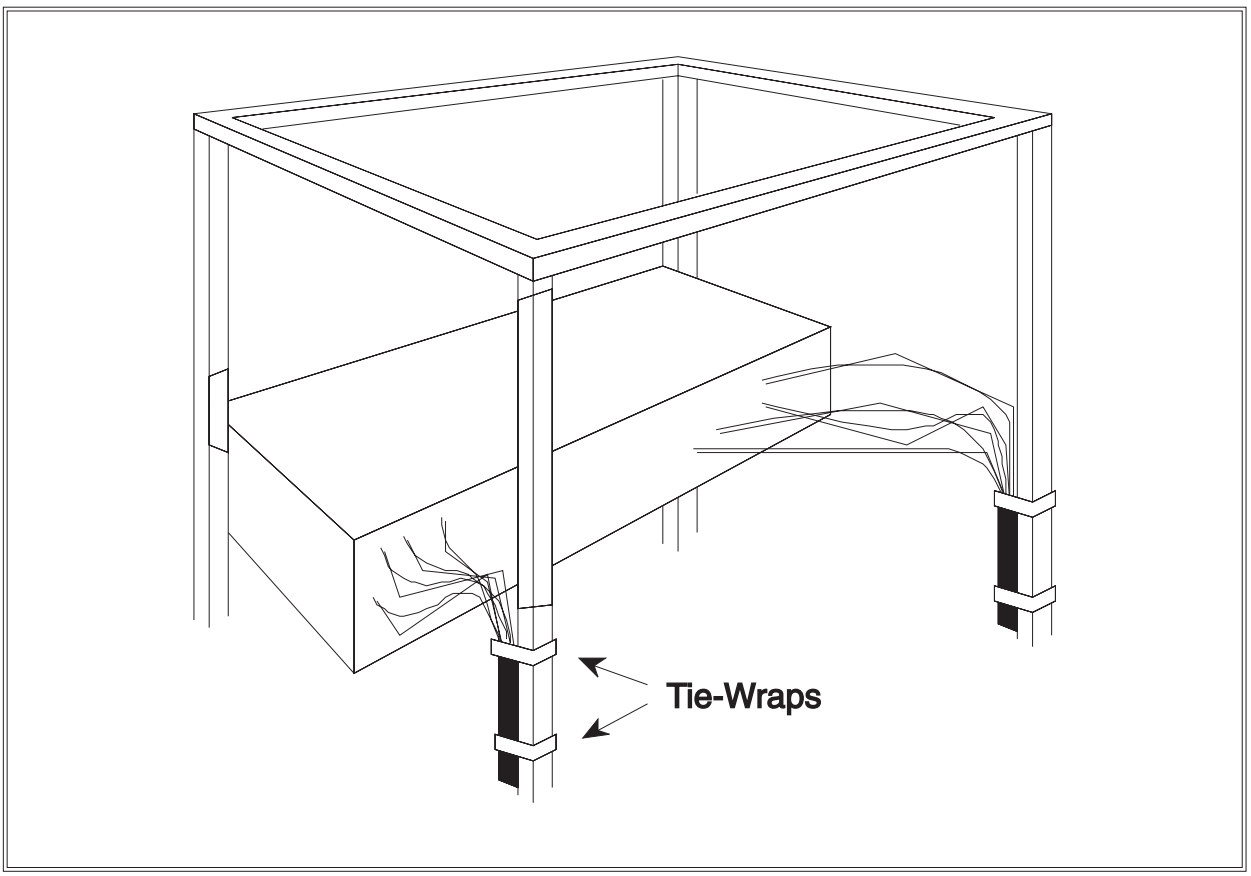


Figure 2-2 Cables Attached to Supports

2.7 Plug-In Audio Card Installation

Currently there are two models of plug-in audio distribution amplifier cards available; these are the ADA3001 Audio Board and the ADA3002 Audio Board. The ADA3001 Audio Board is designed to operate into 10K loads (66 ohm source impedance) and the ADA3002 Audio Board is designed to operate into 600 ohm loads. Both audio distribution boards can accept input signal levels up to +30dBm.

To install a Audio Board in the DA3000 Audio Mainframe take the following steps while referring to Figure 2-3:

1. Align the Audio Board with a set of circuit card guides in either the center or left-hand compartment of the frame.

2. Carefully push the Audio Board into the frame until the circuit card connector makes initial contact with the backplane connector. At this point, firmly but carefully continue pushing the Audio Board into the frame while making sure the connectors are properly aligned. Continue pushing the Audio Board until it is in place and the connectors are firmly mated.

3. Repeat instructions 1-2 for each Audio Board to be installed.

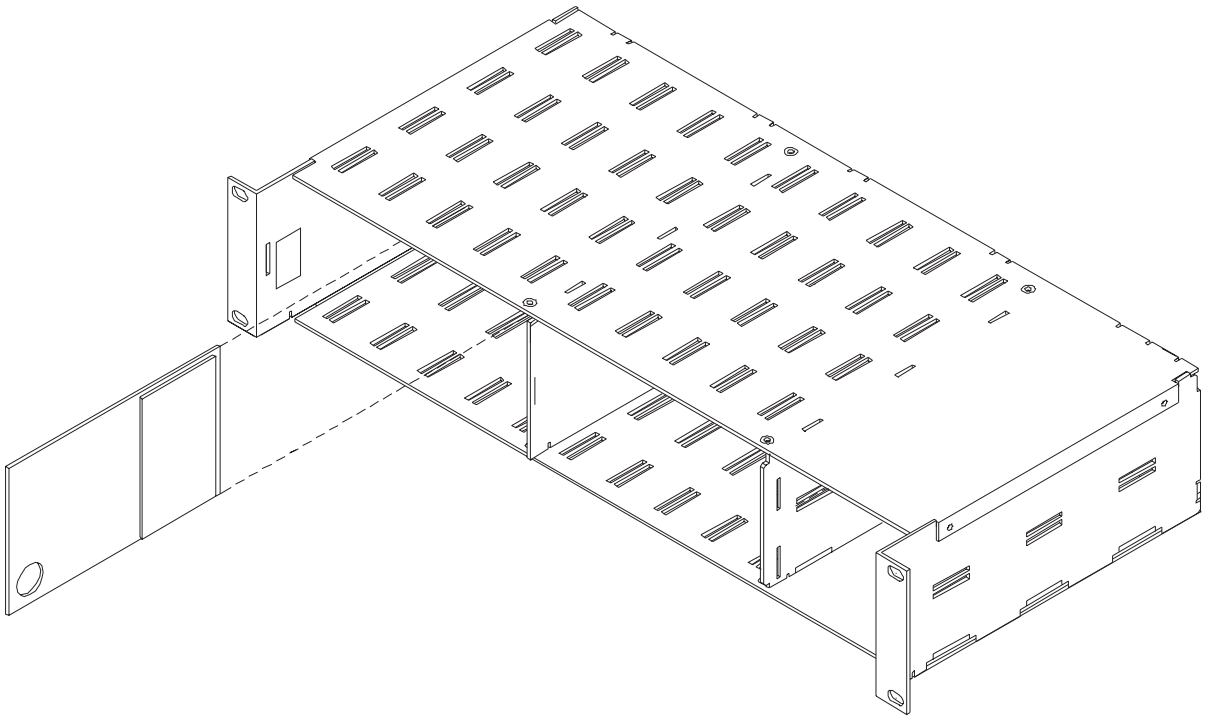


Figure 2-3 Audio Board Installation

2.8 Audio Power Supply Installation

Power is supplied to the DA3000 Audio Mainframe through an internally mounted PS45 Audio Power Supply. Power can also be supplied by an internally mounted secondary power supply or from an external power supply through the external power supply connector. External power supplies must be diode isolated from the internal power supplies. An 1N5821 or equivalent type diode may be used for this purpose. See Figure 2-4 for an illustration of diode installation. Each PS45 Audio Power Supply provides ±29-46 volts unregulated DC.

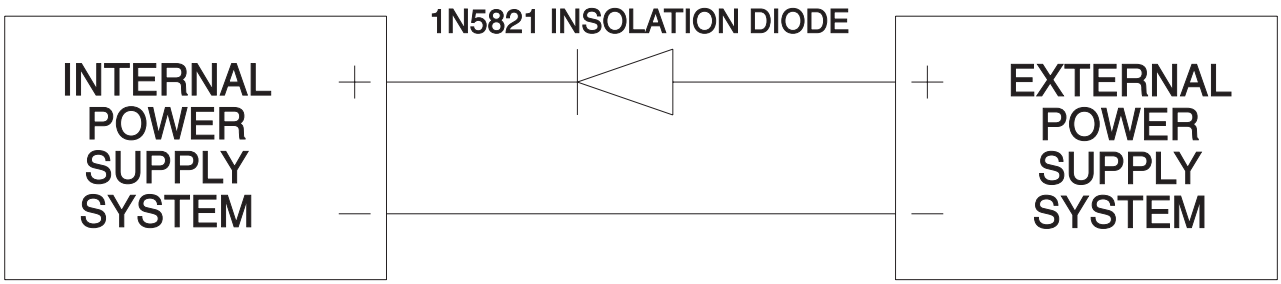


Figure 2-4 Isolation Diode Installation

In a redundant external power configuration, it should be noted that the DA3000 Audio Mainframe does not differentiate between the supply intended as primary power and the supply intended as backup. Therefore, consideration should be given to avoid overloading the power supplies by having less than one supply per frame in multi-frame configurations.

To install a PS45 Power Supply in the DA3000 Audio Mainframe take the following steps while referring to Figure 2-5:

1. Align the primary Audio Power Supply with the upper set of circuit card guides in the right-hand side of the frame.

2. Carefully push the Audio Power Supply into the frame until the power supply connector makes initial contact with backplane power connector. At this point, firmly but carefully continue pushing the PS45A Power Supply into the frame while making sure the connectors are properly aligned. Continue pushing the PS45A Power Supply until it is in place and the connectors are firmly mated.

3. If a redundant audio power supply is to be installed, align it with the lower set of circuit card guides in the right-hand side of the frame and repeat step 2.

2.8 Audio Power Supply Installation Continued:

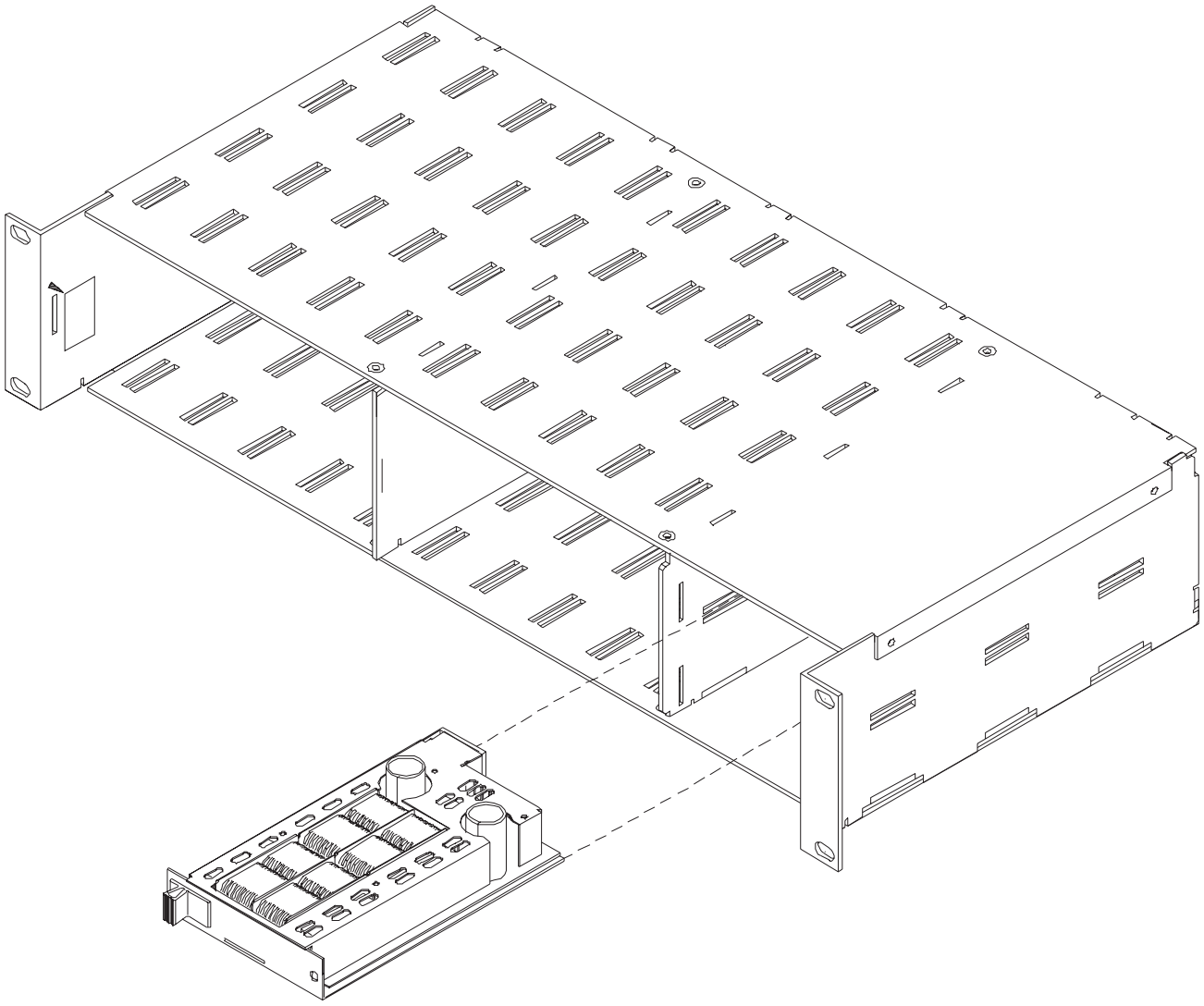


Figure 2-5 Audio Power Supply Installation

2.9 Front Panel Installation

To install the access door (front panel) of the DA3000 Audio Mainframe refer to Figure 2-6 and take the following steps:

1. Align the front panel to the front of the DA3000 Mainframe Assembly.

2. Now slide the front panel onto the mainframe assembly until the slide locks snap into place.

2.9 Front Panel Installation Continued:

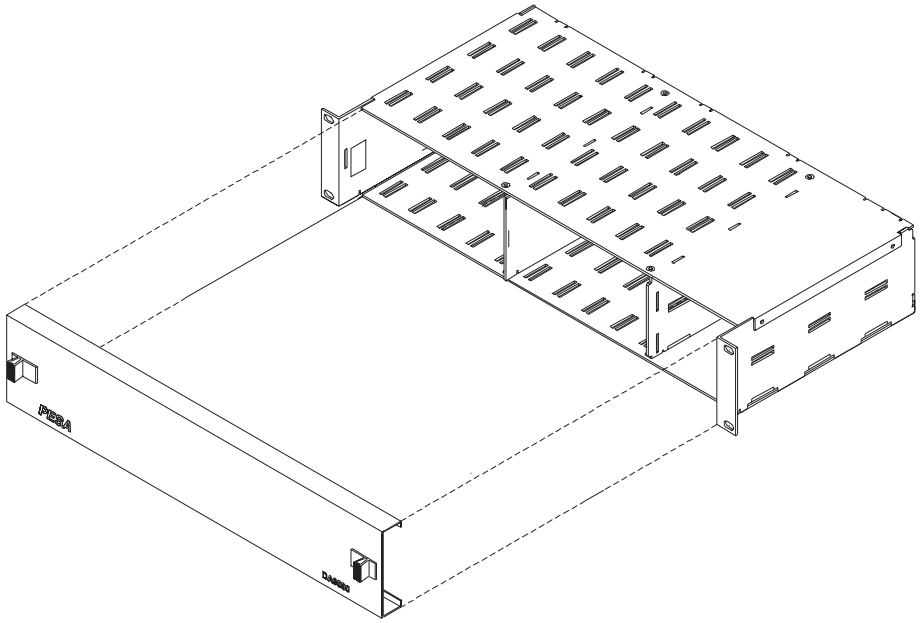


Figure 2-6 Front Panel Installation

2.10 Rear Panel Connectors

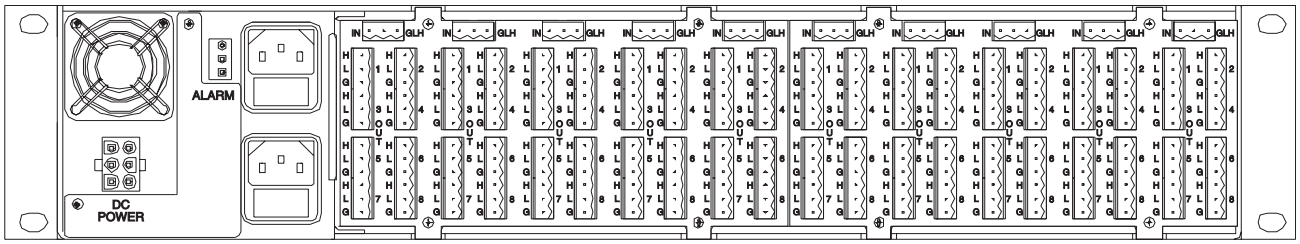


Figure 2-7 DA3000 Audio Mainframe Rear Panel

Alarm Connector

The alarm connector and fan are disabled when PS45 Audio Power Supplies are utilized to power the DA3000 Audio Mainframe (standard configuration). When PS70A Power Supplies are utilized to power the DA3000 Audio Mainframe (optional configuration) the alarm circuit, contained in PS70A Power Supply circuitry, acts as a switch to trigger an optional external alarm in the event of a failure in the power supply or of the external 110VAC (220VAC for the international version) source. The alarm circuit supplies a closure voltage to the external alarm but does not provide an operating voltage to the external alarm. The alarm connector, located on the backplane, allows connection of the external alarm. The fan is also enabled when PS70A Power Supplies are installed in the DA3000 Audio Mainframe.

2.10 Rear Panel Connectors Continued:

DC Power Connector

Power can be supplied to the DA3000 Audio Mainframe through an externally mounted power supply or from internal power supplies. The DC Power Connector can be used as DC power input (external power supply) or as DC power output (internal power supplies) to allow the audio distribution amplifier frame to power additional equipment items.

Audio Input and Output Connectors

There are ten audio input connectors located on the rear panel of the DA3000 Audio Mainframe. There are also ten groups of audio output connectors located on the rear panel. Each of these groups contain eight audio output connectors.

2.11 DA3000 Audio Mainframe System Connections

Once the DA3000 Audio Mainframes are installed in the equipment racks, system connections can be made. Use the following guide and the sample system connections illustration, Figure 2-8, to insure that the DA3000 Audio Mainframe system connections are hooked up correctly.

Connection Guide

1. Connect the audio sources to the audio inputs.

2. Connect the audio destinations to the audio outputs.

3. Connect the primary power supply to the AC line.

4. If a redundant internal AC power supply is utilized, connect it to the AC line.

5. If an external power supply is to be included in the system configuration, connect it to the DC input/output connector and then connect it to the AC line.

The DA3000 Audio Mainframe should now be powered up and ready for operation.

2.11 DA3000 Audio Mainframe System Conn. Cont:

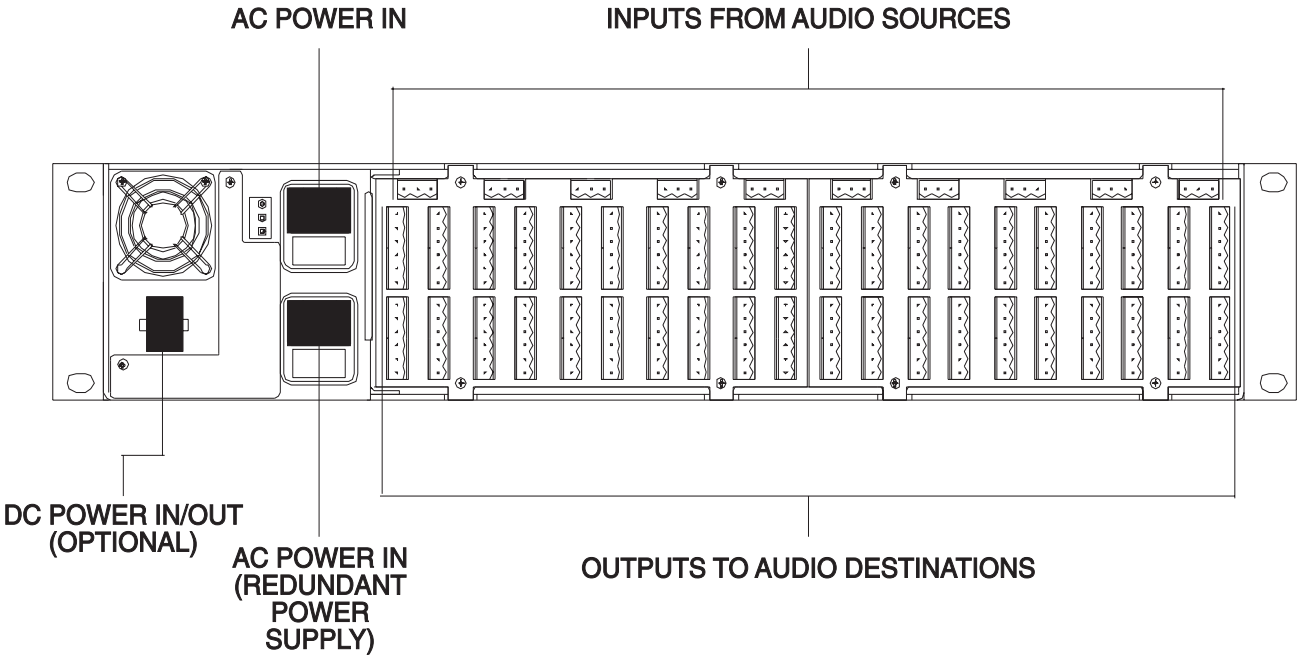


Figure 2-8 Sample System Connections

3.1 Introduction

The operation of the DA3000 Audio Mainframe consists of applying power to the chassis and monitoring the associated audio distribution amplifier cards and power supplies. This section describes the operation and adjustment of each type of audio distribution amplifier card.

The two types of audio distribution cards currently available are the ADA3001 and the ADA3002 Audio Distribution Amplifier Boards. The ADA3001 is a general purpose audio distribution amplifier designed to operate into a 66 ohm load per output line. The ADA3002 is a general purpose audio distribution amplifier designed to operate into a 600 ohm load per output line.

3.2 ADA3001 Audio Board Operation

The operation of the ADA3001 Audio Distribution Board consists of plugging the board into the DA3000 Audio Mainframe and powering the mainframe up. The operation of the ADA3001 Audio Board also consists of setting the Gain Adjust Range Switch (S1) to the appropriate range. There are no LED indicators located on the ADA3001.

Gain Adjust Range Switch (S1)

The Gain Adjust Range Switch is four position dip switch that allows the customer to select the gain range of the ADA3001 Audio Distribution Amplifier Board. The four switch selectable gain ranges are +6dB, +12dB, +20dB, and +28dB. If no range switch is selected the gain range is unity. See Figure 3-1.

S1 GAIN RANGE SWITCH
(SHOWN WITH +6DB RANGE SELECTED)

Figure 3-1 Gain Adjust Range Switch

3.3 ADA3001 Audio Board Adjustment

Though the ADA3001 Audio Boards are tested and adjusted before shipment from the factory readjustment may be necessary when parts are replaced or equipment configuration changes. Refer to Component Assembly, ADA30001 and ADA3002 Audio Boards, page 6.9 for ADA3001 adjustment locations. To properly test and adjust a ADA3001 Audio Board the following test equipment or equivalent test equipment is needed:

Digital Multimeter
Audio Generator
Oscilloscope
66 Ohm Load
Audio Distortion Analyzer

NOTE

For all of ADA3001 Board adjustments (except CMRR), be sure a balanced system input/output is used.

Voltage (R1 and R32)

The voltage adjustments provide a means of adjusting the output of ADA3001 Board's voltage regulators. To make the voltage adjustments take the following steps:

1. Connect the digital multimeter between pin 3 of U1 and ground. Be careful not to short the pins of U1 together.

2. Set the multimeter to a range of at least 25 volts DC.

3. Adjust R1 until a -24V DC ±0.1V DC reading is obtained on the multimeter.

4. Disconnect the multimeter from pin 3 of U1 and connect it to pin 2 of U2. Leave the ground lead connected.

5. Adjust R32 until a +24V DC ±0.1V DC reading is obtained on the multimeter.

6. Disconnect the multimeter.

3.3 ADA3001 Audio Board Adjustment Continued:

DC Offset (R8)

The DC Offset is adjusted with no input signal applied to the ADA3001 Audio Board. To adjust the DC Offset level take the following steps:

1. Disconnect the input and terminate (or short) the input.

2. Connect the digital multimeter between the plus and minus sides of one of the ADA3001 Board's outputs.

3. Set the multimeter to a low DC voltage range.

4. Adjust R8 until a 0V DC ±20mV DC reading is obtained.

5. Disconnect the digital multimeter from the ADA3001 Board's output.

Common Mode Rejection Ratio CMRR (R35 and R36)

The input common mode rejection ratio adjustment provides a means to eliminate unwanted noise and hum on the audio distribution board's outputs. The CMRR adjustment consists of adjusting both R35 (course adjustment) and R36 (fine adjustment), if included, for a null (lowest) reading. To adjust the CMRR take the following steps:

1. Short the high side of the audio board's input to the low side of its input.

2. Connect the audio generator to the audio analyzer.

2. Adjust the audio generator for a 14V RMS (40V P-P) maximum signal at 60Hz on the audio analyzer.

3. Disconnect the audio generator from the audio analyzer.

4. Connect the high side of the audio generator's output to the short between the audio board's signal input high and low. Connect the low side of audio generator's output to ground (3rd pin on the input connector).

5. Connect the audio distortion analyzer to one of the audio distribution board's outputs.

6. Adjust R35 (course adjustment) for a null (lowest) reading on the audio distortion analyzer.

3.3 ADA3001 Audio Board Adjustment Continued:

Common Mode Rejection Ratio CMRR (R35 and R36) Continued:

7. Adjust R36, if provided, (fine adjustment) for a null (lowest) reading on the audio distortion analyzer.

8. Disconnect all test equipment and remove the input short.

Gain (R4 and R17)

The gain adjustments enable the customer to adjust the level of the output signal to match the level of the input signal (unity gain) or to a customer preferred output level between -6dB and +31dB . Making the gain adjustment consists of setting Gain Adjust Range Switch to the preferred range and adjusting R17 (course adjustment) and R4 (fine adjustment) for the desired output level. To adjust the gain for unity take the following steps:

1. Adjust the audio generator for a 0dB output at 1KHz.

2. Connect the audio generator to the audio distribution board's input connector.

3. Connect the audio analyzer to one of the audio distribution board's outputs.

4. Adjust R17 (course adjustment) for around a 0dB reading at 1KHz on the audio analyzer.

5. Adjust R4 (fine adjustment) for a OdB reading at 1KHz on the audio analyzer.

6. Disconnect all test equipment.

3.4 ADA3002 Audio Board Operation

The operation of the ADA3002 Audio Distribution Board consists of plugging the board into the DA3000 Audio Mainframe and powering the mainframe up. The operation of the ADA3002 Audio Board also consists of setting the Gain Adjust Range Switch (S1) to the appropriate range. There are no LED indicators located on the ADA3002.

3.4 ADA3002 Audio Board Operation Continued:

Gain Adjust Range Switch (S1)

The Gain Adjust Range Switch is four position dip switch that allows the customer to select the gain range of the ADA3002 Audio Distribution Amplifier Board. The four switch selectable gain ranges are +6dB, +12dB, +20dB, and +28dB. If no range switch is selected the gain range is unity. See Figure 3-2.

S1 GAIN RANGE SWITCH
(SHOWN WITH +6DB RANGE SELECTED)

Figure 3-2 Gain Adjust Range Switch

3.5 ADA3002 Audio Board Adjustment

Though the ADA3002 Audio Boards are tested and adjusted before shipment from the factory readjustment may be necessary when parts are replaced or equipment configuration changes. Refer to Component Assembly, ADA3001 and ADA3002 Audio Boards, page 6.9 for ADA3002 adjustment locations. To properly test and adjust a ADA3002 Audio Board the following test equipment or equivalent test equipment is needed:

Digital Multimeter
Audio Generator
Oscilloscope
600 Ohm Load
Audio Distortion Analyzer

NOTE

For all of ADA3002 Board adjustments (except CMRR), be sure a balanced system input/output is used.

3.5 ADA3002 Audio Board Adjustment Continued:

Voltage (R1 and R32)

The voltage adjustments provide a means of adjusting the output of ADA3002 Board's voltage regulators. To make the voltage adjustments take the following steps:

1. Connect the digital multimeter between pin 3 of U1 and ground. Be careful not to short the pins of U1 together.

2. Set the multimeter to a range of at least 25 volts DC.

3. Adjust R1 until a -24V DC ±0.1V DC reading is obtained on the multimeter.

4. Disconnect the multimeter from pin 3 of U1 and connect it to pin 2 of U2. Leave the ground lead connected.

5. Adjust R32 until a +24V DC ±0.1V DC reading is obtained on the multimeter.

6. Disconnect the multimeter.

DC Offset (R8)

The DC Offset is adjusted with no input signal applied to the ADA3002 Audio Board. To adjust the DC Offset level take the following steps:

1. Disconnect the input and terminate (or short) the input.

2. Connect the digital multimeter between the plus and minus sides of one of the ADA3002 Board's outputs.

3. Set the multimeter to a low DC voltage range.

4. Adjust R8 until a 0V DC ±20mV DC reading is obtained.

5. Disconnect the digital multimeter from the ADA3002 Board's output.

3.5 ADA3002 Audio Board Adjustment Continued:

Common Mode Rejection Ratio CMRR (R35 and R36)

The input common mode rejection ratio adjustment provides a means to eliminate unwanted noise and hum on the audio distribution board's outputs. The CMRR adjustment consists of adjusting both R35 (course adjustment) and R36 (fine adjustment), if included, for a null (lowest) reading. To adjust the CMRR take the following steps:

1. Short the high side of the audio board's input to the low side of its input.

2. Connect the audio generator to the audio analyzer.

2. Adjust the audio generator for a 14V RMS (40V P-P) maximum signal at 60Hz on the audio analyzer.

3. Disconnect the audio generator from the audio analyzer.

4. Connect the high side of the audio generator's output to the short between the audio board's signal input high and low. Connect the low side of audio generator's output to ground (3rd pin on the input connector).

5. Connect the audio distortion analyzer to one of the audio distribution board's outputs.

6. Adjust R35 (course adjustment) for a null (lowest) reading on the audio distortion analyzer.

7. If included, adjust R36 (fine adjustment) for a null (lowest) reading on the audio distortion analyzer.

8. Disconnect all test equipment and remove the input short.

3.5 ADA3002 Audio Board Adjustment Continued:

Gain (R4 and R17)

The gain adjustments enables the customer to adjust the level of the output signal to match the level of the input signal (unity gain) or to a customer preferred output level between -3dB and +31dB . Making the gain adjustment consists of setting Gain Adjust Range Switch to the preferred range and adjusting R17 (course adjustment) and R4 (fine adjustment) for the desired output level. To adjust the gain for unity take the following steps:

1. Adjust the audio generator for a 0dB output at 1KHz.

2. Connect the audio generator to the audio distribution board's input connector.

3. Connect the audio analyzer to one of the audio distribution board's outputs. Terminate the output into 600 ohms.

4. Adjust R17 (course adjustment) for around a 0dB reading at 1KHz on the audio analyzer.

5. Adjust R4 (fine adjustment) for a OdB reading at 1KHz on the audio analyzer.

6. Disconnect all test equipment.

4.1 Introduction

This section contains the functional descriptions of DA3000 Audio Mainframe's electronic circuits. Included in this section are the functional descriptions of the DA3000 Audio Backplane, the associated Audio Distribution Boards, the and the PS45 Power Supply. This manual section is divided into the following major topics:

- DA3000 Audio Backplane
- ADA3001 Audio Board
- ADA3002 Audio Board
- PS45 Audio Power Supply

4.2 DA3000 Audio Backplane

The DA3000 Audio Backplane's electronic circuitry is divided into the input/output circuits and the power distribution circuits. The backplane's function is to provide the passive ins to the individual audio distribution boards, passive outs from the audio distribution boards, and to route power and ground to the individual audio distribution boards. The input/output circuits are repeated ten times on the audio backplane so only one set of input/output circuits are described. Refer to Schematic, DA3000 Audio Backplane, page 6.7.

Input/Output

The input signals are routed through the 3-pin audio input connectors to pins 1 and 17 of the 32-pin circuit card connector. The signal grounds are routed to the audio backplane's ground. The positive audio output signals are tied from pins 5, 6, 7, 9, 10, 12, 13, and 14 of the 32-pin circuit card connector to pin 1 of the respective 3-pin audio output connector. The negative audio output signals are tied from pins 21, 22, 23, 25, 26, 28, 29, and 30 of the 32-pin circuit card connector to pin 2 of the respective 3-pin audio output connector. The output grounds are tied from pins 4, 3, 8, 11, 20, 19, 24, and 27 of the 32-pin circuit card connector to pin 3 of 3-pin audio output connectors.

Power Distribution

The power distribution circuits, located on the audio backplane, route the power supply plus and minus voltages to the associated audio distribution boards. The power distribution circuits are also responsible for the routing of fan and alarm voltages/currents. AC line ground is common with the signal grounds.

4.3 ADA3001 Audio Board

The ADA3001 is a general purpose four stage audio distribution amplifier with a high input impedance and eight 66 ohm outputs. The electronic circuitry of the ADA3001 Audio Distribution Amplifier Board is divided into the power, input, gain, inverter, and output circuits. These are circuits are described in the following paragraphs. Refer to Schematic, ADA3001 and ADA3002 Audio Boards, page 6.10.

Power

The power circuit consists of voltage regulators U1 (-24 volts) and U2 (+24 volts) and their associated components. Positive unregulated DC is feed into U2 through pin 16 of the 32-pin audio board connector (P1). The input current flow is reduced and input power is limited by R60 and filtered by C4. The output voltage level of U2 is adjusted by tuning R32, a variable resistor. The output of U2 is filtered by C6 and other 1uf capacitors located throughout the ADA3001 Board's electronic circuits. Negative unregulated DC is feed into U1 through pin 15 of the 32-pin audio board connector (P1). The input current flow is reduced and input power is limited by R59 and filtered by C2. The output voltage level of U1 is adjusted by tuning R1, a variable resistor. The output of U1 is filtered by C3 and other 1uf capacitors located throughout the ADA3001 Board's electronic circuits.

Input and Gain

The input circuit on the ADA3001 Audio Distribution Board consists of U6 (one-half of dual operational amplifier), U3 (operational amplifier), SW1 (4-position dip switch), and their associated components. The positive audio input signal is feed from pin 1 of P1 through R38 to pin 1 of U6, the input buffer. The negative audio input signal is feed from pin 17 of P1 through R40 to pin 2 of U6. U6 along with variable resistors R35 and R36 provide attenuation to unwanted common mode signals. U3 working inconjunction with SW1 controls and sets the gain and the gain range of the ADA3001 Board. R17 and R4 provide course and fine adjustment of the signal level to U3. The output of U3 is coupled through R16 and R18 to the ADA3001 Board's output circuits. Variable resistor R8 is used to minimize the DC offset of the ADA3001 Board.

4.3 ADA3001 Audio Board Continued:

Inverter and Output

The output circuit consists of two identical output drivers plus an inverter amplifier. The inverter is an unity gain amplifier used to provide a balanced output by inverting the input signal to one of the identical output drivers. The two identical output drivers drive eight loads each. A complimentary transistor pair (Q1 and Q2, Q3 and Q4) provides power for the loads. Drive for these transistor pairs comes from an operational amplifier, U5. An operational output amplifier is required to provide enough drive for the eight loads and to maintain output specifications. Q1, Q2, and U5 form a feedback amplifier. The entire output stage operates at unity gain. The high feedback level insures that the output amplifiers provide stable low distortion amplification with a wide bandwidth.

4.4 ADA3002 Audio Board

The ADA3002 is a general purpose four stage audio distribution amplifier with a 600 ohm input and eight 600 ohm outputs. The electronic circuitry of the ADA3002 Audio Distribution Amplifier Board is divided into the power, input, gain, inverter, and output circuits. These are circuits are described in the following paragraphs. Refer to Schematic, ADA3001 and ADA3002 Audio Boards, page 6.10.

Power

The power circuit consists of voltage regulators U1 (-24 volts) and U2 (+24 volts) and their associated components. Positive unregulated DC is feed into U2 through pin 16 of the 32-pin audio board connector (P1). The input current flow is reduced and input power is limited by R60 and filtered by C4. The output voltage level of U2 is adjusted by tuning R32, a variable resistor. The output of U2 is filtered by C6 and other 1uf capacitors located throughout the ADA3002 Board's electronic circuits. Negative unregulated DC is feed into U1 through pin 15 of the 32-pin audio board connector (P1). The input current flow is reduced and input power is limited by R59 and filtered by C2. The output voltage level of U1 is adjusted by tuning R1, a variable resistor. The output of U1 is filtered by C3 and other 1uf capacitors located throughout the ADA3002 Board's electronic circuits.

4.3 ADA3001 Audio Board Continued:

Input and Gain

The input circuit on the ADA3002 Audio Distribution Board consists of U6 (one-half of dual operational amplifier), U3 (operational amplifier), SW1 (4-position dip switch), and their associated components. The positive audio input signal is feed from pin 1 of P1 through R38 to pin 1 of U6, the input buffer. The negative audio input signal is feed from pin 17 of P1 through R40 to pin 2 of U6. U6 along with variable resistors R35 and R36 provide attenuation to unwanted common mode signals. U3 working inconjunction with SW1 controls and sets the gain and the gain range of the ADA3002 Board. R17 and R4 provide course and fine adjustment of the signal level to U3. The output of U3 is coupled through R16 and R18 to the ADA3002 Board's output circuits. Variable resistor R8 is used to minimize the DC offset of the ADA3002 Board.

Inverter and Output

The output circuit consists of two identical output drivers plus an inverter amplifier. The inverter is an unity gain amplifier used to provide a balanced output by inverting the input signal to one of the identical output drivers. The two identical output drivers drive eight loads each. A complimentary transistor pair (Q1 and Q2, Q3 and Q4) provides power for the loads. Drive for these transistor pairs comes from an operational amplifier, U5. An operational output amplifier is required to provide enough drive for the eight loads and to maintain output specifications. Q1, Q2, and U5 form a feedback amplifier. The entire output stage operates at unity gain. The high feedback level insures that the output amplifiers provide stable low distortion amplification with a wide bandwidth.

4.5 PS45 Audio Power Supply

The PS45 Audio Power Supply is an unregulated power source that supplies plus and minus DC voltages to DA3000 Audio Mainframe and the associated circuit cards. Both the 115VAC (US) and 220VAC (OUS) models of the PS45 Audio Power Supply are similar in design so only one model is discussed here. Refer to Schematic, Power Supply PCB (US), page 6.12 and to Schematic, Power Supply PCB (OUS), page 6.14.

4.5 PS45 Audio Power Supply Continued:

Circuit Description

The AC line and AC neutral are connected to T1 and T2 (step down transformers) through input fuses. The signal ground is coupled to the chassis ground through C3. T1 and T2 decrease the AC line voltage and drive the full-wave rectifier composed of D1 through D4. The unregulated output of the full-wave rectifier is filtered by C1 and C2. R2 and R3 supply a minimum power supply load if the DA3000 Audio Mainframe is empty. After the filters, series diodes are used (D5, D6, D8, and D9) to allow the power supply to be paralleled for redundancy. The series diodes insure that one power supply cannot load the output of another power supply placed in parallel in case of a shorted power supply diode or filtering capacitor. A sensing circuit comprised of R1, D7 (a zener diode), and CR1 (a green light emitting diode) senses the voltages across the filter capacitors and output resistors. The green LED (CR1), located on the power supply front panel, serves as rough indicator of the power supply output voltage levels; it dims as the positive and negative output voltage levels decrease. If the combined outputs decrease by approximately 25% from nominal, the green LED will be extinguished. The PS45 Audio Power Supply is unregulated and will follow input line changes and output load variations.

5.1 Maintenance

The DA3000 Audio Mainframe, the Audio Distribution Boards, and the PS45A Power Supplies are designed and manufactured to give long, trouble free service with minimum maintenance requirements. If problems do occur, follow the troubleshooting procedure provided in this section. If additional technical assistance is required, refer to the General Assistance and Service information in the front of the manual. Section 6 contains component layout drawings and schematics for assistance in troubleshooting and Section 7 contains the lists of replacement parts for repairing the DA3000 Audio Mainframe, the Audio Distribution Boards, and the PS45A Power Supplies.

5.2 Preventive Maintenance

Use the following guidelines for general preventive maintenance:

NOTICE

THIS EQUIPMENT CONTAINS STATIC SENSITIVE DEVICES. IT IS RECOMMENDED THAT A GROUNDED WRIST STRAP AND MAT BE USED WHILE MAKING REPAIRS OR ADJUSTMENTS.

- Keep the inside of the frame clean, especially if your facility is subject to dust or dirt in the atmosphere. Use compressed air, an antistatic cloth, or an antistatic vacuum to clean the frame and internal components.
- Observe proper procedures for preventing electrostatic discharge when cleaning the unit, and when inserting and removing cards. Ensure that all tools and personnel handling individual components are properly grounded.
- If a problem is suspected with an individual Audio Distribution Board, first swap out the board and recheck the system for the problem.

5.3 Test Equipment

The test equipment recommended for servicing the DA3000 Audio Mainframe, the Audio Distribution Boards, and the PS45A Power Supplies is listed below. Equivalent test equipment may be used.

Digital Multimeter
Audio Generator
Oscilloscope
66 Ohm Load
660 Ohm Load
Audio Distortion Analyzer

5.4 Corrective Maintenance

The following paragraphs provide information to assist the servicing technician in maintenance of the DA3000 Audio Mainframe, the Audio Distribution Boards, and the PS45A Power Supplies.

Factory Repair Service

If desired, equipment or boards may be returned to the factory (transportation prepaid) for repair. Refer to the General Assistance and Service information sheet in the front of this manual. Call the PESA Service Department for a RMA number before shipping an equipment item.

Pack the equipment securely and label with the correct address. Proper packaging saves money. Be sure to use antistatic packaging or wrap the board in aluminum foil. The small amount of extra care and time it takes to cushion a part or unit properly may prevent costly damage while in transit. Make certain that the address is both legible and complete. Failure to do so often results in delay or even loss.

5.4 Corrective Maintenance Continued:

Troubleshooting

The best troubleshooting tool is a familiarity with the equipment and a through understanding of its operation. Before troubleshooting the DA3000 Audio Mainframe, the Audio Distribution Boards, or the PS45A Power Supplies review sections 3 and 4 of this manual. Use the functional descriptions and adjustment procedures to quickly locate problems. If all of the audio outputs from a DA3000 Audio Mainframe are missing, check the PS45A Power Supply System and the power supply line fuses. See Section 5.5 for fuse replacement details. If some of the audio outputs from a DA3000 Audio Mainframe are missing, check the operation and adjustment of the individual Audio Distribution Board whose outputs are missing. If the problem can be isolated on the board itself, and your facility is equipped for component level repair, proceed with repairs using the schematics provided in Section 6 of this manual.

NOTE

Do not attempt to repair equipment that is in warranty. If the equipment is in warranty follow the procedures found under Factory Repair Service.

Replacement Parts

Only parts of the highest quality have been used in the design and manufacture of the DA3000 Audio Mainframe, the Audio Distribution Boards, and the PS45A Power Supplies. If the inherent stability and reliability are to be maintained, replacement parts must be of the same quality. A replacement parts list is provided in Section 7 of this manual. When replacing parts, avoid using excessive solder on the printed circuit board. Always make sure that the solder does not short two circuits together. Be sure the replacement part is identical to the original, and is placed in exactly the same position.

5.5 Power Supply Fuse Replacement

Replacement of the two power supply fuses is accomplished by disconnecting power to the unit, removing the power supply and disassembling the fuse holder on the rear of the supply. The replacement value of the power supply fuses is 630mA (5x20mm) for a line voltage of 115VAC and 315 mA for a line voltage of 220VAC. Be sure to use the same voltage rating and type of fuses for replacements. See Figure 5-1.

5.5 Power Supply Fuse Replacement Continued:

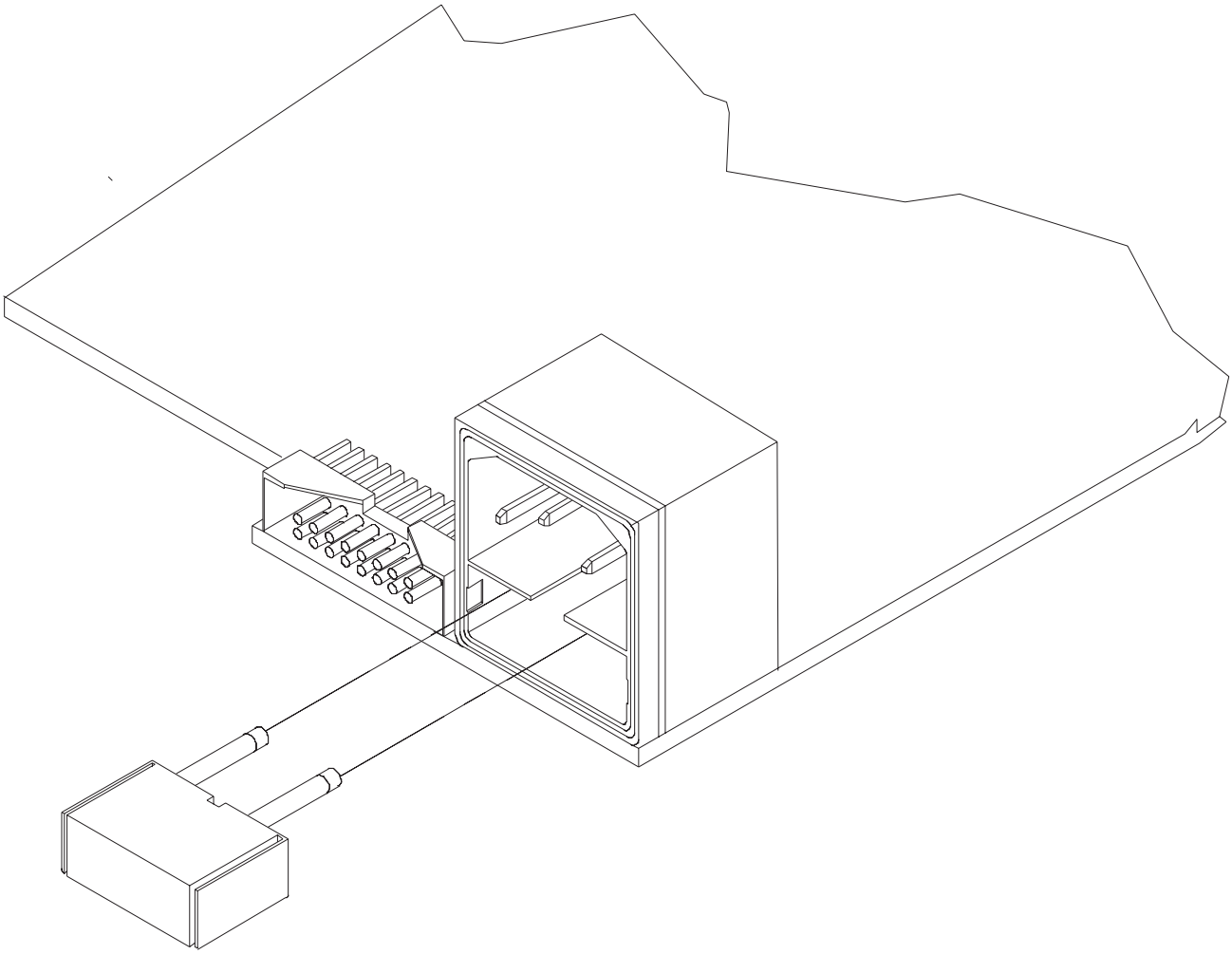


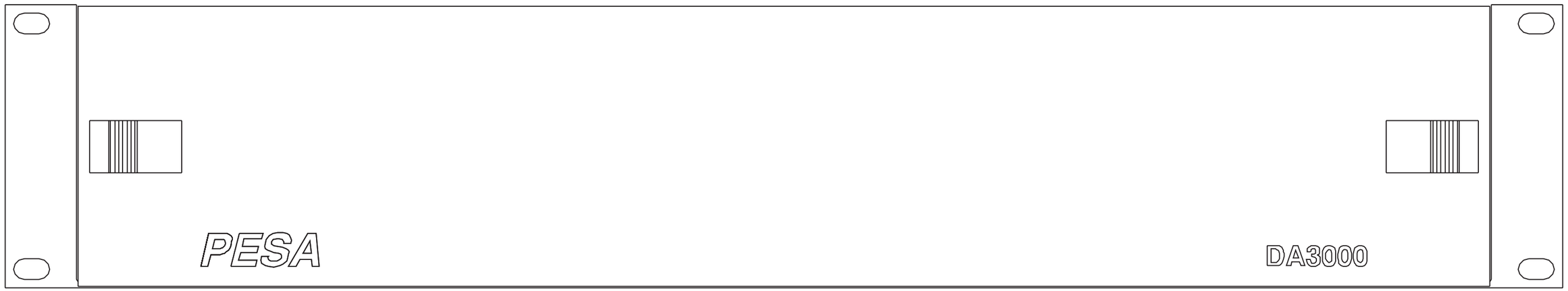
Figure 5-1 Fuse Location on the PS45A Power Supply

6.1 Schematics

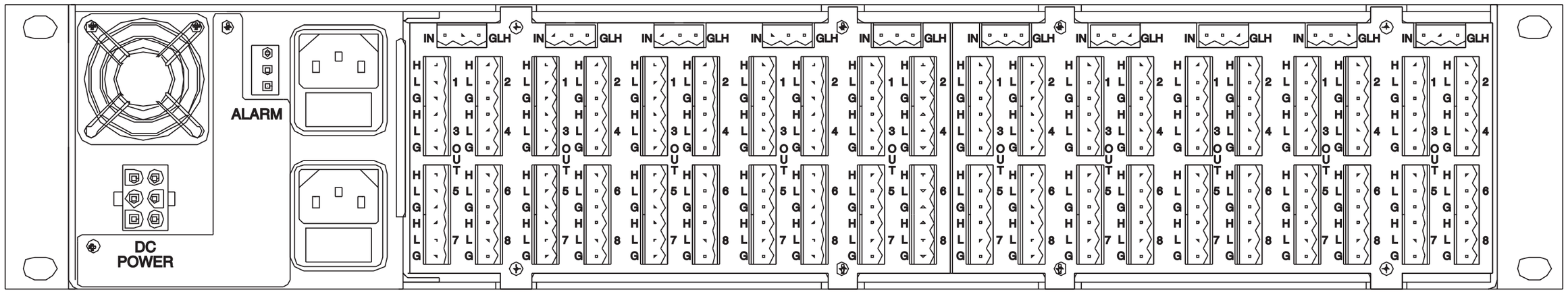
General

This section contains the schematic diagrams and parts location diagrams for the DA3000 Audio Mainframe. Please refer to this section when troubleshooting the equipment or replacing defective parts.

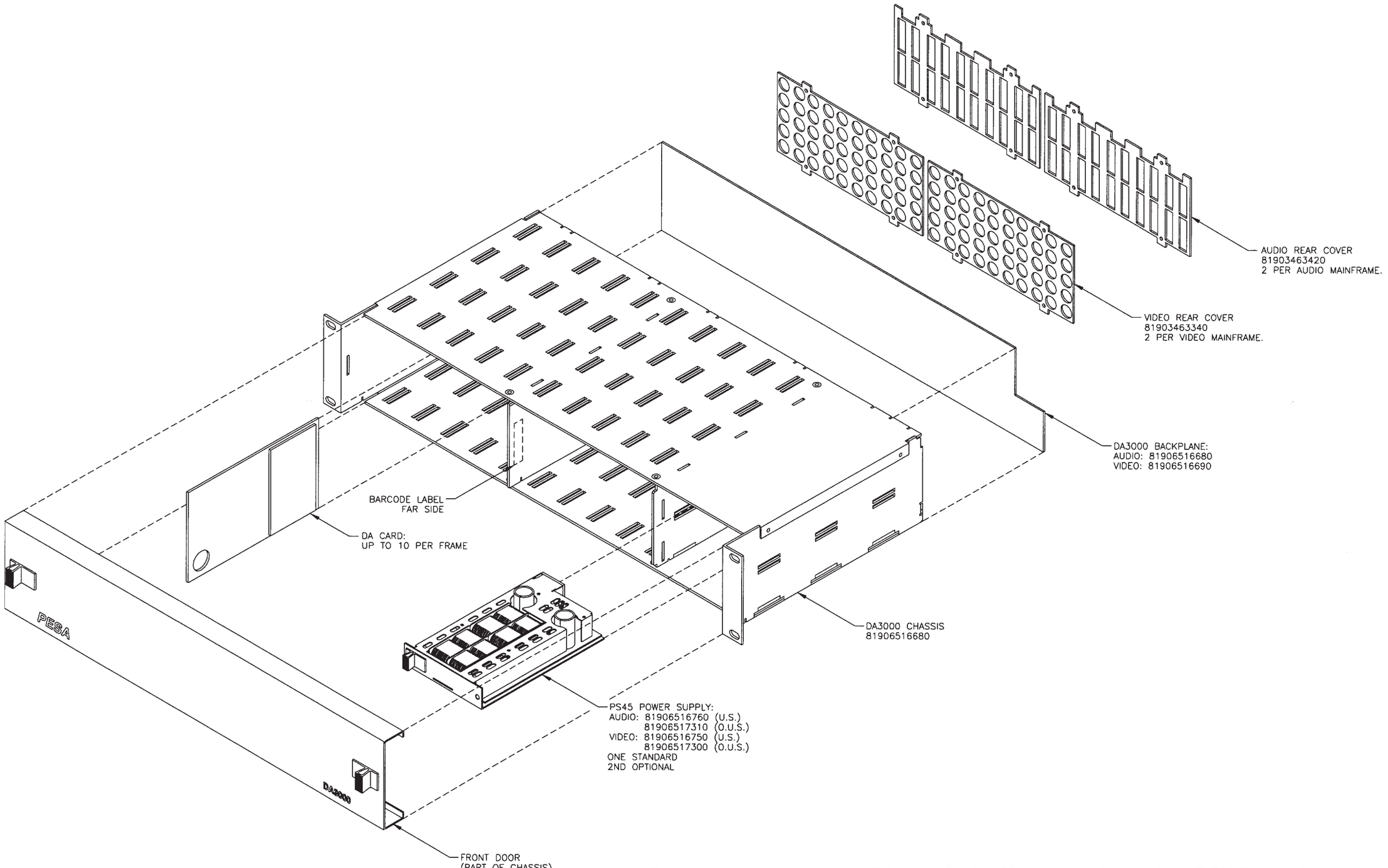
Description	Dwg No.	Page No.
DA3000 Audio Mainframe Front View		6.2
DA3000 Audio Mainframe Rear View		6.3
DA3000 Audio Mainframe Assembly	CD63-0738	6.4
DA3000 Audio Backplane	CA25-1242	6.6
	SC33-1242	6.7
DA3000 Chassis Assembly	CD63-0739	6.8
ADA3001 and ADA3002 Audio Boards	CA25-1244	6.9
	SC33-1244	6.11
Power Supply PCB (US)	CA25-1245	6.13
	SC33-1245	6.14
Power Supply PCB (OUS)	CA25-1272	6.15
	SC33-1272	6.16



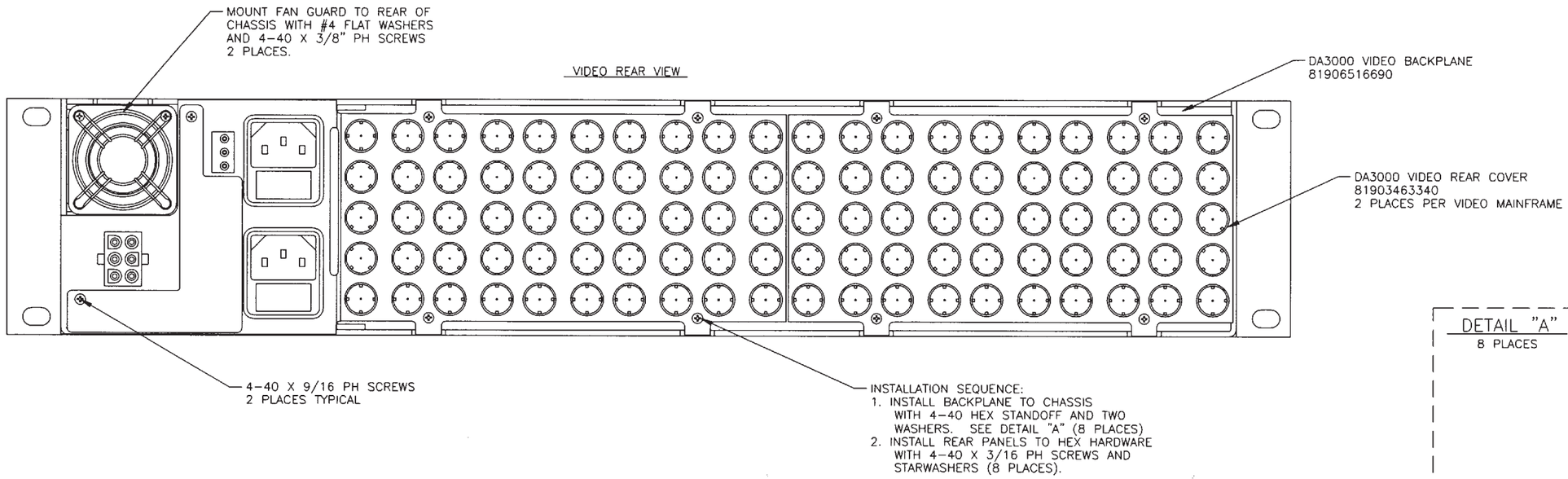
DA3000 Audio Mainframe Front View

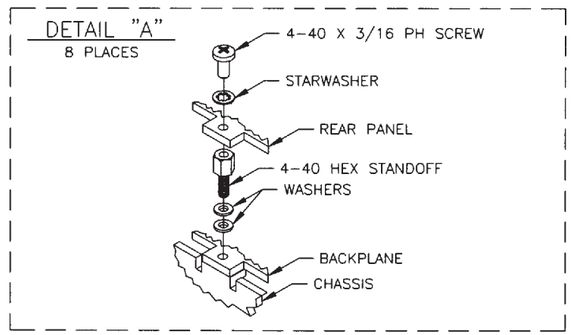


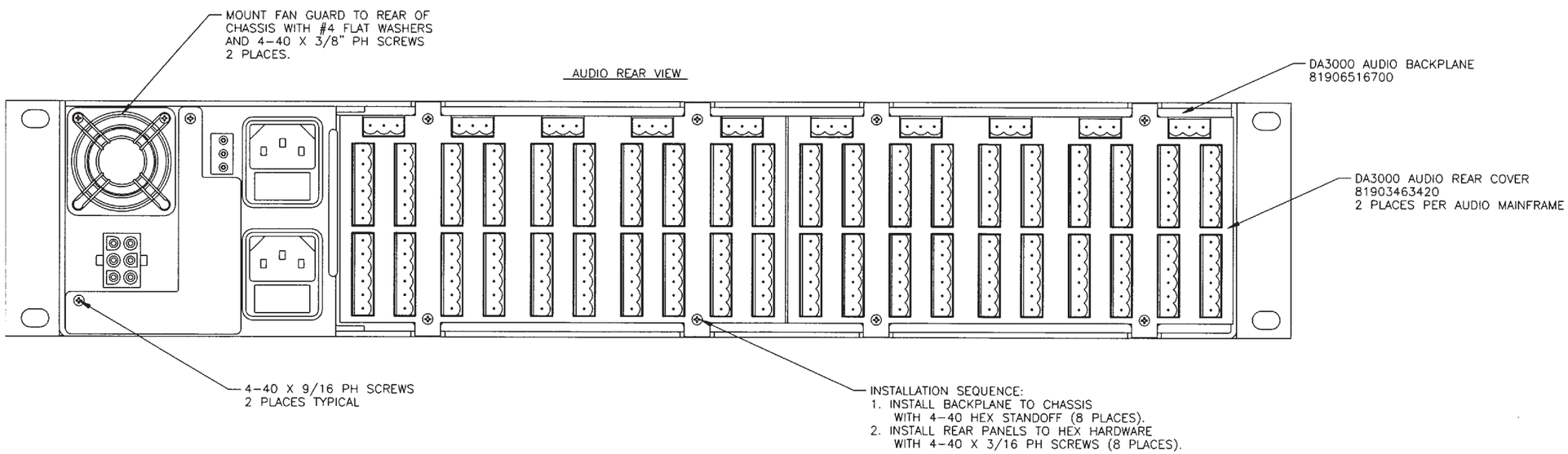
DA3000 Audio Mainframe Rear View



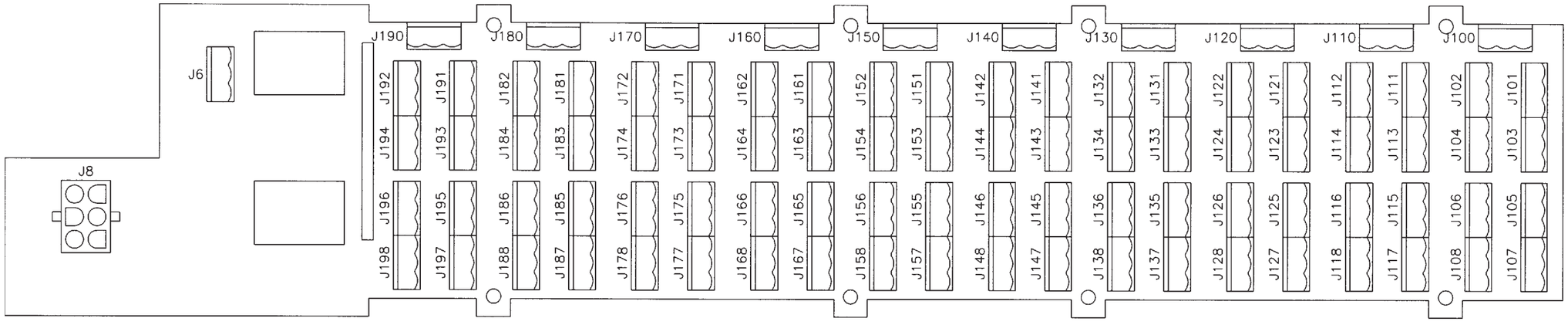
Configuration Drawing (Sheet 1 of 2) • DA3000 Audio Mainframe Assembly (REV B) • CA63-0738



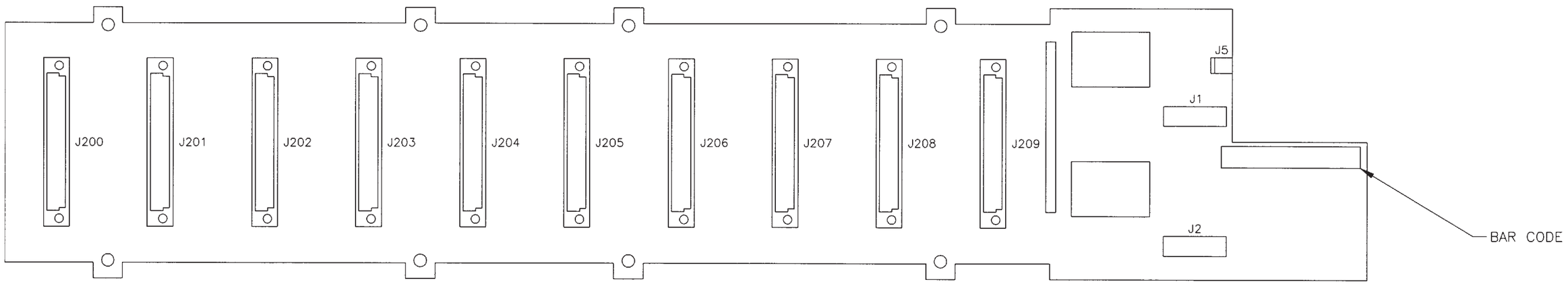




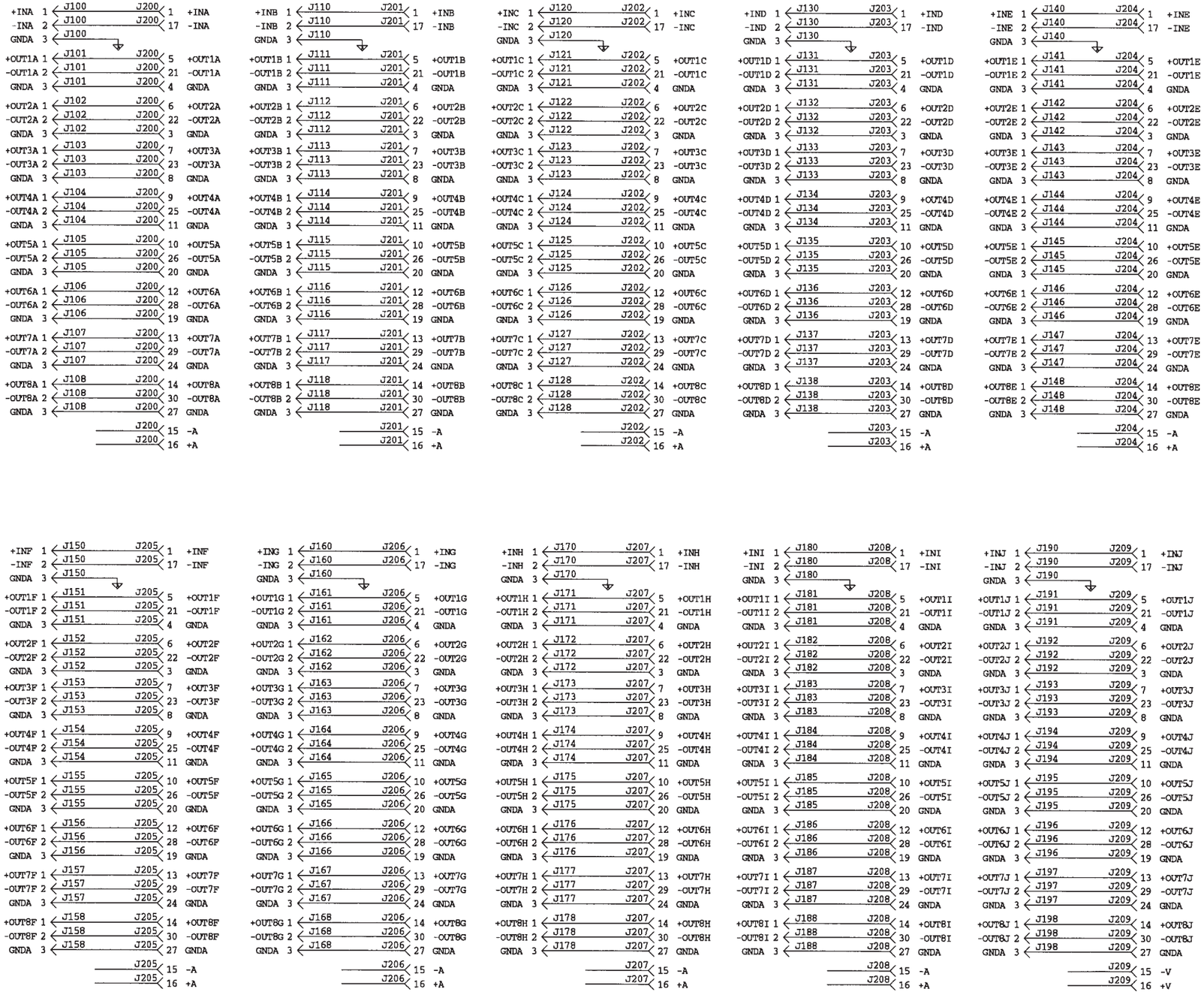
Configuration Drawing (Sheet 2 of 2) • DA3000 Audio Mainframe Assembly (REV B) • CA63-0738

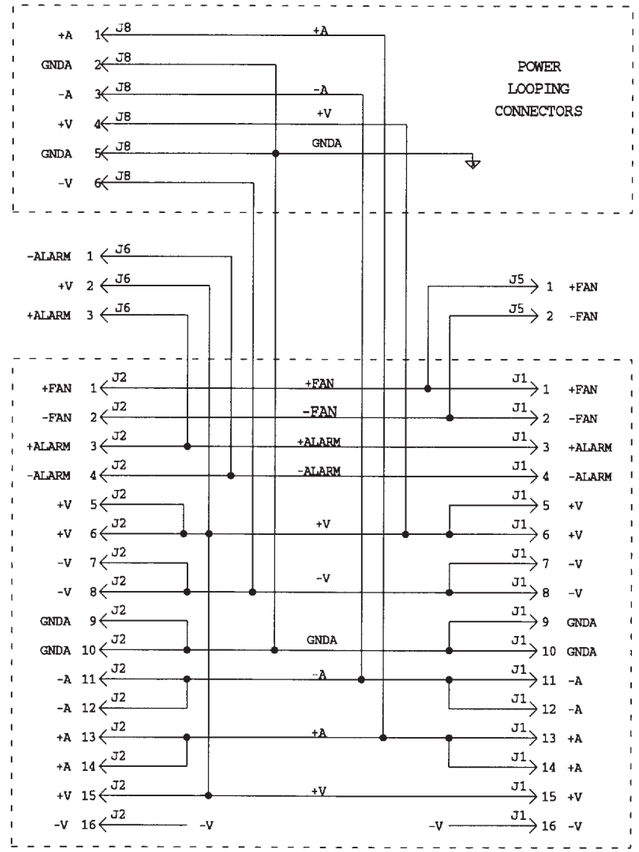


SOLDER SIDE (2 OF 2)



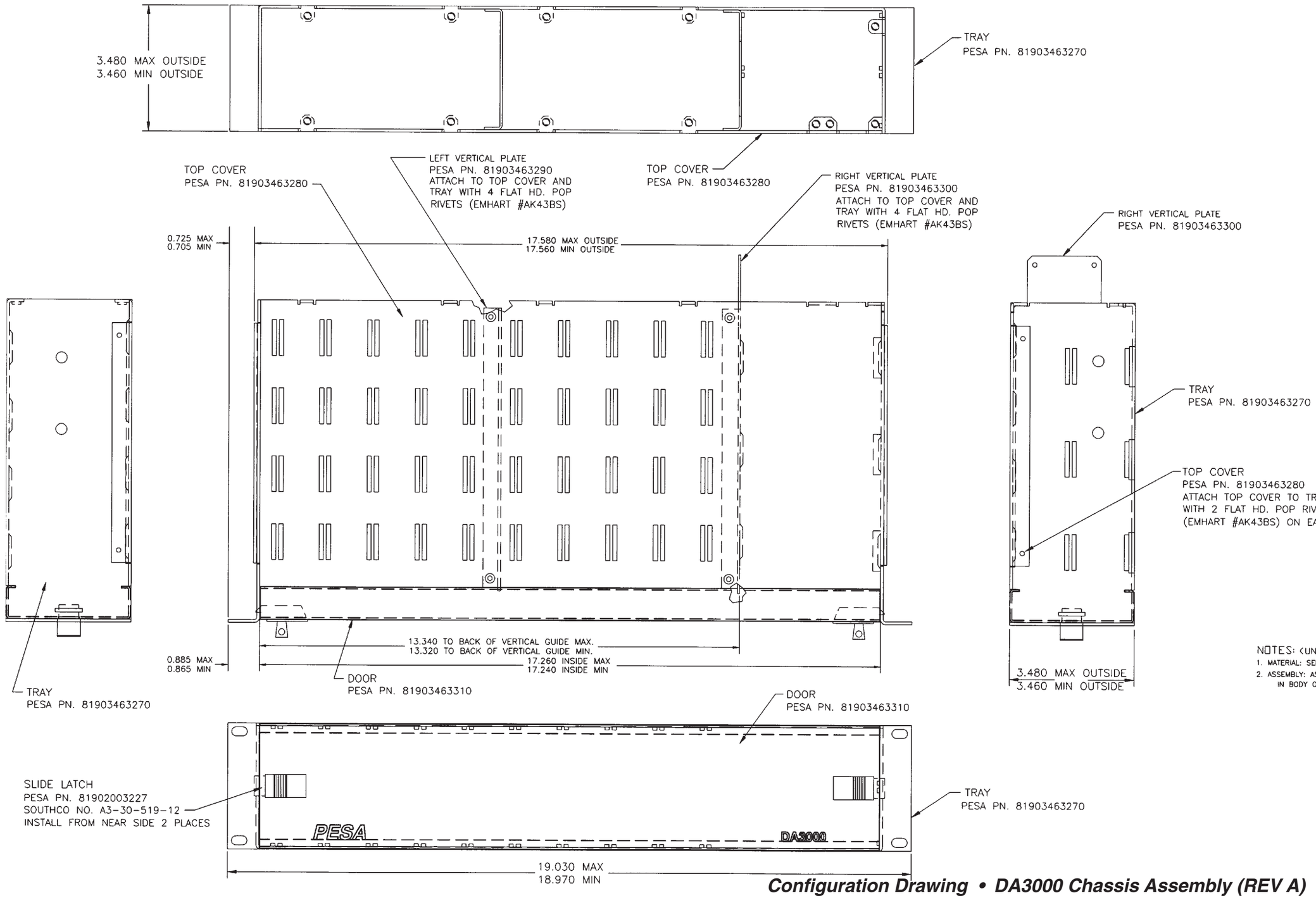
COMPONENT SIDE (1 OF 2)





NOTES: (UNLESS OTHERWISE SPECIFIED)
1. ON CONNECTORS J200-J209
PINS NOT USED = 2, 18, 31, 32

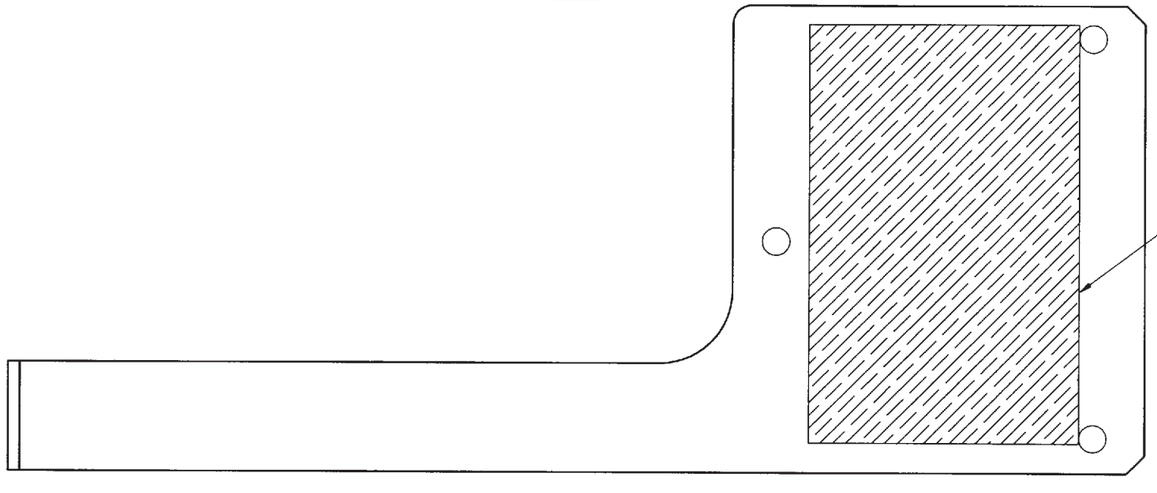
Schematic • DA3000 Audio Backplane (REV B) • SC33-1242



Configuration Drawing • DA3000 Chassis Assembly (REV A) • CD63-0739

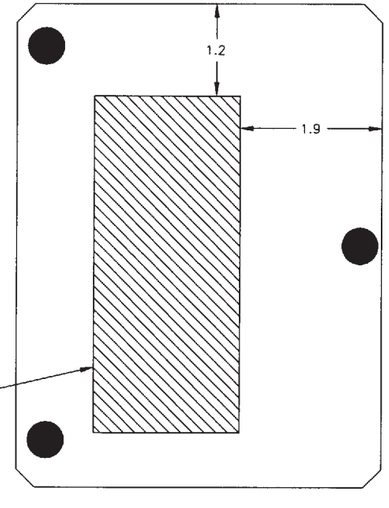
CHANGES FOR REV A-06 PCB

BEFORE ATTACHING PCBOARD TO SHIELD:



CLEAN BOTH PIECES OF METAL WITH FLUX REMOVER BEFORE ASSEMBLY. PLACE ALUMINUM SPACER, 81903465170 ON SHIELD, 81903463610 AS SHOWN. SECURE SPACER TO ALUMINUM SHIELD WITH 4 DROPS OF #498 LOCKTITE.

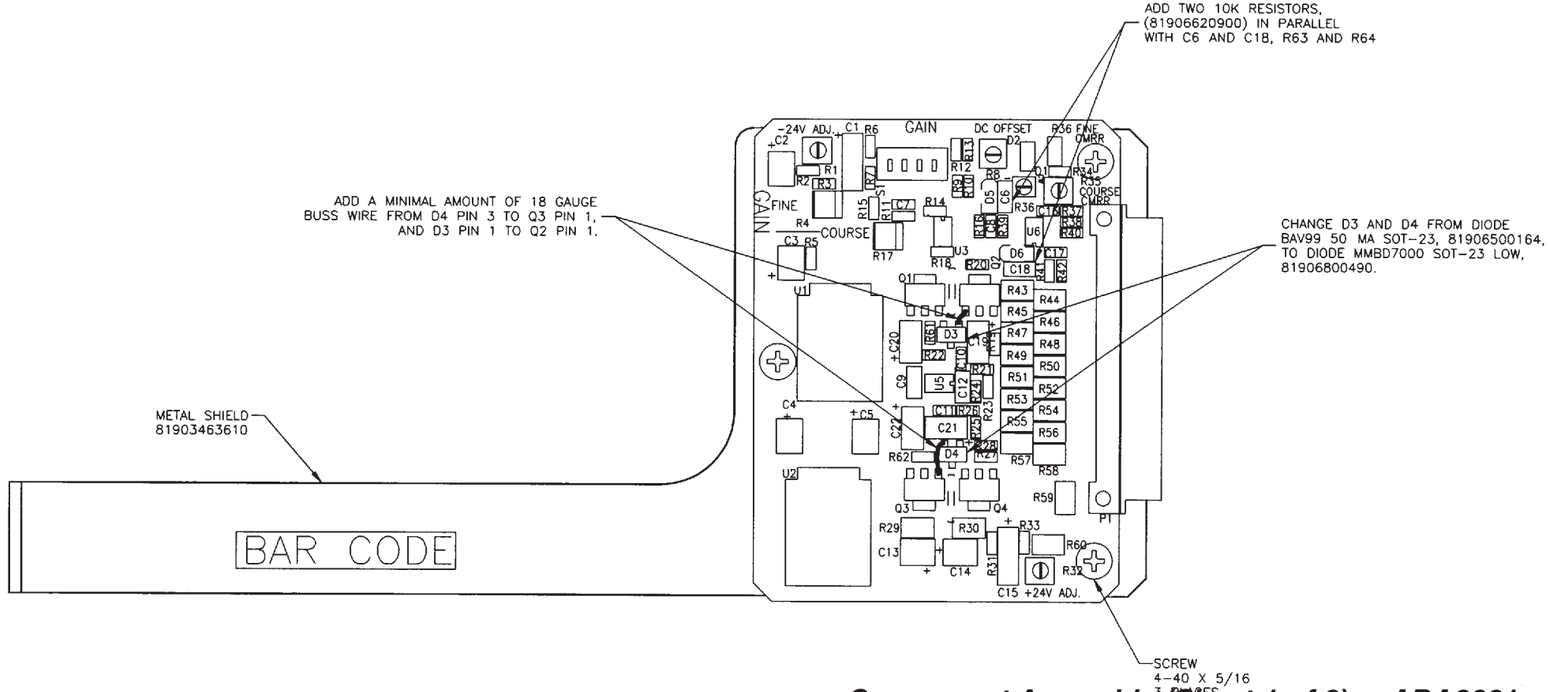
ATTACH HEAT SINK PAD, 81902105540 TO BOTTOM OF PCBOARD AS SHOWN. APPLY BY USING ADHESIVE BACKING OF PAD. DO NOT USE LOCKTITE.



ADD TWO 10K RESISTORS, (81906620900) IN PARALLEL WITH C6 AND C18, R63 AND R64

ADD A MINIMAL AMOUNT OF 18 GAUGE BUSS WIRE FROM D4 PIN 3 TO Q3 PIN 1, AND D3 PIN 1 TO Q2 PIN 1.

CHANGE D3 AND D4 FROM DIODE BAV99 50 MA SOT-23, 81906500164, TO DIODE MMBD7000 SOT-23 LOW, 81906800490.



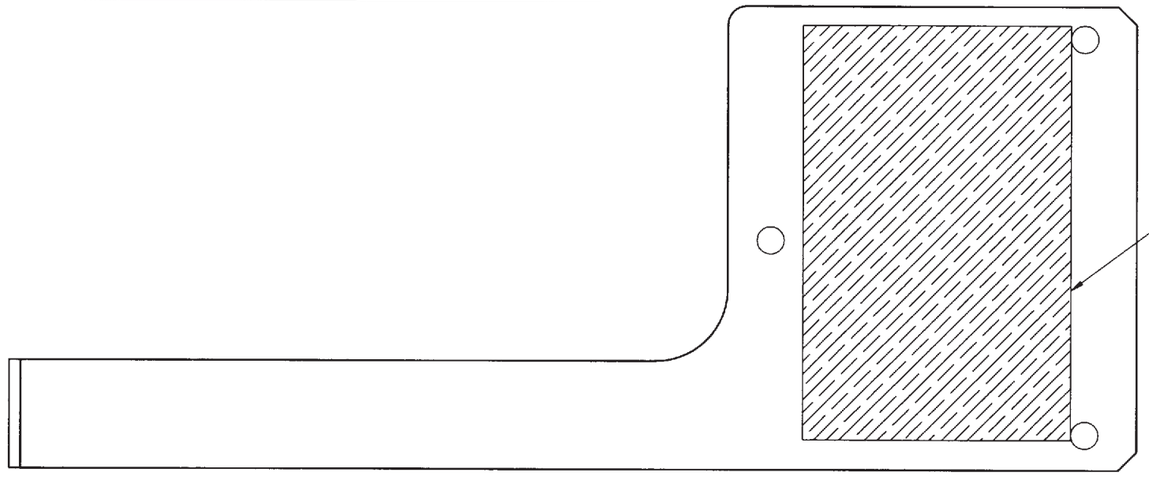
SCREW 4-40 X 5/16 3 PLACES

Component Assembly (Sheet 1 of 2) • ADA3001 and ADA3002 Audio Boards (REV B) • CA25-1244

CHANGES FOR REV A-04 PCB

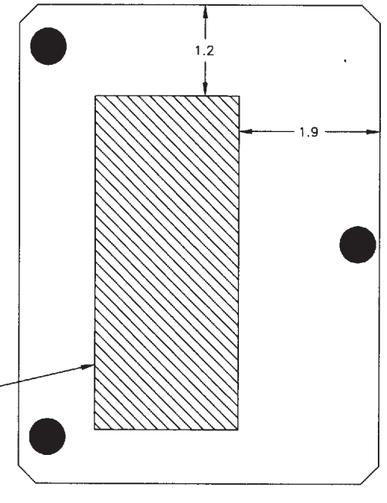
SEE PAGE 1 OF 2 FOR REVISION BLOCK

BEFORE ATTACHING PCBOARD TO SHIELD:

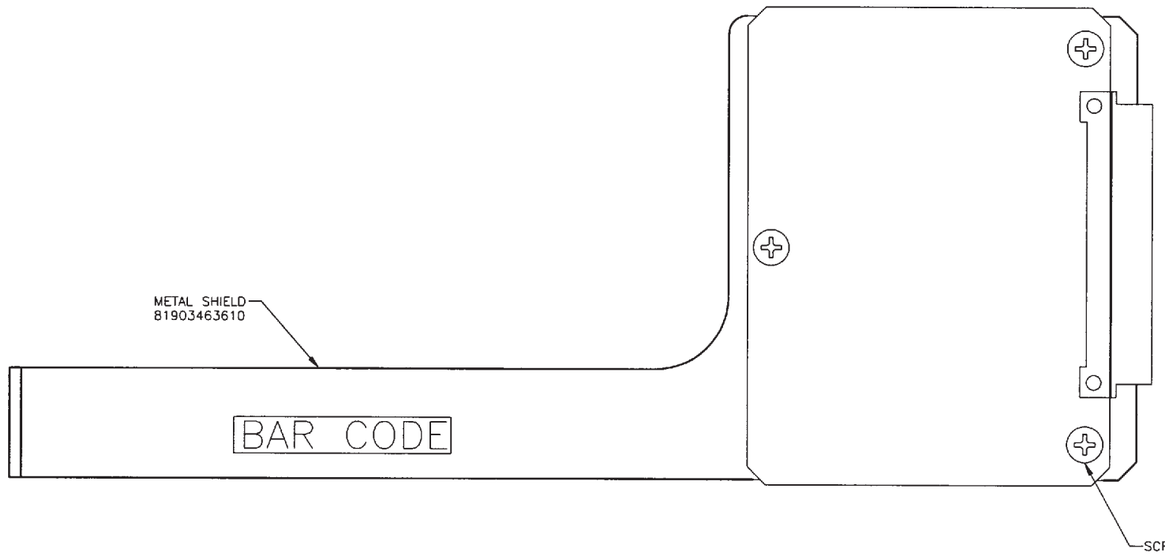


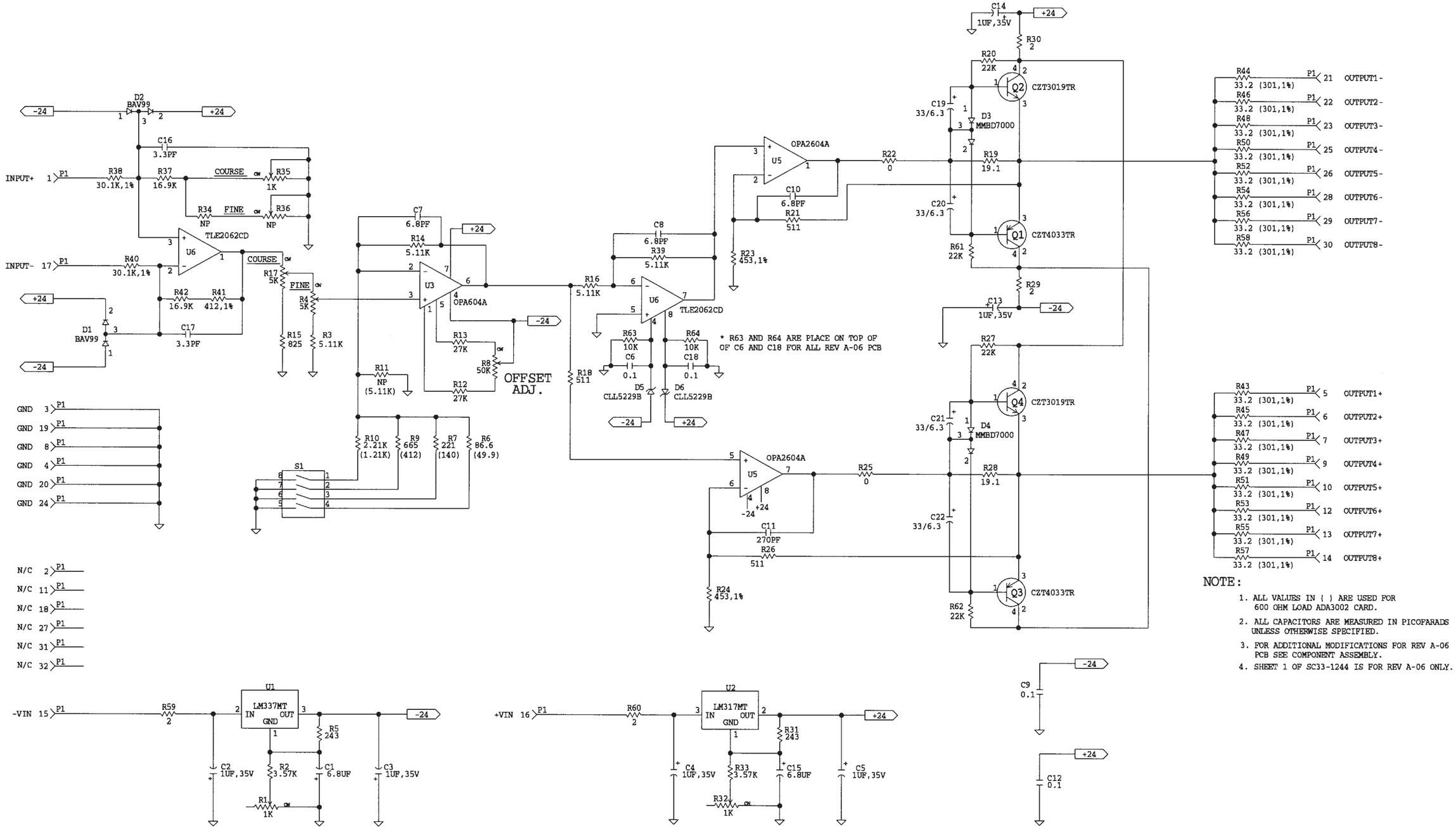
CLEAN BOTH PIECES OF METAL WITH FLUX REMOVER BEFORE ASSEMBLY. PLACE ALUMINUM SPACER, 81903465170 ON SHIELD, 81903463610 AS SHOWN. SECURE SPACER TO ALUMINUM SHIELD WITH 4 DROPS OF #498 LOCKTITE.

ATTACH HEAT SINK PAD, 81902105540 TO BOTTOM OF PCBOARD AS SHOWN. APPLY BY USING ADHESIVE BACKING OF PAD. DO NOT USE LOCKTITE.



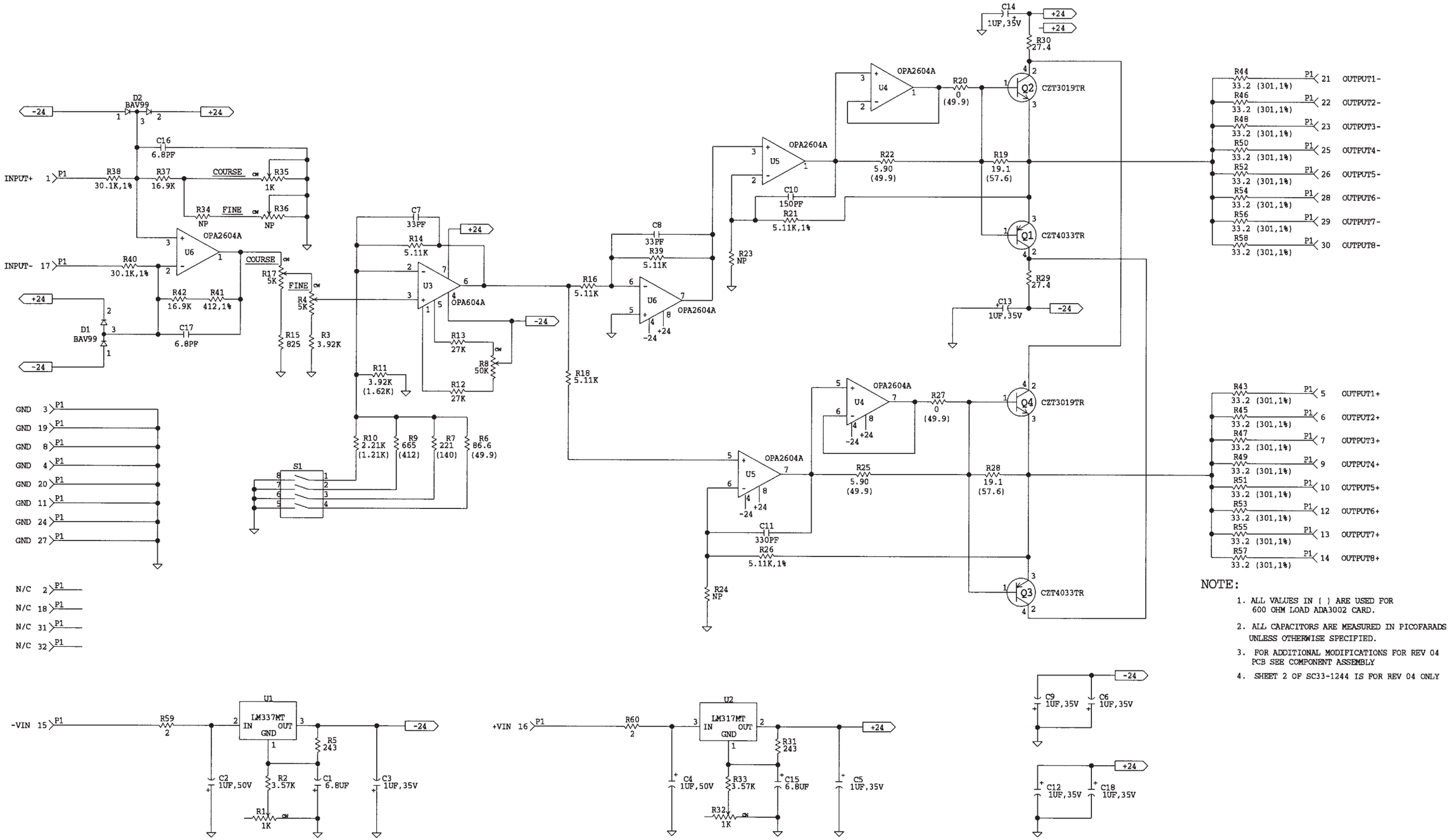
NO MODIFICATIONS TO PCBOARD REV A-04 REQUIRED.





1

Schematic (Sheet 1 of 2) • ADA3001 and ADA3002 Audio Boards (REV D) • SC33-1244

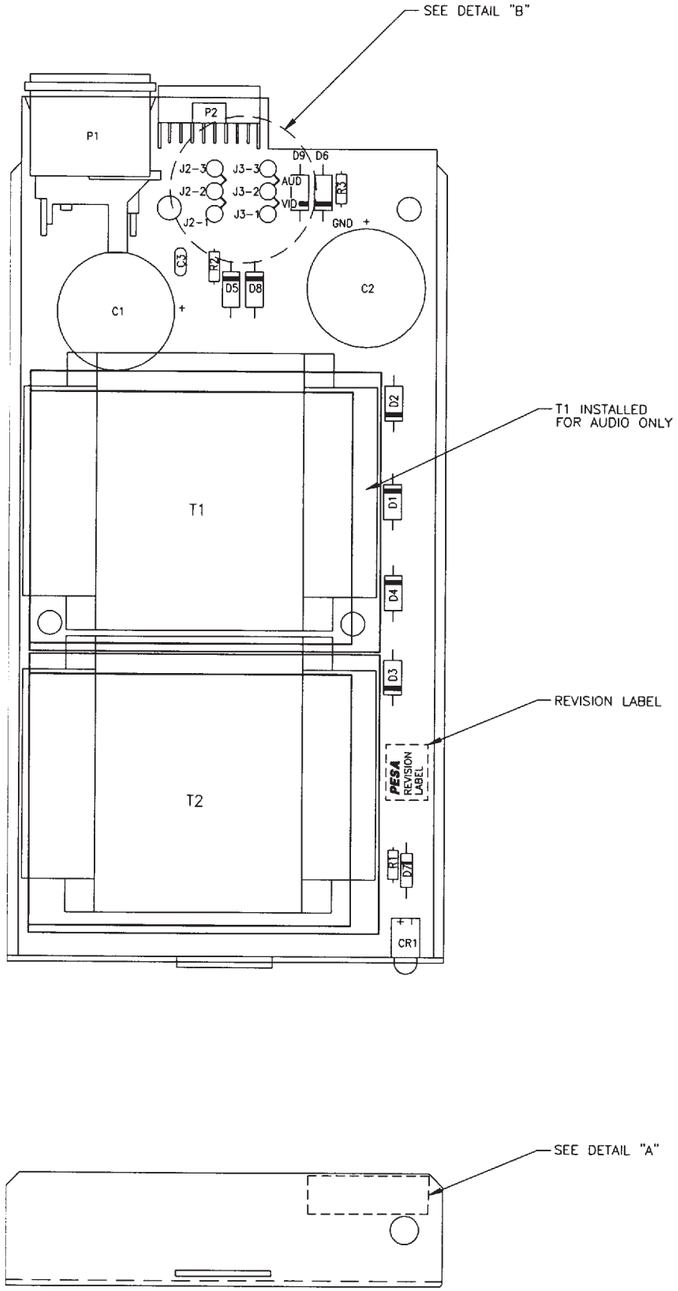


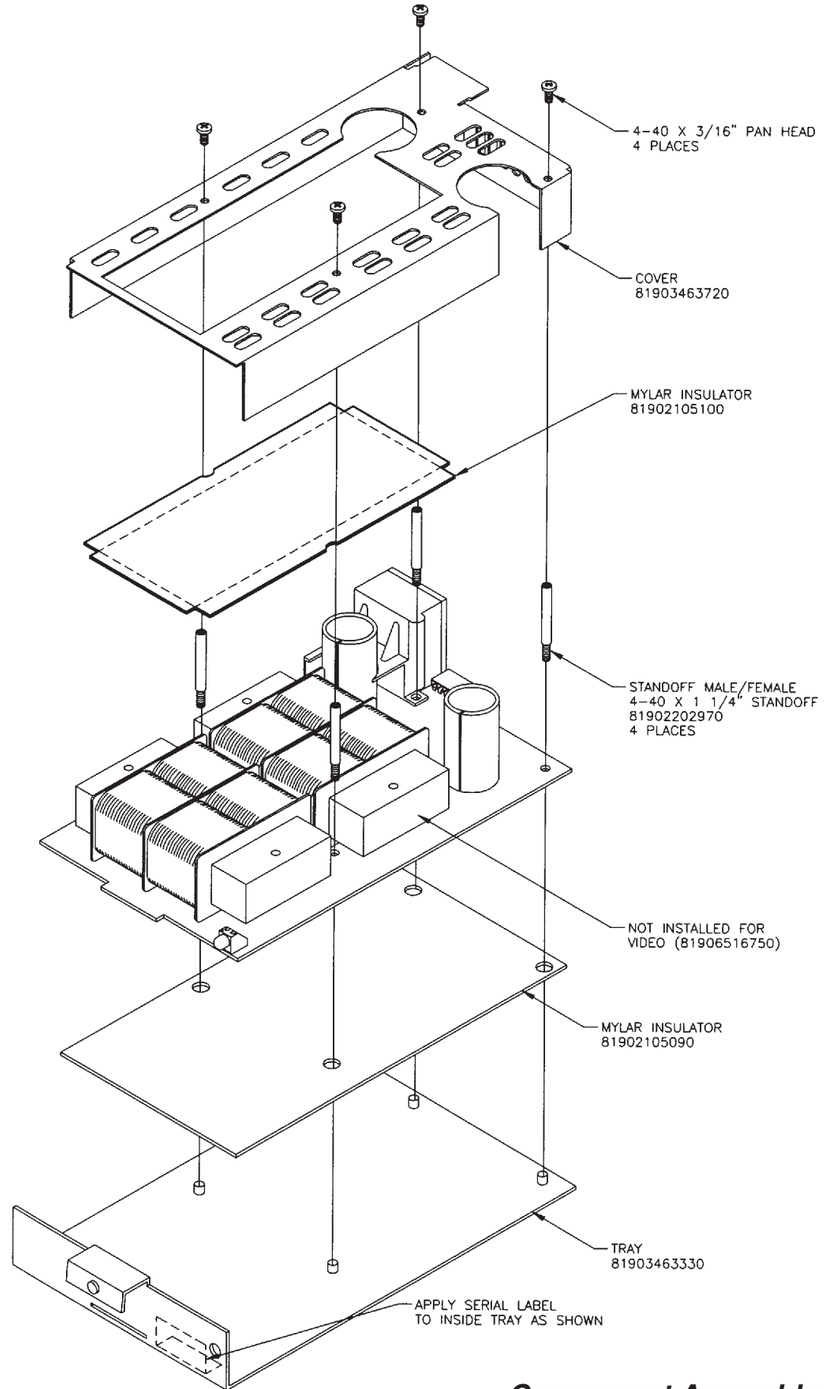
NOTE:

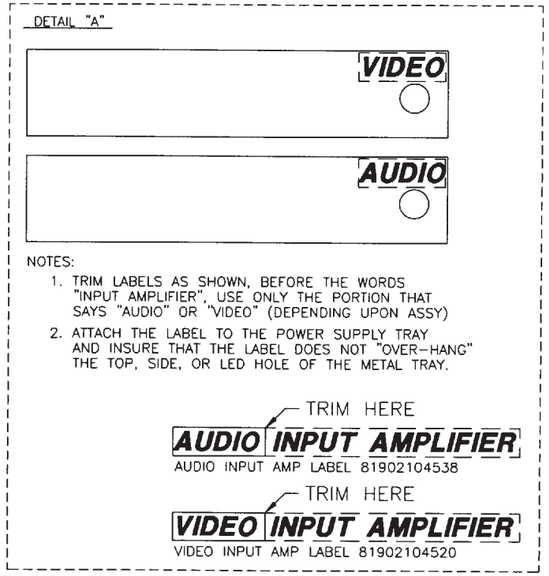
1. ALL VALUES IN ( ) ARE USED FOR 600 OHM LOAD ADA3002 CARD.
2. ALL CAPACITORS ARE MEASURED IN PICOFARADS UNLESS OTHERWISE SPECIFIED.
3. FOR ADDITIONAL MODIFICATIONS FOR REV 04 PCB SEE COMPONENT ASSEMBLY
4. SHEET 2 OF SC33-1244 IS FOR REV 04 ONLY

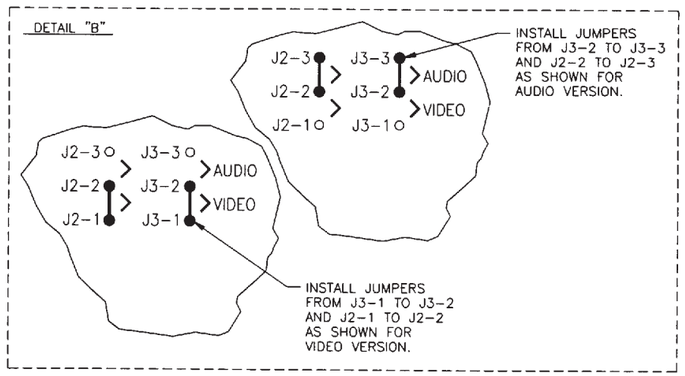
2

Schematic (Sheet 2 of 2) • ADA3001 and ADA3002 Audio Boards (REV D) • SC33-1244

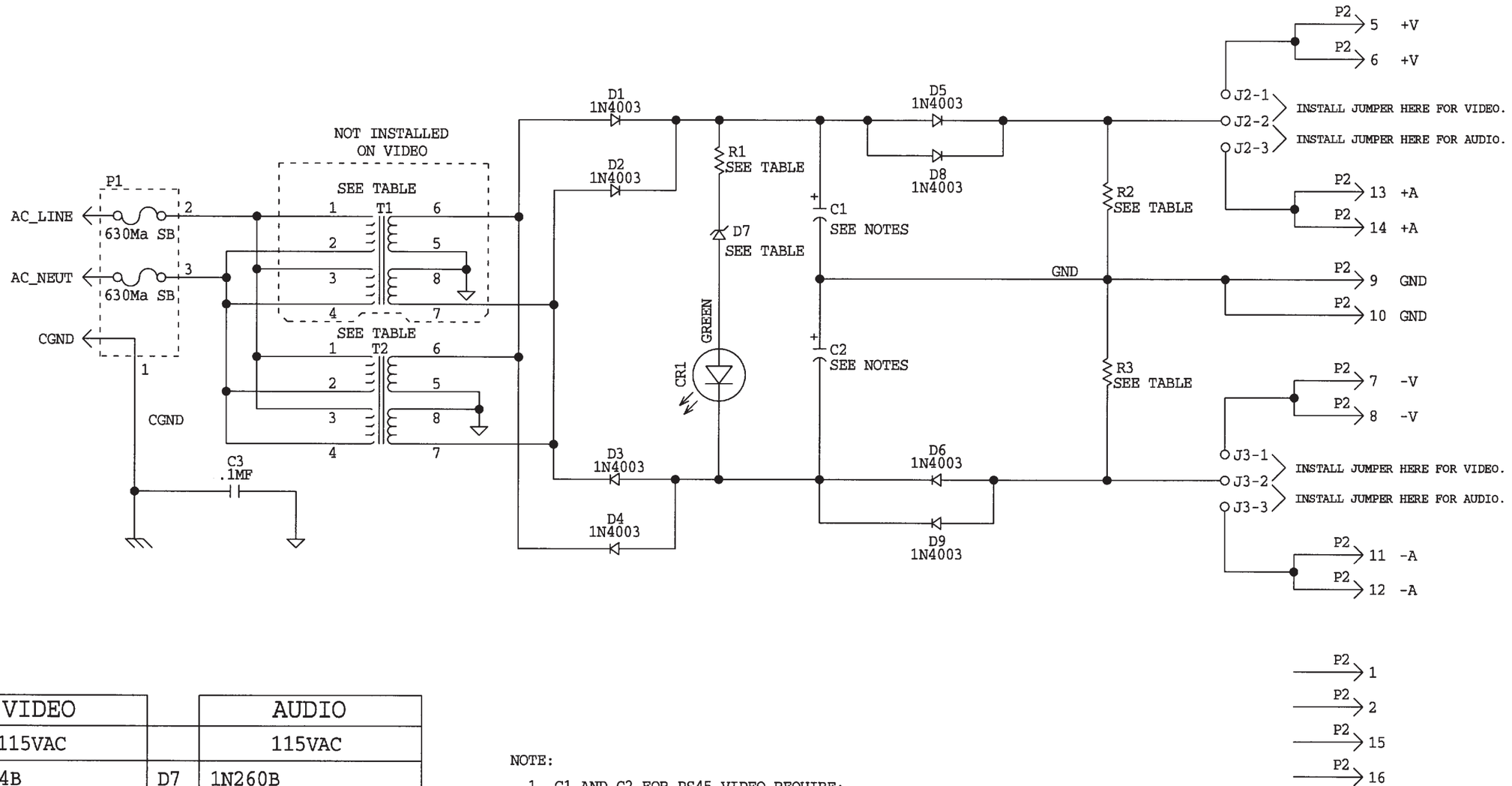








Component Assembly • Power Supply PCB (US) (REV 07) • CA25-1245

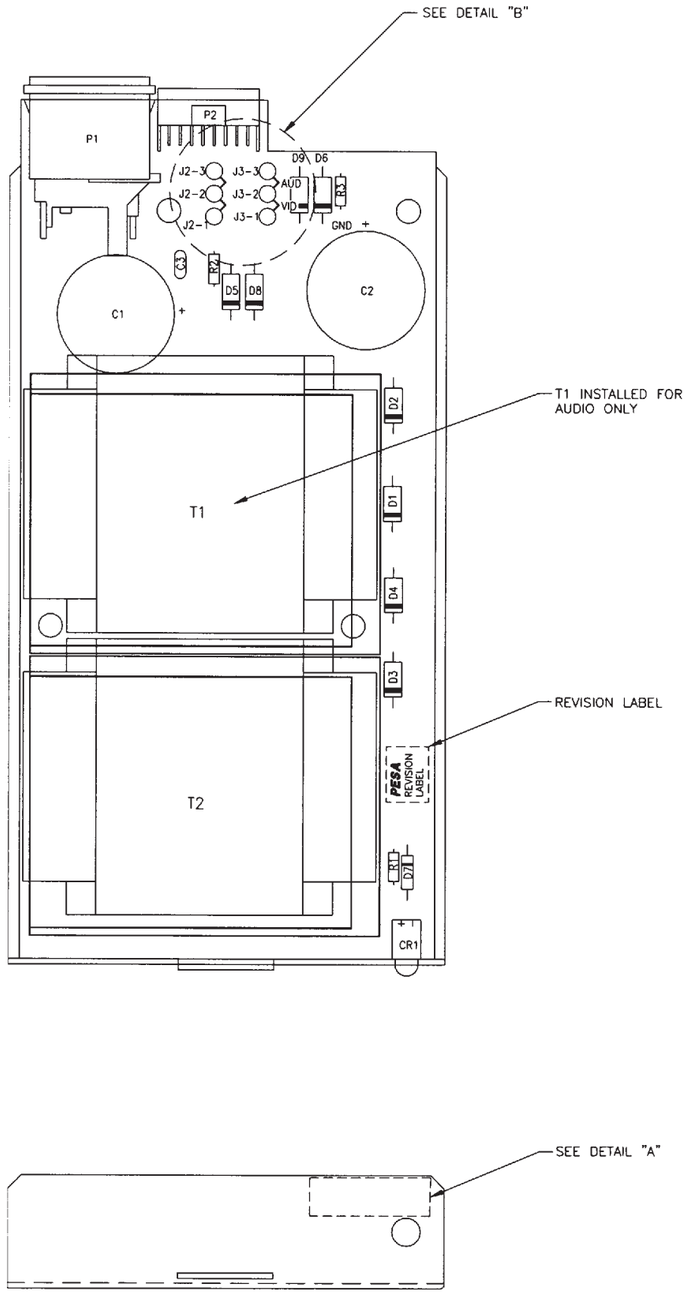


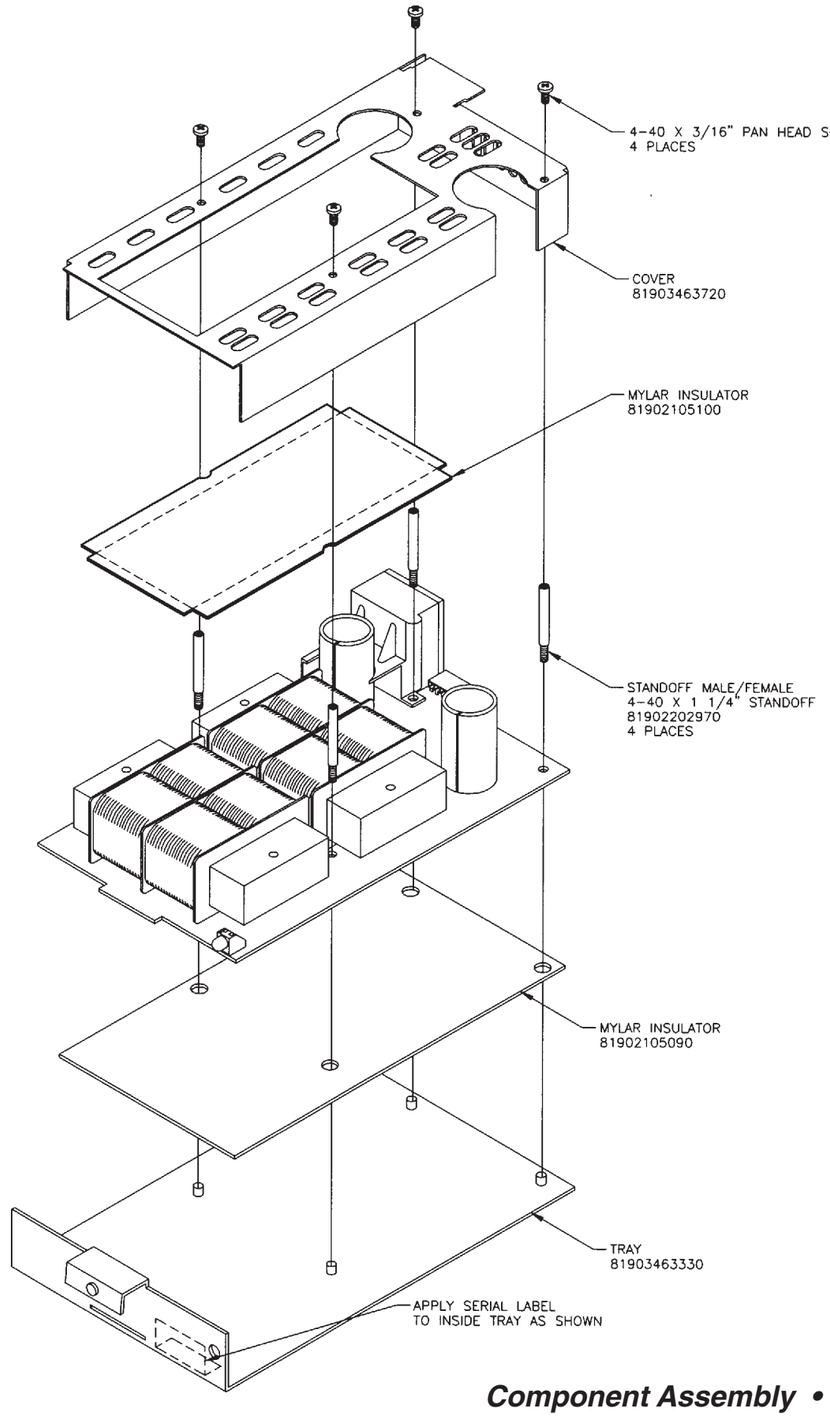
	VIDEO		AUDIO
	115VAC		115VAC
D7	1N5244B	D7	1N260B
R1	560 OHM 5% 1/4w	R1	1500 OHM 5% 1/4w
R2	560 OHM 5% 1/4w	R2	6800 OHM 5% 1/4w
R3	560 OHM 5% 1/4w	R3	6800 OHM 5% 1/4w
T1	NOT PLACED	T1	48VA 40V 1.2A
T2	48VA @ 2.4A 20V	T2	48VA 40V 1.2A

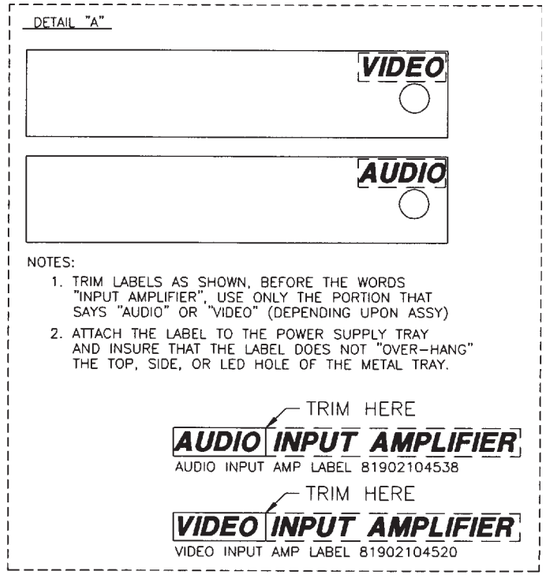
NOTE:

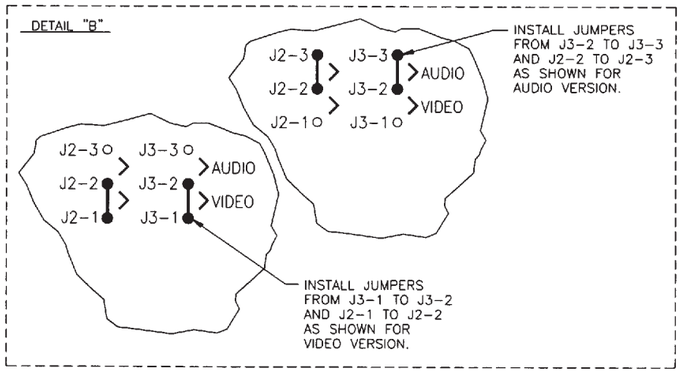
1. C1 AND C2 FOR PS45 VIDEO REQUIRE:
   MINIMUM 15 WORKING VOLTS
   NOMINAL 10,000uF OR GREATER
   MINIMUM 2.2 AMPS RIPPLE CURRENT
   MAXIMUM DIMENSION 25MM(D) X 35MM(L)

2. C1 AND C2 FOR PS45 AUDIO REQUIRE:
   MINIMUM 50 WORKING VOLTS
   NOMINAL 4700uF OR GREATER
   MINIMUM 2.2 AMPS RIPPLE CURRENT
   MAXIMUM DIMENSION 25MM(D) X 35MM(L)

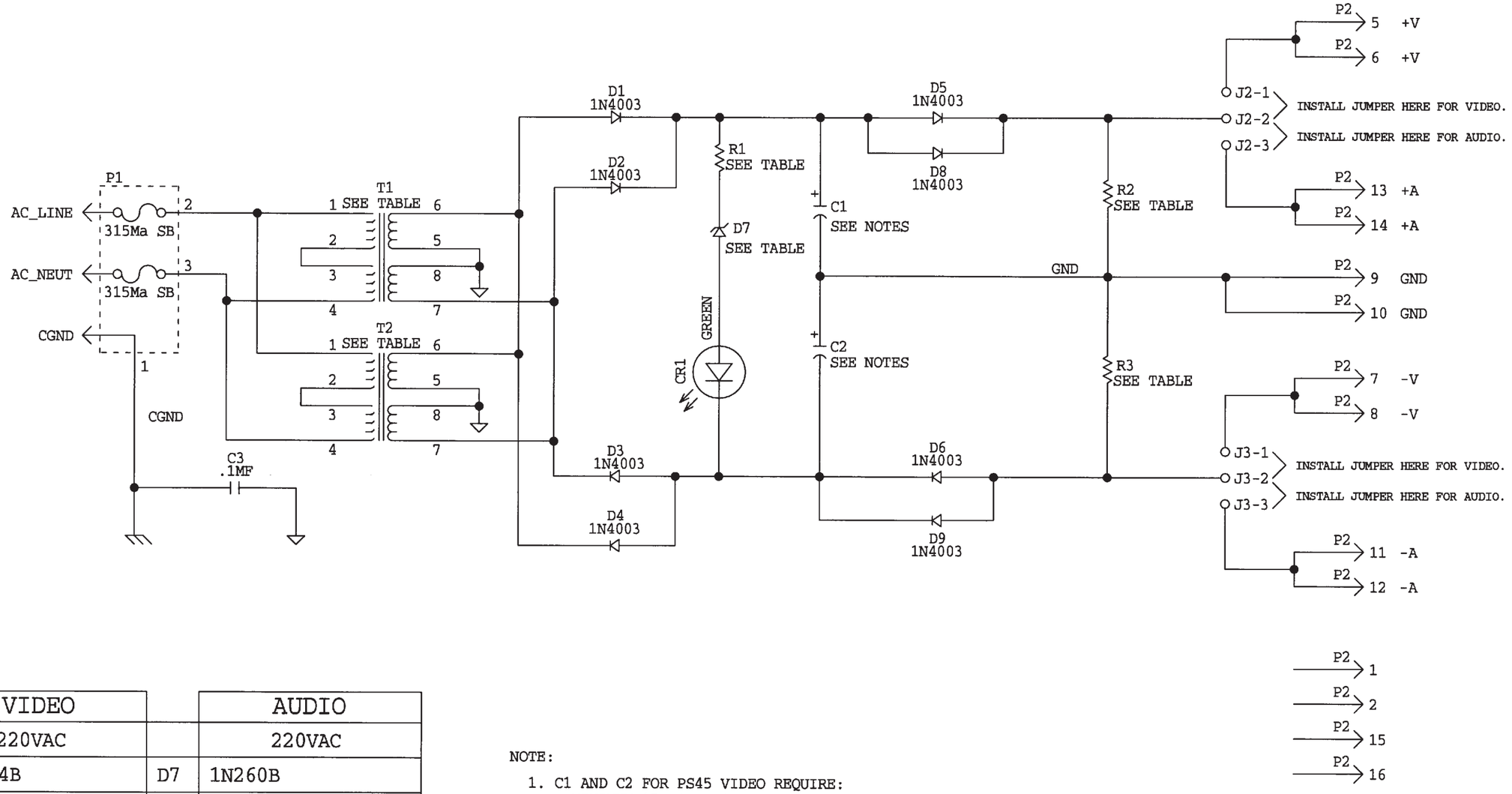








Component Assembly • Power Supply PCB (OUS) (REv 03) • CA25-1272



	VIDEO		AUDIO
	220VAC		220VAC
D7	1N5244B	D7	1N260B
R1	560 OHM 5% 1/4w	R1	1500 OHM 5% 1/4w
R2	560 OHM 5% 1/4w	R2	6800 OHM 5% 1/4w
R3	560 OHM 5% 1/4w	R3	6800 OHM 5% 1/4w
T1	48VA @ 2.4A 20V	T1	48VA 40V 1.2A
T2	48VA @ 2.4A 20V	T2	48VA 40V 1.2A

NOTE:

1. C1 AND C2 FOR PS45 VIDEO REQUIRE:
   MINIMUM 15 WORKING VOLTS
   NOMINAL 10,000uF OR GREATER
   MINIMUM 2.2 AMPS RIPPLE CURRENT
   MAXIMUM DIMENSION 25MM(D) X 35MM(L)

2. C1 AND C2 FOR PS45 AUDIO REQUIRE:
   MINIMUM 50 WORKING VOLTS
   NOMINAL 4700uF OR GREATER
   MINIMUM 2.2 AMPS RIPPLE CURRENT
   MAXIMUM DIMENSION 25MM(D) X 35MM(L)

7.1 Parts List

General

The Parts List in this section have been grouped according to each assembly associated with the DA3000 Audio Mainframe. Refer to each list by name of card, board, or section of the equipment requiring replacement parts.

Part	Part Number	Page
ADA3000 Mainframe	81906516670	7.2
DA3000 Chassis	81906516680	7.3
DA3000 Audio Backplane	81906516700	7.4
ADA3001 Audio Distribution Amplifier	81906516720	7.5
ADA3002 Audio Distribution Amplifier	81906517330	7.7
PS45A Audio Power Supply (US)	81906516760	7.9
PS45A Audio Power Supply (OUS)	81906517310	7.10

ADA3000 Audio Mainframe Assembly (REV C) - 81906516670

81902003300	FAN GUARD DA3000 MAINFRAME	1	EA
81902101468	LABEL EQUIP SERIALIZATION	1	EA
81902104720	COVER BACKPLANE PWR BLK PLAS	1	EA
81902200088	WASHER #4 FLAT	2	EA
81902202704	SCREW 4-40 X 3/8 PAN HEAD SIMM	2	EA
81902202795	SCREW 4-40 X 3/16 EXT TOOTH	8	EA
81902202950	SCREW 4-40 X 9/16 PAN HEAD PHIL	2	EA
81902900265	SCREW HEX FEMALE	4	EA
81902906072	CONN PLUG 3-PIN ORANGE	1	EA
81903463420	PANEL REAR ADA3000	2	EA
81906516680	CHASSIS ASSY DA3000	1	EA
81906516700	BACKPLANE DA3000 AUDIO	1	EA
CD63-0738	DOC DA3000 TOP BILL	REF	

DA3000 Chassis (REV D) - 81906516680

81902003227	LATCH SLIDE BLACK TAB CEI	2	EA
81902202940	RIVET 120 DEGREE CENTER-SINK	12	EA
81903463270	TRAY DA3000	1	EA
81903463280	TOP PANEL DA3000	1	EA
81903463290	VERTICAL PLATE LEFT DA3000	1	EA
81903463300	VERTICAL PLATE RIGHT DA3000	1	EA
81903463310	DOOR DA3000	1	EA
CD63-0739	DOC CHASSIS ASSY DA3000	REF	

ADA3000 Audio Backplane (REV A) - 81906516700

81902105050	LABEL BARCODE 1.5" X 0.25"		1	EA
81902412420	PCB BACKPLANE DA3000 AUDIO		1	EA
81902901594	CONN MNL 6-POSITION FEMALE	J8	1	EA
81902903160	HEADER 2-PIN MTA LOCKING	J5	1	EA
81902906353	CONN 3-POS MALE POLAR STAR	J6 J100-J108 J110-J118 J120-J126 J130-J138 J140-J148 J150-J158 J160-J168 J170-J178 J180-J188 J190-J198	91	EA
81902907200	CONN 16-POS PC MT FEMALE	J1 J2	2	EA
81902907230	CONN 32-POS FEMALE 16X2	J200-J209	10	EA
CA25-1242	DOC BACKPLANE DA3000 AUDIO		REF	
SC33-1242	DOC BACKPLANE DA3000 AUDIO		REF	

ADA3001 Audio Board (REV F) - 81906516720

81901606236	REG LM337MT NEG 0.5A TO-220	U1	1	EA
81901606244	REG LM317MT POS 0.5A TO-220	U2	1	EA
81902105050	LABEL BARCODE 1.5" X 0.25"		1	EA
81902105540	BERGQUIST 0.080 GAP PAD VO		1	EA
81902202712	SCREW 4-40 X 5/16 SIMM PAN HEAD		3	EA
81902412440	PCB DA3000 AUDIO CARD		1	EA
81902907240	CONN 32-POS MALE RT/A 16X2	P1	1	EA
81903463610	SHIELD DA3000 AUD/VID		1	EA
81903465170	AL SPACER/HEAT SPREADER		1	EA
81906600903	RESISTOR 10K 5% 0805	R63 R64	2	EA
81906600986	RESISTOR 22K 5% 0805	R20 R27 R61 R62	4	EA
81906601000	RESISTOR 27K 5% 0805	R12 R13	2	EA
81906601521	RESISTOR 0.0 OHM 5% 0805	R22 R25	2	EA
81906610280	RESISTOR 19.1 OHM 1% 0805	R19 R28	2	EA
81906610910	RESISTOR 86.6 OHM 1% 0805	R6	1	EA
81906611300	RESISTOR 221 OHM 1% 0805	R7	1	EA
81906611348	RESISTOR 243 OHM 1% 0805	R5 R31	2	EA
81906611560	RESISTOR 412 OHM 1% 0805	R41	1	EA
81906611603	RESISTOR 453 OHM 1% 0805	R23 R24	2	EA
81906611652	RESISTOR 511 OHM 1% 0805	R18 R21 R26	3	EA
81906611769	RESISTOR 665 OHM 1% 0805	R9	1	EA
81906611850	RESISTOR 825 OHM 1% 0805	R15	1	EA
81906612264	RESISTOR 2.21K 1% 0805	R10	1	EA
81906612460	RESISTOR 3.57K 1% 0805	R2 R33	2	EA
81906612601	RESISTOR 5.11K 1% 0805	R3 R14 R16 R39	4	EA
81906613104	RESISTOR 16.9K 1% 0805	R37 R42	2	EA
81906613344	RESISTOR 30.1K 1% 0805	R38 R40	2	EA
81906614840	RESISTOR 75 OHM 1% 0805	R29 R30 R65 R66	4	EA
81906640024	RESISTOR 2.0 OHM 5% 1210	R59 R60	2	EA
81906640200	RESISTOR 33.2 OHM 1% 1210	R43-R58	16	EA
81906650023	POT 5K RT/A SMT	R4 R17	2	EA
81906650210	POT 1K VERT 1-TURN 20% 4MM	R1 R32 R35	3	EA
81906650220	POT 50K VERT 1-TURN 20% 4MM	R8	1	EA
81906700059	CAP 6.8PF 50V CERAMIC 0805	C7 C8 C10	3	EA
81906700133	CAP 3.3PF 50V CERAMIC 0805	C16 C17	2	EA
81906700190	CAP 270PF 50V CERAMIC 0805	C11	1	EA
81906730015	CAP 0.1MF 50V CERAMIC 1206	C6 C9 C12 C18	4	EA
81906770029	CAP 6.8MF 35V TANT 7343	C1 C15	2	EA
81906770070	CAP 33MF 6.3V TANT SIZE “C”	C19 C20 C21 C22	4	EA
81906770100	CAP 1MF 35V TANT	C2 C3 C4 C5 C13 C14	6	EA
81906800164	DIODE BAV99 50MA SOT-23	D1 D2	2	EA
81906800490	DIODE MMBD7000 SOT-23 LOW	D3 D4	2	EA
81906800520	TRANS NPN AUDIO SOT-223	Q2 Q4	2	EA
81906800530	TRANS PNP AUDIP SOT-223	Q1 Q3	2	EA
81906800560	ZENER CLL52298 4.3V SOT-8	D5 D6	2	EA
81906810900	IC DUAL 24V AMP AUDIO	U5	1	EA
81906810910	IC 24V OP AMP AUDIO	U3	1	EA

ADA3001 Audio Board (REV F) - 81906516720 Continued:

81906920030	SWITCH DIP 4-POS GULL-WING	SWX1	1	EA
CA25-1244	DOC ASSY DA3000 AUDIO CARD		REF	
NOT-PLACED	ITEMS NOT-PLACED ON EBOM	R11 R34 R36	REF	
SC33-1244	DOC ASSY DA3000 AUDIO CARD		REF	

ADA3002 Audio Board (REV F) - 81906517330

81901606236	REG LM337MT NEG 0.5A TO-220	U1	1	EA
81901606244	REG LM317MT POS 0.5A TO-220	U2	1	EA
81902105050	LABEL BARCODE 1.5" X 0.25"		1	EA
81902105540	BERGQUIST 0.080 GAP PAD VO		1	EA
81902202712	SCREW 4-40 X 5/16 SIMM PAN HEAD		3	EA
81902412440	PCB DA3000 AUDIO CARD		1	EA
81902907240	CONN 32-POS MALE RT/A 16X2	P1	1	EA
81903463610	SHIELD DA3000 AUD/VID		1	EA
81903465170	AL SPACER/HEAT SPREADER		1	EA
81906600903	RESISTOR 10K 5% 0805	R63 R64	2	EA
81906600986	RESISTOR 22K 5% 0805	R20 R27 R61 R62	4	EA
81906601000	RESISTOR 27K 5% 0805	R12 R13	2	EA
81906601521	RESISTOR 0.0 OHM 5% 0805	R22 R25	2	EA
81906610280	RESISTOR 19.1 OHM 1% 0805	R19 R28	2	EA
81906610680	RESISTOR 49.9 OHM 1% 0805	R6	1	EA
81906611116	RESISTOR 140 OHM 1% 0805	R7	1	EA
81906611348	RESISTOR 243 OHM 1% 0805	R5 R31	2	EA
81906611560	RESISTOR 412 OHM 1% 0805	R9 R41	2	EA
81906611603	RESISTOR 453 OHM 1% 0805	R23 R24	2	EA
81906611652	RESISTOR 511 OHM 1% 0805	R18 R21 R26	3	EA
81906611850	RESISTOR 825 OHM 1% 0805	R15	1	EA
81906612015	RESISTOR 1.21K 1% 0805	R10	1	EA
81906612460	RESISTOR 3.57K 1% 0805	R2 R33	2	EA
81906612601	RESISTOR 5.11K 1% 0805	R2 R11 R14 R16 R39	5	EA
81906613104	RESISTOR 16.9K 1% 0805	R37 R42	2	EA
81906613344	RESISTOR 30.1K 1% 0805	R38 R40	2	EA
81906614840	RESISTOR 75 OHM 1% 0805	R29 R30 R65 R66	4	EA
81906640024	RESISTOR 2.0 OHM 5% 1210	R59 R60	2	EA
81906640220	RESISTOR 301 OHM 1% 1210	R43-R58	16	EA
81906650023	POT 5K RT/A SMT	R4 R17	2	EA
81906650210	POT 1K VERTICAL 1-TURN 20% 4MM	R1 R32 R35	3	EA
81906650220	POT 50K VERT 1-TURN 20% 4MM	R8	1	EA
81906700059	CAP 6.8PF 50V CERAMIC 0805	C7 C8 C10	3	EA
81906700133	CAP 3.3PF 50V CERAMIC 0805	C16 C17	2	EA
81906700190	CAP 270PF 50V CERAMIC 0805	C11	1	EA
81906730015	CAP 0.1MF 50V CERAMIC 1206	C6 C9 C12 C18	4	EA
81906770029	CAP 6.8MF 35V TANT 7343	C1 C15	2	EA
81906770070	CAP 33MF 6.3V TANT SIZE “C”	C19 C20 C21 C22	4	EA
81906770100	CAP 1MF 35V TANT	C2 C3 C4 C5 C13 C14	6	EA
81906800164	DIODE BAV99 50MA SOT-23	D1 D2	2	EA
81906800490	DIODE MMBD7000 SOT-23 LOW	D3 D4	2	EA
81906800520	TRANS NPN AUDIO SOT-223	Q2 Q4	2	EA
81906800530	TRANS PNP AUDIO SOT-223	Q1 Q3	2	EA
81906800560	ZENER CLL5229B 4.4V SOT-80	D5 D6	2	EA
81906810900	IC DUAL 24V AMP AUDIO	U5	1	EA
81906810910	IC 24V OP AMP AUDIO	U3	1	EA
81906811100	IC DUAL AUDIO LO POWER	U6	1	EA

ADA3002 Audio Board (REV F) - 81906517330 Continued:

81906920030	SWITCH DIP 4-POS GULL-WING	SWX1	1 EA
CA25-1244	DOC ASSY DA3000 AUD CARD		REF
NOT-PLACED	ITEMS NOT PLACED ON EBOM	C34 C36	REF
SC33-1244	DOC ASSY DA3000 AUD CARD		REF

Power Supply PCB (US) (REV 05) - 81906516760

81900200700	RESISTOR 1.5K 5% 1/4W	R1	1	EA
81900200866	RESISTOR 6.8K 5% 1/4W	R2 R3	2	EA
81900700055	CAP 0.1MF 50V CERAMIC RADIAL	C3	1	EA
81901000820	CAP ELECT 4700UF TO 5600UF	C1 C2	2	EA
81901500140	DIODE 1N4003 200V PIV 1A	D1 D2 D3 D4 D5 D6 D8 D9	8	EA
81901500751	DIODE 1N5260B 43V 5% 500MA	D7	1	EA
81902101468	LABEL EQUIP SERIALIZATION		1	EA
81902104231	RUBBER BUMPER 0.5 X 0.25 BLACK		1	EA
81902104538	LABEL AIA SHIELD		1	EA
81902105090	INSULATOR PS45 TRAY		1	EA
81902105100	INSULATOR PS45 TRANSFORMER		1	EA
81902200112	SCREW 4-40 X 3/16 PAN HEAD PHIL		4	EA
81902202970	STANDOFF 4-40 X 1.25 M/F HEX		4	EA
81902301270	TRANSFORMER 48VA 40V CT	T1 T2	2	EA
81902412450	PCB ASSY PS45 POWER SUPPLY		1	EA
81902700920	FUSE 5X20 630MA TIME-LAG	F1 F2	2	EA
81902804030	CORD POWER 3-COND 18AWG 7’6"		1	EA
81902907190	CONN AC W/FUSE PC MT 10A	P1	1	EA
81902907210	CONN 16-PIN HEADER RT/A MA	P2	1	EA
81902907590	FUSE DRAWER 2-POLE PC MOUNT		1	EA
81903200541	LED GREEN RT/A HI-EFF PCB	CR1	1	EA
81903463330	SUPPORT PLATE PS45 POWER SUP		1	EA
81903463720	COVER PS45 POWER SUPPLY		1	EA
CA25-1245	DOC ASSY PS45 VIDEO		REF	
DD52-1245	DOC ASSY PS45 VIDEO		REF	
SC33-1245	DOC ASSY PS45 VIDEO		REF	

Power Supply PCB (OUS) (REV 04) - 81906517310

81900200700	RESISTOR 1.5K 5% 1/4W	R1	1	EA
81900200866	RESISTOR 6.8K 5% 1/4W	R2 R3	2	EA
81900700055	CAP 0.1MF 50V CERAMIC RADIAL	C3	1	EA
81901000820	CAP ELECT 4700UF TO 5600UF	C1 C2	2	EA
81901500140	DIODE 1N4003 200V PIV 1A	D1 D2 D3 D4 D5 D6 D8 D9	8	EA
81901500751	DIODE 1N5260B 43V 5% 500MA	D7	1	EA
81902101468	LABEL EQUIP SERAILIZATION		1	EA
81902104231	RUBBER BUMPER 0.5 X 0.25 BLACK		1	EA
81902104538	LABEL AIA SHIELD		1	EA
81902105090	INSULATOR PS45 TRAY		1	EA
81902105100	INSULATOR PS45 TRANSFORMER		1	EA
81902200112	SCREW 4-40 X 3/16 PAN HEAD PHIL		4	EA
81902202970	STANDOFF 4-40 X 1.25 M/F HEX		4	EA
81902301270	TRANSFORMER 48VA 40V CT	T1 T2	2	EA
81902412720	PCB PS45 POWER SUPPLY		1	EA
81902700930	FUSE 5X20 315MA TIME-LAG	F1 F2	2	EA
81902804030	CORD POWER 3-COND 18AWG 7’6"		1	EA
81902907190	CONN AC W/FUSE PC MT 10A	P1	1	EA
81902907210	CONN 16-PIN HEADER RT/A MA	P2	1	EA
81902907590	FUSE DRAWER 2-POLE PC MOUNT		1	EA
81903200541	LED GREEN RT/A HI-EFF PCB	CR1	1	EA
81903463330	SUPPORT PLATE PS45 POWER		1	EA
81903463720	COVER PS45 POWER SUPPLY		1	EA
CA25-1272	DOC PCB PS45 POWER SUPPLY		REF	
DD52-1272	DOC PCB PS45 POWER SUPPLY		REF	
SC33-1272	DOC PCB PS45 POWER SUPPLY		REF	