Audio Note

Dac 3.1x Balanced

Digital to Analogue Converter

Owners Manual

AUDIO NOTE DAC 3.1x Balanced

Introduction

We at Audio Note wish to congratulate you on your purchase of the Audio Note Dac 3.1x Balanced digital to analogue converter. You have made a musically lasting choice, one which we hope you will derive years of satisfaction and pleasure.

You can be assured that any future digital product developments will be designed so that they can be retrofitted on all Audio Note Dac 3.1x and Dac 2.1x Balanced digital to analogue converters. You can be confident that your Dac 3.1x will not be obsolete with the next major technological change or improvement.

Technical Overview

The digital output data from the CD transport is connected to either the 75 Ohm BNC input or 110 Ohm AES/EBU (XLR) input. Transformer coupling is used on both inputs to minimize noise coupling into the input circuitry. A relay controlled by the rear panel selector switch applies the selected data signal and isolates the unselected input. The data signal is now fed to the Crystal CS8414 input receiver. The output data from the input receiver is then fed to a 74HC86, which provides the phase inversion function. The data stream is then sent to a two input NOR gate (74HC02) which sends data to the left and right DACs within the AD1865N and update data to the latch left (pin 14) and latch right (pin 11). The "current mode" outputs of the AD1865N are used (pins 4 and 21) which enables the use of a resistor and interface transformer to perform the current to voltage conversion for each channel. The voltage developed across the interface transformer secondary is then fed to the analogue filter and then to the analogue output PCB, where it is amplified using one 6922/ECC88 for each channel, configured as a parallel connected common cathode amplifier. High resolution, high quality output transformers load the 6DJ8/6922 tubes, providing a low impedance balanced or unbalanced output from each transformer secondary.

The Power supply utilises a single power transformer and the secondary AC voltages are rectified and filtered on the power supply PCB. The high voltage supply is rectified by a 6X5WGT tube rectifier and filtered by a dual 20H choke and 100uF filter capacitors. The tube filaments are fully regulated using LM317T IC regulators. The digital power supply utilizes schottky rectifiers and Rubycon "Black Gate" capacitors.

The regulators on the digital PCB are shunt regulators using a combination of IC and discrete devices and provide superb electrical and sonic performance. These regulators take advantage of the Black Gate capacitors superior sonics and reliability.

THE DAC 3.1x CONTAINS VOLTAGES THAT ARE POTENTIALLY HARMFUL!
DO NOT EXPOSE TO RAIN OR MOISTURE!

General Information

The Audio Note Dac 3.1x Balanced (herein known as Dac 3.1x) is a stand alone digital to analogue converter intended for use with a compact disk transport or CD player with a compatible digital output.

The Dac 3.1x should be situated in a location that will provide adequate ventilation to the unit's top cover. An audio rack or shelf is ideal and preferred. At least 50mm (2.0") should be left above the top cover for good ventilation.

While unpacking you Dac 3.1x thoroughly inspect the unit for damage and report any damage whatsoever to your dealer immediately. Save all packing materials in case you need to ship or transport your Dac 3.1x.

Preparation

Once the Dac 3.1x is unpacked and inspected, remove the four Philips No.1 machine screws and washers holding the top cover to the chassis. Remove the cover and set it aside. Remove the valves (vacuum tubes) from the accessory box and remove the valves from their boxes. Each valve will be coded with its location on the valves themselves and within the unit (V1, V2 etc) on the circuit boards.

N.B. Check to ensure that the unit is ***NOT*** plugged in to the AC wall outlet.

See figure 1 on the next page for the tube locations within the Dac 3.1x.
Insert each tube carefully, insuring the tube pins are aligned with its respective socket.

The small signal valves supplied with your Dac 3.1x have been matched at the factory for channel balance of 0.3dB or better so casual replacement is not recommended. Replacement with tubes that are not factory matched will degrade performance. If test equipment is available for tube matching, then other brands of 6DJ8 may be used.

Once the valves have been inserted, replace the top cover onto the unit and using the supplied screwdriver and hardware, fasten the top cover and place the unit in its intended location. It is recommended to use the small black washers with the top cover fasteners, as they will minimize marring of the top cover finish.

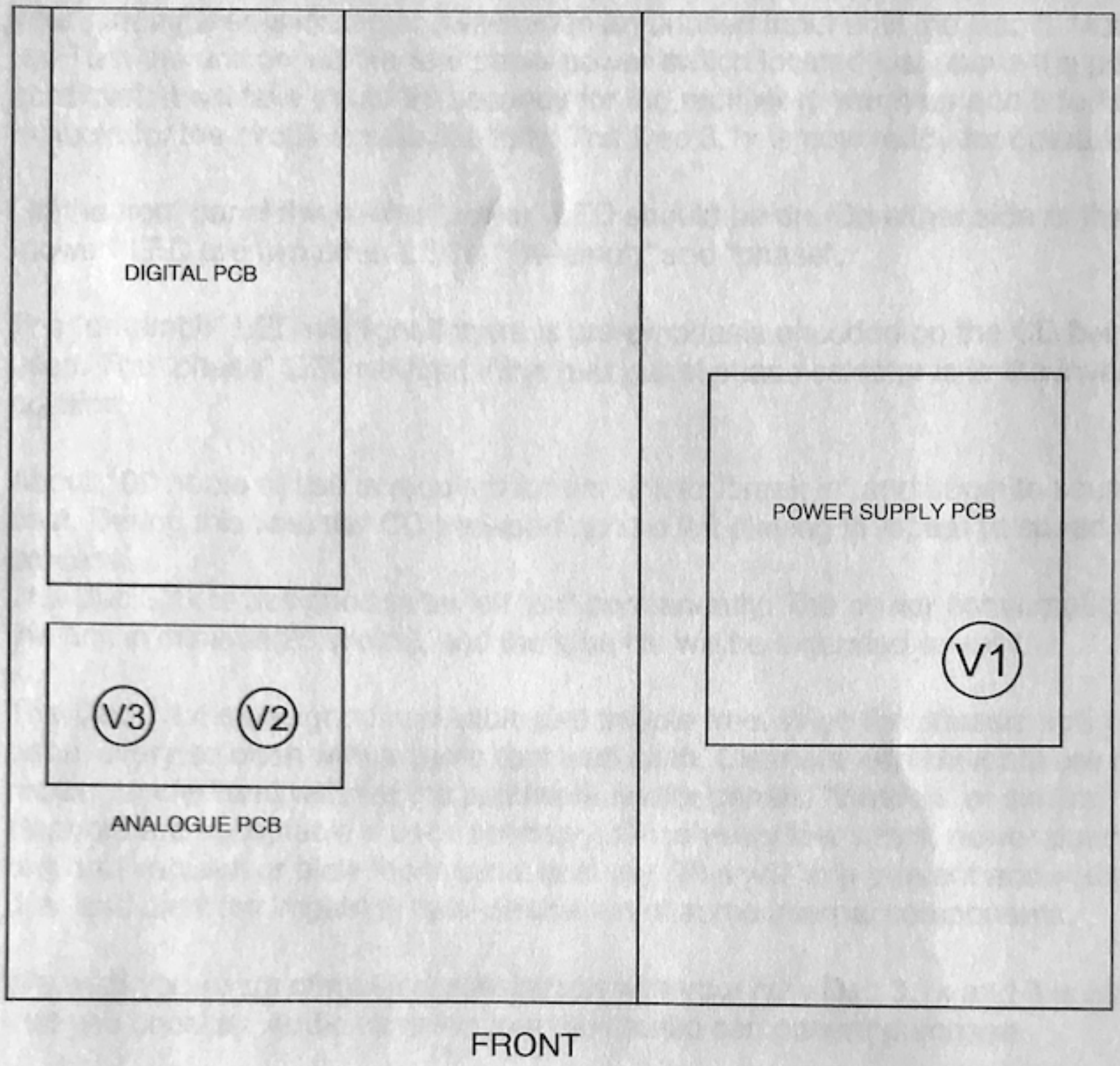

Fig.1 – Valve (tube) locations for Dac 2.1x and Dac 3.1x Balanced

We recommend making all signal connections before connecting power to the unit. The cable from your digital transport or CD player is connected to either the 75 Ohm RCA jack or the three pin 110 Ohm AES/EBU input. Use the digital input selector switch to select the appropriate input.

Connect the Dac 3.1x to your preamplifier with your choice of interconnect, either Balanced or unbalanced.
Check to make sure all connections are correct and sound. Dirty, oxidized and ill fitting connections will seriously degrade sound quality.

Operation

Connect the Dac 3.1x to your wall outlet with the supplied power cord. Make sure your preamplifier is muted or switched to an unused input until the Dac 3.1x warms up. Turn the unit on via the rear panel power switch located just above the power cord inlet. It will take about 30 seconds for the rectifier to warm up and 5 to 15 minutes for the circuit to stabilize fully. The Dac 3.1x is now ready for operation.

On the front panel the center "power" LED should be on. On either side of the "power" LED are two other LEDs, "De-emph" and "phase".

The "de-emph" LED will light if there is pre-emphasis encoded on the CD being used. The "phase" LED will light if the rear panel phase selector is in the invert position.

About 100 hours of use is required for the unit to "break in" and begin to sound its best. During this time the CD transport can be left playing in repeat to speed this process.
The Dac 3.1x is designed to be left "on" permanently. The power consumption of the unit is minimal(25 Watts), and the tube life will be extended as well.

The Dac 3.1x is designed to reliable and trouble free. Wipe the chassis and front panel every so often with a damp (not wet) cloth. Cleaners with solvents are not recommended and will mar the paintwork and/or panels. "Windex" or similar cleaners are acceptable if used sparingly. Once every few years, power down the unit and vacuum or blow the internal dust out. This will help prevent accumulated dust and dirt from impairing heat dissipation of some internal components.

We wish you years of musical satisfaction with your new Dac 3.1x and it is our hope that you consider Audio Note for your next audio component purchase.

Best Wishes,
The Audio Note Team

Specifications - Audio Note Dac 3.1x Balanced

General: 18 Bit Digital to Analogue Converter, with Vacuum tube output stage and vacuum tube rectified power supply.

Inputs: 75 Ohm RCA unbalanced and 110 Ohm AES/EBU balanced, selected via rear panel input selector switch.

Phase: Normally non- inverting. Output polarity may be reversed via rear panel selector switch

Outputs: Unbalanced left and right RCA jacks and balanced left and right XLR Jacks.

Output Voltage: Shipped configured for a nominal 3.0V RMS per channel, unbalanced, 6.0VRMS balanced.

Output Impedance: Approximately 600 Ohms @ 1kHz balanced and 150 Ohms unbalanced, minimum recommended load 10k/1000pF Ohms or greater.

Vacuum Tubes: 2 type 6DJ8/6922/7308 dual triodes and 1 type 6X5GT/6X5WGT full wave rectifier.

Power Requirements: 27 VA Maximum
110-120VAC/60Hz or 220-240VAC/50Hz,
Input voltage set by internal jumpers on the AC power inlet PCB

Fuse: Single 5 x 20mm AC input fuse
110-120VAC - Bussman type GMA-2A (fast blow)
220-240VAC - Bussman type GMA-1A (fast blow)

N. B. - Spare fuse is located in the IEC inlet socket fuse drawer on the rear panel.

Dimensions: 15.75" (40cm) D x 171/2" (44.5cm) W x 5.5" (14cm) H

Shipping Weight: 14kg (31 lbs.)

Shipping Carton Dimensions:
23" (58.5cm) W x 20 1/2" (52cm) D x 13 1/2" (34cm) H