CLASSÉ AUDIO

DAC-1

DIGITAL/ANALOG PROCESSOR

DAC-1

OWNER'S MANUAL

CLASSÉ DESIGN PHILOSOPHY

1. REPEATED LISTENING DESIGN SESSIONS:

Fine tuning of sound by exchanging and mixing of parts (transistors, capacitors, wiring, PCB boards etc.), and adjusting many specific operating voltages within proper engineering ranges, producing an overall sonic recipe giving the most natural harmonic realism of music typical of instruments in a live performance.

2. UPGRADABLE SINGLE CIRCUIT DESIGNS:

All Classé products share exactly the same circuit design philosophy. This means all amplifiers and all high level circuits benefit from the same design goals. Similar circuits are then tailored to different power levels etc. Differences between less expensive models and more expensive models are parts quality and compliment, power supply extravagance and the amount of filtering etc., as well as features and packaging.

This means that for years Classé has been constantly sonically fine tuning and technically upgrading this circuit design and its application, thus reaching a very high level of natural musical enjoyment, as well as excellent reliability which benefits all models.

3. EXTREME LONG LIFE IN REAL WORLD CONDITIONS:

Choosing the best attainable quality parts and materials combined with the advantages of the two above-mentioned areas provides Classé owners with years of proven trouble free reliability and musical enjoyment.

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UNPACKING & SET-UP

The Classé DAC-1 has been carefully wrapped in heavy gauge plastic, packed in semi-rigid foam and contained in a special box. To remove the unit, open and spread the top flaps of the box. By its sides, lift out the entire unit with the foam pieces intact. Remove each foam side by pulling straight out. Remove the plastic wrap and inspect the unit for any concealed damage. Apart from this owner's manual, please ensure the detachable A.C. linecord has also been included.

Please report any damage or missing parts to your dealer promptly.

The DAC-1 must be located in a position free of any hum-inducing magnetic fields. (This also applies to turntables and interconnect cables.) Positions adjacent to power amplifiers, A.C. line filters, or regulation devices should be avoided. Ideally, a few feet should separate the DAC-1 from the power amplifier. As well, keep low-level interconnect cables away from the power amp and separate from A.C. line cords.

Heat generated by the processor is negligible. Air space around the unit need not be a concern.

Check the Serial Number sticker on the back of the unit for the correct operating voltage. Regardless of voltage, the fuse rating should be 3/4 AMP SLO-BLO.

A.C. LINE POWER

The DAC-1 has no ON/OFF switch. Its low power consumption and improved sonics from always being ON led to the use of a STANDBY switch only. While thoroughly musical shortly after turn-on, the DAC-1 will exhibit "sonic growth" for the first 300 hours of use.

For optimum sonic performance, you should consider use of the optional CLASSE REFERENCE A.C. LINECORD. Consult your dealer regarding this accessory.

CAUTION: "FLOATING THE GROUND" OR DEFEATING THE GROUND ON A 3-PRONG LINECORD MAY CREATE A SHOCK HAZARD. CONNECT ALL INTERCONNECT CABLES BETWEEN THE ELECTRONICS BEFORE CONNECTING THE A.C. LINECORDS TO THE WALL OUTLETS. THIS WILL REDUCE THE POTENTIAL SHOCK HAZARD. SEE ALSO THE WARRANTY SECTION OF THIS OWNER'S MANUAL.

FRONT PANEL AND CONTROLS:

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1. STANDBY:

When the processor is in standby mode, the source oscillator stops working, this prevents any possible digital noise or interference from being generated. The analog section as well as the DACs remains powered to maintain thermal stability of the unit.

2. PHASE:

Selects between inverted (180 degrees phase shift) or normal non-inverted mode (0 degree phase shift). The audio phase inversion is performed digitally before the data reaches the DACs and indicated on the display.

3. DISPLAY:

Three (3) different display brightness levels (low/medium/high and off) can be set to suit room illumination.

4. INPUT SELECTOR:

Selects one of five digital inputs: COAXIAL-1, COAXIAL-2, BALANCED, TOSLINK, and ST. The input selector passes only DC levels that are used to control high grade relays that do the actual switching.

DISPLAY INFORMATION:

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5. INPUT SELECTOR INDICATORS:

One of the following indicators will be on to indicate the selected digital input.

COAXIAL 1

COAXIAL 2

BALANCED

TOSLINK

ST

6. HDCD indicator:

The HDCD indicator will automatically come on if HDCD encoded data is detected and off for a normally encoded CD. The analog gain is automatically increased by 6dB for an HDCD disc.

7. LOCK/32/44/48 indicators:

Indicates the input frequency (32 kHz, 44.1 kHz and 48 kHz) and the locked status.

8. PHASE indicator:

This Indicator will be on when the phase invert mode is selected.

9. DEEMP indicator:

This indicator will automatically come on when a disc encoded with preemphasis is detected.

10. STANDBY indicator:

This indicator will be on when the processor is in the standby mode.

NOTE: All other indicators will be off when the unit is in standby mode.

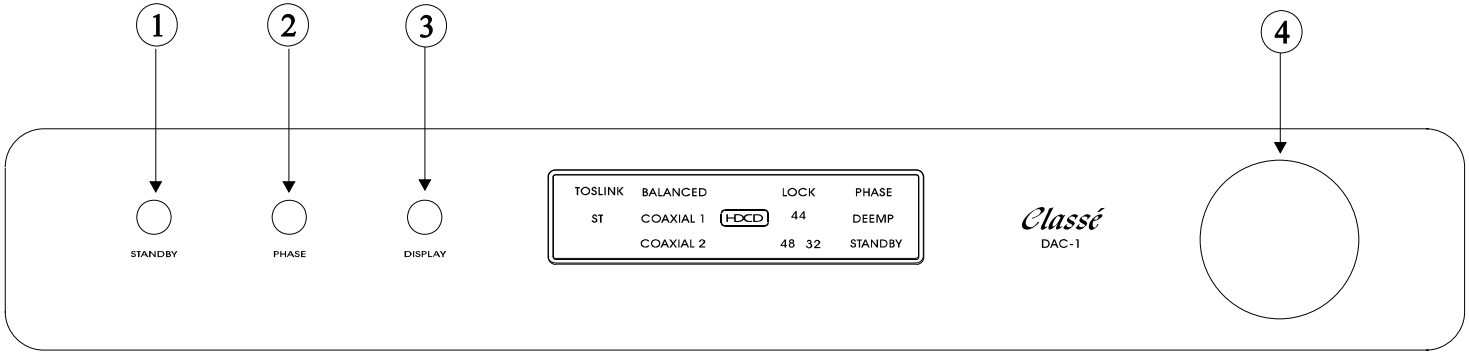

Fig.1: DAC-1 Front panel control

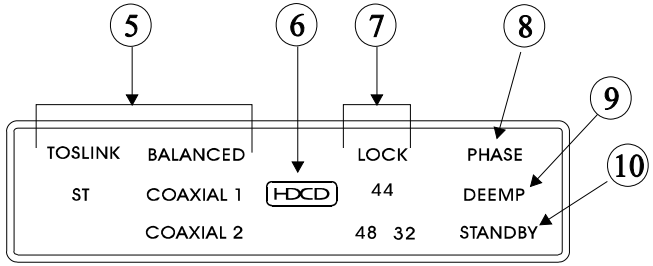

Fig.2: DAC-1 Display information

REAR PANEL CONNECTIONS AND FUNCTIONS:

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1. ST OPTICAL DATA INPUT CONNECTOR:

Digital input for optical ST standard

2. "TOSLINK" OPTICAL INPUT CONNECTOR:

Digital input for optical "Toslink" system

3. BALANCED (XLR-AES) DATA INPUT CONNECTOR:

Digital input for the electrical AES standard

4. COAXIAL-1 DATA INPUT CONNECTOR:

Digital input for electrical SPDIF standard

5. COAXIAL-2 DATA INPUT CONNECTOR:

Digital input for electrical SPDIF standard

6. AC INLET CONNECTOR

7. RIGHT CHANNEL BALANCED XLR ANALOG OUTPUT

8. RIGHT CHANNEL SINGLE ENDED ANALOG OUTPUT

9. LEFT CHANNEL BALANCED XLR ANALOG OUTPUT

10. LEFT CHANNEL SINGLE ENDED ANALOG OUTPUT

CONNECTING CABLES:

The overall performance of Digital/Analog processors will vary dramatically with the quality and type of cables chosen. Selection of the highest quality digital input cables combined with output interconnects is recommended for maximum performance of the Classé DAC-1

CAUTION: Install all input and output cables before connecting the power AC cord.

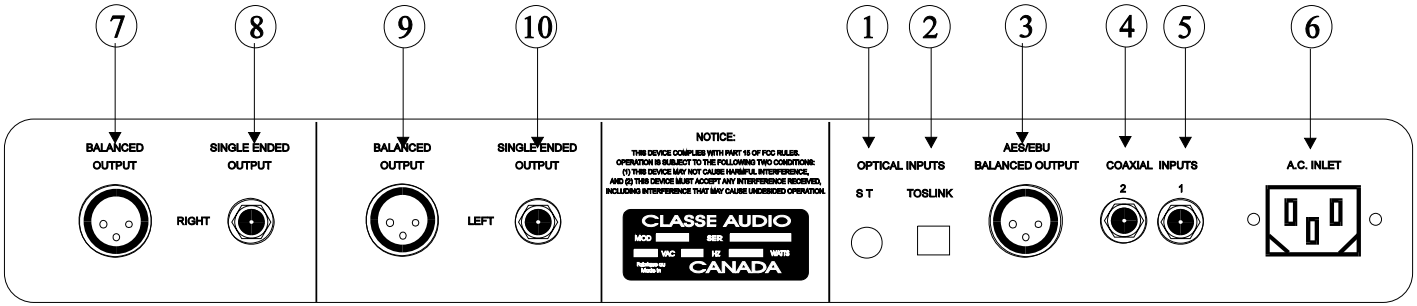

Fig.3: DAC-1 Rear viewl

TECHNICAL DESCRIPTION

The DAC-1 is a digital-to-analog processor that will accept digital audio data from up to five different digital sources. It provides balanced and single ended stereo analog outputs capable of driving the inputs of a preamp or home theatre processor. All internal power is provided by four fully linear regulated power supplies. The DAC-1 features an HDCD decoder that, in addition to allowing full HDCD decoding, functions as a state of the art 8x oversampling filter if the input data is not encoded in HDCD format. The DAC-1 employs an ultra low jitter AES21 AES/SPDIF receiver from UltraAnalog, Inc and dual 20-bit digital-to-analog converters (DAC's) implemented in a fully balanced configuration. Front panel switches allow control over display brightness (off, low, medium, high), phase inversion, input selection, and standby. The DAC-1 is designed to comply with UL safety and FCC interference regulations for consumer audio equipment.

The power supply is a fully linear regulated design using an ultra high current 88 VA rated toroidal transformer. Separate supplies are used for the digital and analog circuits providing optimum isolation. There is over 200% power margin in the analog transformer which combined with over 32,000uF of capacitance in the power supply assures that there is plenty of reserve power to handle any transient signal. The use of our highest quality polypropylene film bypass capacitors distributed throughout the circuit ensures that the peak currents are localized to the most demanding circuits. The analog left and right channels have their own linear regulator circuits, and an additional two more linear regulators provide power for the digital processing circuits as well as the front panel control and display.

The large high grade rotary switch on the front panel selects one of five digital inputs to be used. The rotary switch passes only DC levels that are used to control special relays that do the actual signal switching. There is one Toslink optical input, two coax (SPDIF) inputs, one XLR (AES) input, and one fiber optic glass ST input. The coax inputs accept nominal 0.5Vpp input levels and are terminated in

75ohms. The AES input accepts input levels anywhere from 2Vpp to 10Vpp and is terminated in 110 Ohms. The digital inputs are switched with special designed high reliability, low capacitance relays. The low capacitance together with a careful printed circuit layout provides for negligible interference between one digital source and another. The SPDIF and AES inputs are coupled with a custom, low capacitance, wide bandwidth, and shielded pulse transformer which results in maintaining the pure wave shapes for minimal jitter.

The input source selected is passed to the input of the UltraAnalog, Inc. AES21 digital receiver. The AES21 provides clock recovery of below 40 picoseconds (40x10-12 seconds) rms. In addition, the AES receiver rejects jitter in the audio bandwidth above 1 kHz thereby removing artifacts of the SPDIF and AES digital transmission. This ultra low jitter clock is used as the master clock for the HDCD decoder and DAC's. The AES21 will lock to input frequencies at 32 kHz, 44 kHz, and 48 kHz. The front panel display indicates the frequency and locked status.

The output of the AES21 receiver is oversampled by the HDCD decoder to a rate that is 8 times higher than the original sampling frequency. Oversampling the digital data to such a high rate allows the analog filter following the DAC's to have far fewer poles than would otherwise be required. This allows a simpler analog filter to follow the DAC which reduces the errors that are associated with "brick wall" analog filters and also minimizes the number of components in the signal path. With non-HDCD encoded data, the decoder exhibits performance to common digital filter IC's. The stop band attenuation is greater than -120dB and the internal calculations are carried out with 27-bit accuracy. If the data is encoded in HDCD format, the filter will detect it and decode it, extracting all of the additional information available with an HDCD recording. The HDCD indicator on the front panel will come on if HDCD encoded data is detected. The indicator will be off for a normal encoded CD. The analog gain is increased by 6dB automatically when an HDCD disc is detected as suggested by Pacific Microsonics, Inc. The HDCD filter also performs deemphasis filtering for discs encoded with preemphasis.

The audio phase inversion is performed digitally before the data reaches the DAC. The phase is inverted 180 degrees when the front panel indicator is on.

UltraAnalog, Inc 20-bit dual DACs per channel are configured for true balanced operation. The outputs of the converters are each followed by passive 3-pole, linear phase, anti-imaging filters to remove any artifacts beyond the audio frequency range from the analog audio signal. Tight tolerance, low temperature coefficient, polypropylene capacitors and 1% metal film resistors are used in the filter for long term accuracy and stability. The last stage of the filter is a passive 6dB attenuator to provide the proper HDCD levels. The gain selection is performed with high reliability relays for transparent switching.

The latest Classé ultra fast high current analog circuitry has been specially implemented in the DAC-1. The four discrete amplifier circuits feature input stages using differential J-FET pairs cascaded, isolating the front end and allowing optimum operation of the devices.
The second stage is an active current source which regulates a series differential cascaded gain stage and is coupled to the power MOSFET output devices.

The output drivers are followed by relays to protect outside equipment from power-on transients as well as to protect the DAC-1 from other equipment when the DAC-1 is not powered.
Great care has been used throughout the design and layout of the DAC-1 to meet FCC class B requirements. This will ensure that the DAC-1 will be insensitive to noisy components in a system and in turn will not cause harmful interference.
Every DAC-1 undergoes rigorous computerized testing that measures each critical performance parameter. Every unit has to pass more than 100 separate tests before leaving the factory.

CLASSÉ DAC-1
DIGITAL/ANALOG PROCESSOR

SPECIFICATIONS

DIGITAL SPECIFICATIONS:

Inputs:	5 Digital inputs (2) COAXIAL (1) BALANCED AES/EBU (1) TOSLINK optical (1) ST optical
Controls:	Digital input, phase select, display brightness, and standby.
Sample rate:	32 kHz, 44.1 kHz, and 48 kHz.
D/A Conversion:	UltraAnalog 20-bit DACs in balanced configuration.
Digital filter:	8x oversampling, HDCD decoder and filter
Analog filter:	Passive linear phase.
Frequency response:	20 to 20 kHz $\pm$0.3dB

ANALOG SPECIFICATION:

Output:	Single ended (RCA) and Balanced (XLR)	
Output impedance:	50 Ohms	
Frequency response:	20 to 20 kHz $\pm$0.1dB	
Harmonic distortion:	Less than 0.003% @ 1 kHz	
Output levels:	Normal CD	HDCD
Single ended (RCA):	1.52 Vrms	3.04 Vrms
Balanced (XLR):	3.04 Vrms	6.08 Vrms
Signal to Noise Ratio:	110dB	
Channel separation:	123dB @ 1 kHz	

POWER REQUIREMENTS:

Voltage:	Factory set 100, 120, 220, 240 VAC
Power Consumption:	25 Watts

WEIGHT AND DIMENSIONS:

Dimensions:	Gross:	22" x 19 1/2" x 12"
	Net:	19" x 14 3/4" x 3 1/4"
Weight:	Gross:	22 lbs
	Net:	17 lbs

CLASSÉ DAC-1 LIMITED FACTORY WARRANTY (North America only).

IMPORTANT: Warranty registration and a copy of the "Authorized Dealer Bill of Sale" must be received at the Classé Audio factory (address page 17) within thirty (30) days of purchase by the original retail purchaser in order to validate this warranty.

FIVE YEAR WARRANTY (all parties)

Classé Audio, Inc. warrants this product to be free from defects in materials and workmanship to the original retail purchaser for a period of FIVE YEARS from date of manufacture, provided that any claim in virtue of this warranty be made in writing within such period.

This warranty may not be transferred to any subsequent owner unless the following conditions have been met: the product will be re-sold through an authorized Classé Audio dealer, who will be responsible for contacting Classé with all specifics (name of new owner, address of new owner, serial number of the product) of the subsequent sale. If the subsequent owner has purchased the product through an authorized Classé Audio dealer, and all of the above conditions have been met, the new owner will have the benefit of any remaining coverage from the original five year period.

In order to initiate service of any kind, it is necessary to OBTAIN PRIOR FACTORY AUTHORIZATION, AND SHIP THE UNIT PREPAID TO THE CLASSÉ FACTORY. Units coming from the USA should be shipped directly to our CUSTOMS BROKER: STARBER FRITZ INTERNATIONAL, C/O CLASSÉ AUDIO, HIGHWAY 114 EAST, NORTON, VERMONT 05907 USA.

The warranty shall be void and of no effect in the event of any of the following:

1) Operation not in accordance with this manual.
2) Accident, abuse, tampering, or unauthorized modification, as determined by Classé Audio Inc.
3) Removal, defacing, or falsifying the serial number plate.
4) Shipping without the complete factory packaging.
5) Transfer or sale of this processor by the original owner;
6) Non-compliance with any of the other conditions hereof.

CLASSÉ AUDIO INC. SHALL NOT BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING FROM OR RELATING TO THE SET-UP, OPERATION, FAILURE, TROUBLESHOOTING, OR REPAIR OF THE DAC-1 AND/OR ANY OTHER EQUIPMENT USED THEREWITH.

THIS WARRANTY, ALL CLAIMS MADE IN VIRTUE HEREOF, AND ALL ISSUES RELATING TO ANY SUCH CLAIM SHALL BE GOVERNED BY THE LAWS OF THE PROVINCE OF QUÉBEC.

WARRANTY REGISTRATION

You must fill out and return the form below, along with a copy of the authorized dealer bill of sale, to the factory within thirty (30) days of purchase. This will allow us to provide expedient service, information regarding updates and new products, and validate the Classé warranty.

DAC-1 SERIAL NUMBER_____PURCHASE DATE_____

AUTHORIZED DEALER_____

PURCHASER'S NAME_____

STREET ADDRESS_____

CITY_____STATE/PROV._____

COUNTRY_____ZIP/POSTAL CODE_____

I BECAME AWARE OF THIS PRODUCT BY:_____

(DEALER, MAGAZINE, FRIEND, ETC.)

SEND TO: CLASSÉ AUDIO INC.

Product Registration

5070 François Cusson

Lachine, Quebec, Canada

H8T 1B3

Notice to all Classé Product owners:

Thank you for your purchase of a Classé Audio component.

All of us at Classé have taken extreme care to ensure that your purchase will become a prized investment. We are proud to inform you that all Classé Audio components have been officially approved for the European Community CE mark.
This means that your Classé product has been subjected to the most rigorous manufacturing and safety tests in the world, and have proven to meet or exceed all European Community CE requirements for unit to unit consistency and consumer safety.

All of us at Classé Audio wish you many years of musical enjoyment.

As of July 18, 1996, Classé Audio has been granted Certificate No: C401CLA1.MGS, which indicates CE approval for all models of the Classé Audio product line.