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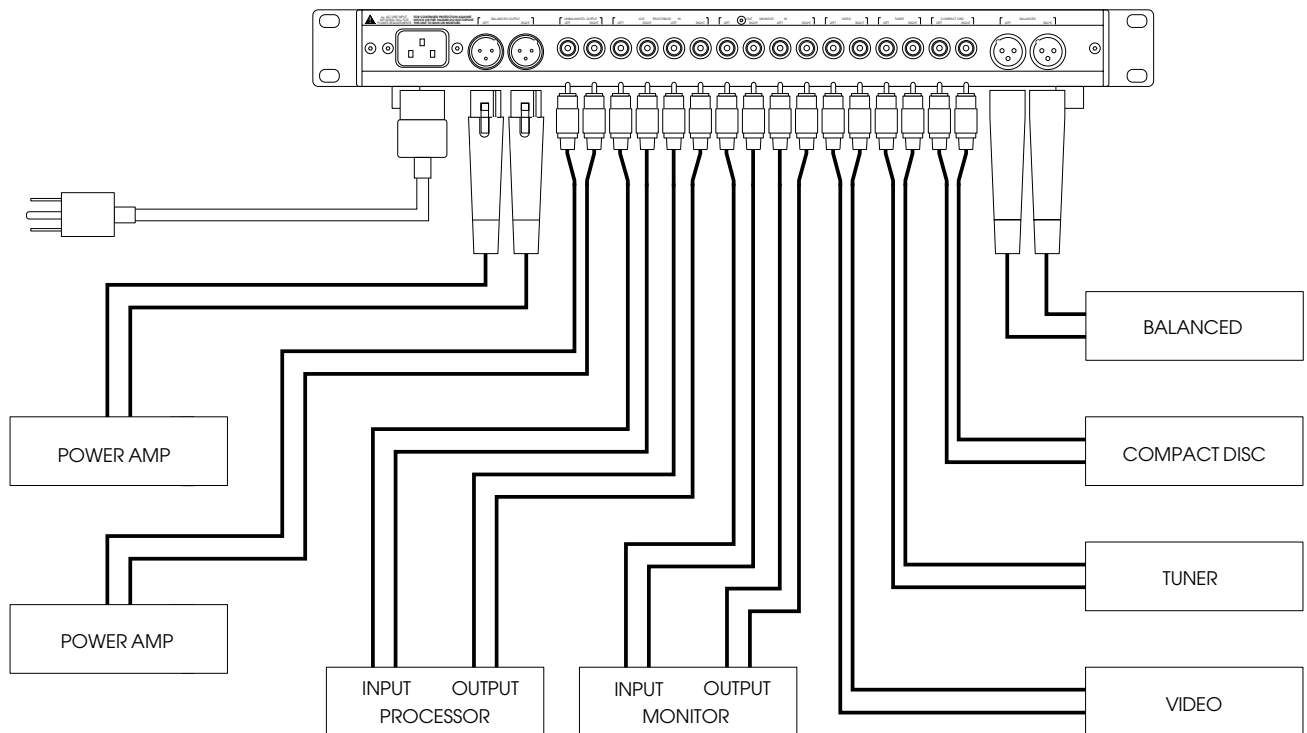
CAUTION		
	WARNING	
CAUTION: TO PREVENT ELECTRIC SHOCK, DO NOT REMOVE COVER. NO USER SERVICEABLE PARTS INSIDE, REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.		
	THIS SYMBOL IS TO ALERT YOU OF THE PRESENCE OF UNINSULATED DANGEROUS VOLTAGE WITHIN THE UNIT'S ENCLOSURE THAT MAY BE OF SUFFICIENT MAGNITUDE TO CONSTITUTE A RISK OF ELECTRIC SHOCK.	
	THIS SYMBOL IS INTENDED TO ALERT YOU OF THE PRESENCE OF IMPORTANT OPERATING AND MAINTENANCE INSTRUCTIONS IN THE LITERATURE ACCOMPANYING THE UNIT.	

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE. TO AVOID ELECTRICAL SHOCK, DO NOT OPEN THE UNIT. REFER SERVICING TO QUALIFIED PERSONNEL.

- CAUTION** - Never install or remove the power cord from the chassis unless it has been disconnected from the AC power source first.
- Never pull on the power cord when removing it from an AC power source. Grasp it by the plug.
 - Do not leave the power cord connected to an AC power source unless it is connected to the unit.
 - It is recommend that during extended periods of nonuse that the units power cord be unplugged from its AC power source.
 - Route the AC power cord so that it will not be damaged or walked on.

This preamplifier is a precision device, designed in an effort to provide the listener with unmatched sound quality, design, and construction. In order to operate your preamplifier properly and to realize all of the capabilities of the 04r LINE CONTROL BUFFER, we recommend that you read this entire manual carefully.

The first section of the installation instructions for the 04r LINE CONTROL BUFFER is a diagram of the basic configuration required to bring the preamplifier into an operating mode. These brief steps will allow you to begin operating your system. Make sure during installation that the AC power connections are interrupted to the preamplifier and all other components are off. While the diagram may be self explanatory, we strongly recommend that you read the detailed instructions following this introductory section.



I. Set up and Installation

WARNING: NEVER OPERATE THIS UNIT WITH THE TOP COVER REMOVED. NEVER MAKE ANY INTERNAL ADJUSTMENTS WHILE THIS UNIT IS CONNECTED TO AN AC POWER SOURCE.

1. Position the 04r LINE CONTROL BUFFER in the space which you have chosen, leaving enough space to connect the ancillary components of your audio system, and the AC power cord for the preamplifier. Although the 04r LINE CONTROL BUFFER has the ability to reject external fields that produce system noise, it is recommended that the unit not be placed near any sources of strong electromagnetic energy.
2. Before installing the preamplifier make sure all of the power switches of any associated components are switched off. If any of your other audio components do not have power switches, make sure they are unplugged from their AC power source.



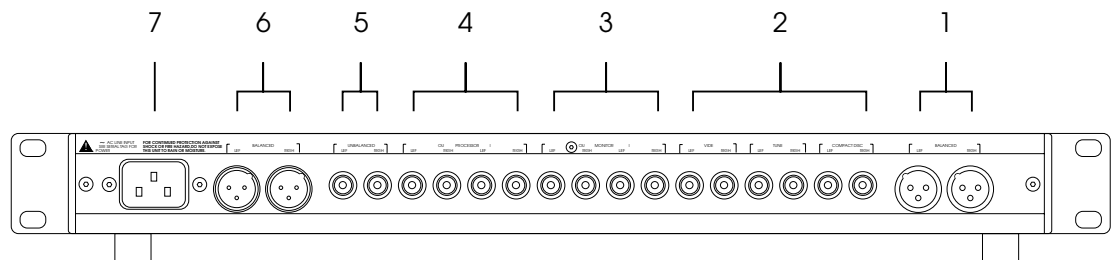
Note: The Operating Voltage of the 04r LINE CONTROL BUFFER is convertible in order that it may be used worldwide. Contact your dealer to arrange altering the operating voltage.

II. Source-Output, and Power Connections

The input and output connectors are clearly marked on the rear lip of the top cover. It is important to remember the correct left or right channel orientation. The function and channel markings on the rear panel correspond to the front panel controls and their signal paths.

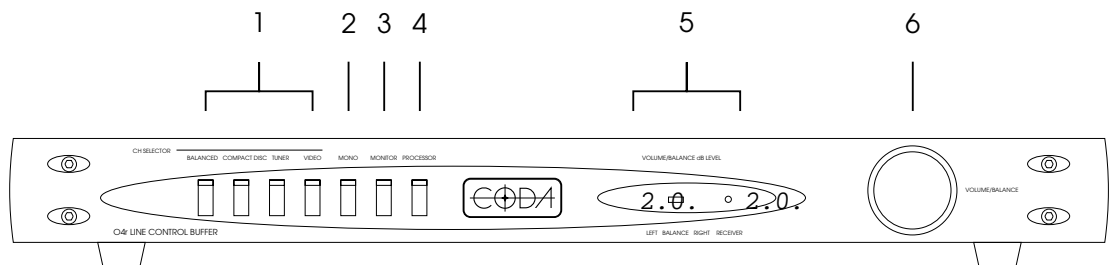
They are:

1. The BALANCED inputs should be attached to the balanced outputs of any line level source. The balanced XLR pin configuration is as follows; ground is pin 1, positive is pin 2, negative is pin 3.
2. The COMPACT DISC, TUNER, and VIDEO input connections are all line level inputs, requiring only the insertion of the RCA plugs.
3. The MONITOR inputs and outputs should be attached to a recording device; alternately, they may be used as additional line inputs.
4. The PROCESSOR inputs and outputs should be attached to a processor, equalizer, etc. alternately, they may be used as additional line inputs.
5. The UNBALANCED OUTPUT's should be attached to the amplifier inputs either directly, or through a crossover or processor, as appropriate to the application.
6. The BALANCED OUTPUT's should be attached to the balanced inputs of the amplifier, either directly or through a crossover or processor, as appropriate to the application. The balanced XLR pin configuration is as follows; ground is pin 1, positive is pin 2, negative is pin 3.
7. The AC LINE INPUT should be attached to the power cable provided with the pre-amplifier. After making the appropriate connections insert the three prong safety plug into an appropriate AC power source. Once the 04r LINE CONTROL BUFFER is properly connected, the LED display on the front panel will light. At this point, you may switch on your chosen ancillary components including the power amplifier.



III. Front Panel Control Functions

1. The CH SELECTOR set of buttons selects the source which will be presented to the outputs and balanced outputs.
2. The MONO button commons the left and right channels.
3. The MONITOR button switches in a recording device (tape deck, mini disk, ect.).
4. The PROCESSOR button switches in a audio processor (surround sound processor, equalizer, ect.).
5. Left and right volume setting is indicated by this decibel (dB) display. When the display reads 00 there is no decibel attenuation, 78 is the maximum decibel attenuation and the default setting. Just as displays in recorders read 0dB or +3dB for the maximum setting and -20dB to -40dB for the minimum setting this display functions in a similar fashion.
 To have the display read 78 for no attenuation and 00 for maximum attenuation, press and hold the button that is the current input source and then momentarily press the Volume/Balance.
- In addition the display will flash on and off when the volume is muted.
- In between the left and right display is a LED that lights when the VOLUME/BALANCE control is active in the balance mode.
- The RECEIVER is the sensor for the remote control.
6. The VOLUME/BALANCE is controlled by this optical pot. Clockwise rotation increases level, counter clockwise rotation decreases level. Left to right balance is made by pressing the knob, which then becomes a balance control. Rotating it clockwise will reduce the left channel and counter clockwise will reduce the right channel. Pressing the knob again will bring it back to being a volume control.

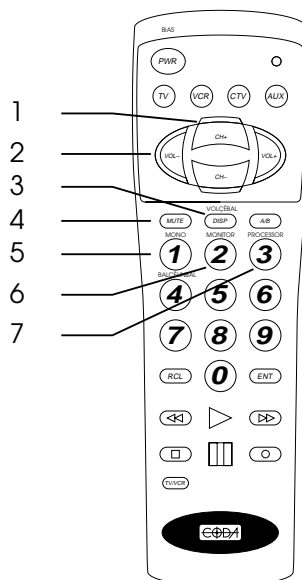


Note: The resumption of power will cause no noise pulses in the 04r LINE CONTROL BUFFER. However, some sources may produce high output voltages on turn on, which may cause damage to an amplifier or speakers .

IV. Remote Control Functions

The 04r LINE CONTROL BUFFER may be operated by remote control. To operate, set the universal remote to *AUX*. The provided universal remote can be used to control other Coda products as well as many other audio and video components. For instructions on the remotes other capabilities, refer to the Universal Remote Control Manual.

1. The CH SELECTOR up and down buttons select the source which will be presented to the unbalanced outputs and balanced outputs.
2. The VOL- and VOL+ buttons control the volume and balance level. VOL-, when in the volume mode, lowers the volume level. VOL+ raises the volume level. VOL-, when in the balance mode, raises the left channel level. VOL+ raises the right channel level.
3. The VOL«»BAL button toggles the VOL- and VOL+ buttons between volume control and balance adjust.
4. The MUTE button completely mutes the left and right channels, which is indicated by the flashing display on the 04r LINE CONTROL BUFFER. To unmute you must press the mute button again. Note: while muted you can still change the volume level.
5. The MONO button commons the left and right channels.
6. The MONITOR button switches in a recording device (tape deck, mini disk, ect.).
7. The PROCESSOR button switches in a audio processor (surround sound processor, equalizer, ect.).



I. Design Philosophy and Approach

The unique circuit topology of the FET CONTROL BUFFER 04r is the logical design response to the technical trends that are continuing within the hi-fi community. The three main factors that have encouraged this evolution follow. First, the original 2.0 Volt output standard proposed by the AES for digital sources has been disregarded. Many D to A converter and CD player manufacturers now have rms voltage outputs exceeding 3.0 Volts unbalanced and 6.0 Volts balanced. An increase from 2.0 Volts to just 3.0 Volts results in slightly over a 3 dB increase in gain alone. Secondly, as is evidenced above, fully balanced outputs have an additional 6 dB of gain relative to the unbalanced output's gain contribution to a source's voltage swing. As a result, utilizing the increasingly popular, fully balanced outputs of a source contributes 6 dB of "free" gain to a system. Lastly, loudspeaker efficiencies have been creeping upward over the last decade. The average sensitivity of high fidelity loudspeakers has risen from about 88 dB to about 91 dB, another "free" 3 dB increase in overall system gain.

The overall result of increased loudspeaker efficiency and higher voltage swings from audio sources have all but eliminated the need for preamplifiers employing exclusively voltage gain. The single remaining preamplifier circuit requirement for perhaps 95% of high fidelity systems is signal buffering. (Systems with very inefficient speakers and very low output sources located in large or heavily damped rooms may still require a preamplifier with voltage gain.) Those of you who are familiar with the classic depiction of the ideal amplifying circuit as being "a straight wire with gain", need to remember that the "gain" portion of this characterization implies that the signal is buffered. This, of course, means that if you can eliminate the need for "gain" in a device, you can't necessarily rely solely upon a "straight wire" for unaltered signal propagation in that application! This is particularly manifest when you are forced to factor in the distortion effects of cable reactances and external equipment impedance variations on a source's audio signal.

The FET CONTROL BUFFER 04r employs only a single FET source follower in the signal path up to unity gain. This is the signal level at which the voltage out of the control buffer equals the voltage into it. In this circuit configuration, it has the capability of driving virtually every amplifier currently manufactured into clipping with a source signal of around 2.0 Volts or higher. Above the unity gain level, the Control Buffer's logic circuit triggers a relay that path activates a minimalist voltage gain circuit which provides 16 dB of additional gain. Activation occurs at the -14 dB attenuation level shown on the unit's display. (There are eight discrete 2 dB steps above -14 dB.)

The utilization of buffer circuitry in lieu of gain circuitry will, in all likelihood, become a new industry standard for many high end "preamplifier" designs in the future. Additionally, logic activated path gain routing will be incorporated as an adjunct to the buffer circuitry in many of the more sophisticated remote controlled designs.

The requirements of a power supply for flawless audio reproduction are straightforward but important. The supplies in the FET CONTROL BUFFER 04r take a very direct approach to high performance. First, a top quality shielded toroid transformer with plenty of reserve current capability is used. About 19,8000 uF of capacitance with very low ESR and inductance provides good passive filtering. A high quality regulator is used with the

resulting voltage being heavily filtered. The resulting non-reactive low impedance over an extremely wide bandwidth yields a perfect power source for the individual circuits.

Most companies in the upper end of the audio industry use either sheet metal or formed aluminum. By contrast, the FET CONTROL BUFFER 04r has all structural parts made of machined extruded aluminum. The advantage of this over an all stamped chassis is that the machined metal can be worked more precisely allowing us to work on tighter tolerances and use PC mounted parts more easily. Moreover such a design allows easier servicing either for repair or for future upgrading. From the standpoint of appearance, a machined surface can be contoured in a far more precise manner, giving the final product a more seamless appearance.

II. Parts' Quality

1. Finishes - All exterior and interior metal parts are anodized. While paint may be more impact resistant, the anodized surface is more resistant to solvents and prevents corrosion. Moreover, the anodized parts' appearance can be enhanced by either graining or bead-blasting the surface.

2. Circuit Board - Circuit boards are fiberglass epoxy with gold plating over a tin/nickel barrier. This gold layer will not corrode, while the barrier plate prevents the gold from migrating to the lower copper layer and detracting from its appearance.

3. Resistors - All are high reliability metal film 1% resistors.

4. Capacitors - All capacitors are of high quality. The only electrolytics used are in the power supply where large numbers provide enormous filtering capacitance for the supply.

5. Semiconductors - There are no integrated circuits (IC) to be found in the circuit path. Very high quality dual FETs are the only source of voltage gain and were selected for their superb noise performance and precision matching. The remaining semiconductors are also of very high quality, each possessing parameters ideally suited for the specific application.

6. Connectors - Coda employs a standard RCA configuration with a gold plated case. The balanced connectors are Neutriks from Switzerland.

7. Wire - All signal wire has been eliminated whenever possible. Where wire is used, Coda employs silver plated copper, 141 strand, 18 gauge wire with a silicone insulation.

CIRCUIT SPECIFICATIONS

Frequency Response: -3 dB at 5 Hz and 200 kHz
Distortion: < .01 % from 10 Hz to 40 kHz @ 6V peak into 600 Ohms or higher, shunted by 1000 pF or less .
Gain: unity and 16 dB
Maximum Output: 10 Volts peak
Noise: > 100 dBA referenced to 1 Volt output
Input Impedance: unbalanced 20 k Ohms
balanced 20 k Ohms
Output Impedance: 50 Ohms non-reactive unbalanced
100 Ohms non-reactive balanced
Crosstalk: 70 dB @ 20 kHz

POWER SUPPLY

regulated with shielded toroidal transformer and 19,800 uf of capacitance

DIMENSIONS

Height: 1.75" Faceplate, 2.35" Overall
Width: 18.5" Faceplate, 17.0" Chassis
Depth: 9.75" Overall
Weight: 14 lbs. Shipping
Power Consumption: 10 Watts

The interior of the unit requires no special care, due to the use of sealed controls and gold plating on contacts. If it becomes necessary to clean the exterior, a simple dusting may be all that is required. If a cleaner is necessary, any dilute commercial ammonia based product will be appropriate. NEVER use any abrasive rags, cleaners or chemical solvents on the preamp.

When handling the unit, take care not to mar the aluminum. Aluminum is a medium hardness metal and can be scratched by the harder tool steels.

Avoid exposing the unit to direct sunlight, and keep it away from sources of intense heat.

Do not throw away the carton or associated packing material. They are ideal if you need to pack the unit for moving, and in the unlikely event that servicing is needed, they will be necessary for safe shipment.

Be sure to provide adequate insurance when shipping.

I. Warranty- Any failure of the FET CONTROL BUFFER 04r to operate or to meet specifications, applicable at time of manufacture, due to a manufacturing defect or component failure, will be corrected by Coda Technologies, Inc. without charge for parts, or labor for a period of **ten years five years transferable** from date of original purchase. Coda Technologies, Inc. will provide for surface transportation to and from the factory from an authorized Coda Technologies, Inc. dealer for a period of one year from date of purchase. **This warranty is transferable with proof of original date of purchase.**

II. Procedure- **If the FET CONTROL BUFFER 04r should require service under warranty, take it with proof of purchase date, with its carton and packing material, to a Coda Technologies, Inc. dealer.** The dealer will arrange for service. Direct shipments to the factory will be accepted at the discretion of the company. Coda Technologies, Inc. products purchased outside of the U.S. will be covered by those warranty conditions extended by the importing distributor which may differ in some respects from those given above. Warranty service, if required, is the responsibility of the importing distributor. If a Coda Technologies, Inc. product is removed from the country of original purchase, Coda Technologies, Inc. distributors or dealers are not obligated by the conditions of this warranty and repairs will be affected at their discretion.

III. Exclusion of Coverage- At the sole opinion of Coda Technologies, Inc. the following situations are specifically excluded from coverage:

1. Any FET CONTROL BUFFER 04r not operated in accordance with the instructions contained in this manual, or otherwise subjected to abuse, tampering, modification, accidental damage, or serial number defacement.
2. Damage to other property caused by any defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss, or any other damage whether incidental, consequential, or otherwise.
3. It is Coda Technologies, Inc. policy to extend coverage when reasonable doubt exist; however, freight charges will be billed for any units returned under warranty and found by the company to be operating according to specification.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Coda Technologies, Inc. continually researches new techniques, designs, and construction methods and so reserves the right to introduce refinements into current product lines without notice or obligation. The company may offer product modifications to make these refinements available to earlier production units.

Fill in and retain this copy of the warranty registration sheet for your records .

MODEL DESIGNATION:_____

SERIAL NUMBER:_____

DATE OF PURCHASE:_____

PLACE OF PURCHASE

Dealer:_____

Address:_____

City:_____ State:____ Zip:_____

Phone:_____

PURCHASER

Name:_____

Address:_____

City:_____ State:____ Zip:_____

Phone:_____

NOTES: _____

Please fill in and send this copy of the warranty registration sheet to Coda Technologies, Inc. Include copy of proof of purchase.

MODEL DESIGNATION: _____

SERIAL NUMBER: _____

DATE OF PURCHASE: _____

PLACE OF PURCHASE

Dealer: _____

Address: _____

City: _____ State: ____ Zip: _____

Phone: _____

PURCHASER

Name: _____

Address: _____

City: _____ State: ____ Zip: _____

Phone: _____

NOTES: _____

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