DS4

OPERATING GUIDE

ULTRASOUND AMPLIFIERS
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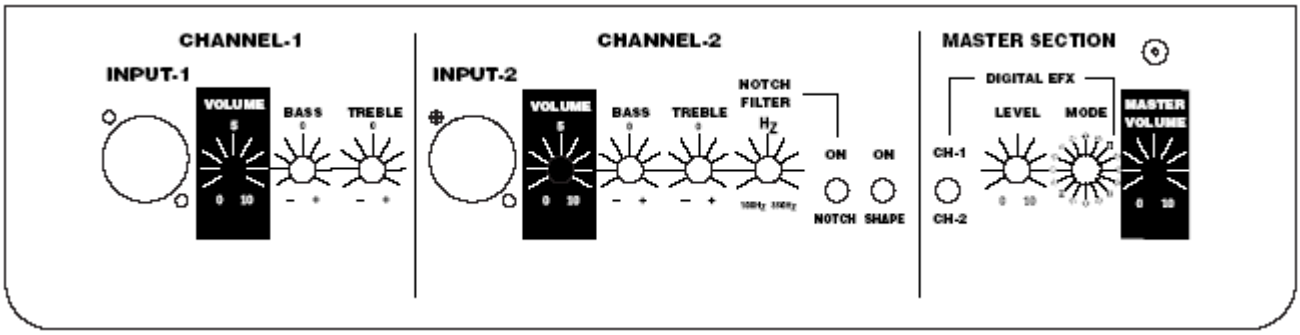
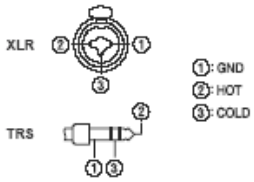
DS4 FRONT PANEL



CHANNEL-1

INPUT-1: This combo input is designed for both MIC level (XLR) (**XLR input provides Phantom power****) or Instrument level (¼") signals. **(The ¼" TRS *Tip/Ring/Sleeve* input jack is suited for equipment such as high-impedance microphones, keyboards and drum machines. It accepts both balanced and unbalanced inputs)** (Channel-1 is designed as a generic "flat response" channel which is suitable for any acoustic instrument level or microphone signal)



BASS: Adjusts the amount of cut or boost in the low frequency range.

TREBLE: Adjusts the amount of cut or boost in the high frequency range.

VOLUME: Controls the overall volume level of CHANNEL-1.

Note 1: When CHANNEL-1 is not in use, be sure to turn all controls to the minimum level to avoid any unwanted noise being passed through the amplifier.

CHANNEL-2

INPUT-2: Combo Input designed for both MIC level (XLR) and Instrument level (¼") signals. (Channel-2 is designed primarily for acoustic guitar) Try both channels to find out which channel works best for your application, some players like Channel-1 and others prefer Channel-2. With the myriad of guitars, pick-up systems, and playing styles out there, one of the channels will sound great with your gear. (**XLR input provides Phantom power****)

VOLUME: Controls the overall volume of CHANNEL-2.

BASS: Adjusts the amount of cut or boost in the low frequency range.

TREBLE: Adjusts the amount of cut or boost in the high frequency range.

Notch Filter HZ: Sets the frequency of the 18db cut NOTCH FILTER that is used to control resonant feedback.

Notch Filter**: ON/OFF** - Enables or disables the notch filter control.

Shape: ON/OFF This toggle switch enables or disables the SHAPE control. The shape control is a mid dip control. In the on position the mid frequencies will be cut and the high and low frequencies will be boosted.

** **PHANTOM POWER** – An internal phantom power source (13.6 volts) is provided for use with condenser mics. This power source is on at all times and does not affect the standard operation of the amp, even when a condenser mic is not used. We use the DIN 45-596-P12 volt standard which will operate virtually all of the live sound reinforcement condenser microphones on the market. Some "boutique" externally biased condenser mics will not be compatible and will require 48 volt phantom power. We suggest live sound condenser mics by: AKG (C4500B,4000B, etc.), Audio Technica (AT3035, 3032, Pro Series, etc.), CAD, Shure and Crown.

MASTER SECTION

Effects Assign: This 3 way toggle switch allows the digital effects to be routed to **CH-1**, **CH-2**, or if in the middle position will supply effect for both channels.

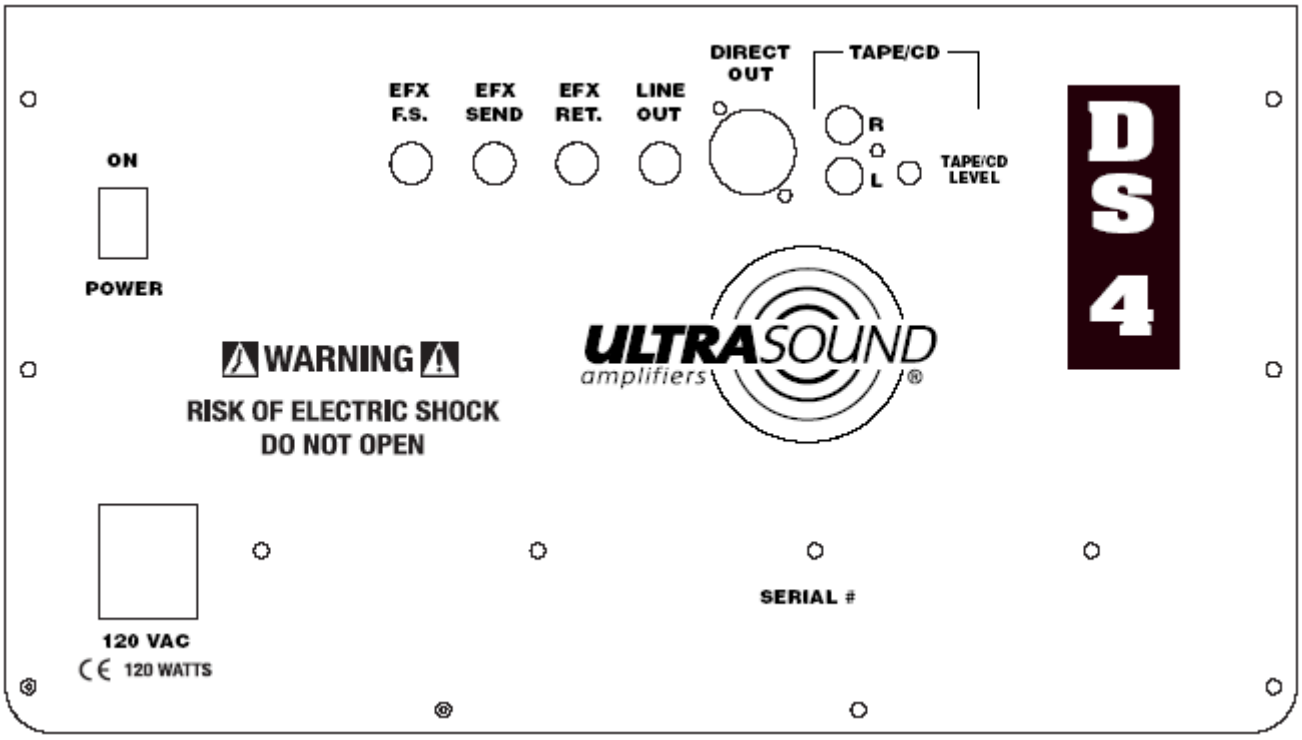
Effects **LEVEL:** Controls the amount of digital effect mixed in to the guitar signal from 0% to 50%.

Effects **MODE:** This is a rotary encoder, which selects 1 of 16 different digital effects. See Digital Effects Program List.

MASTER VOLUME: Adjusts the overall loudness of the amplifier.

Pilot Light/Limit Indicator : When GREEN, this LED indicates that the power is turned on. If the power amplifier reaches full power output, the on board ***Limiter*** will be enabled and this LED will turn RED. **The *Limiter* allows the amplifier to be played at full power without unwanted distortion.**

DS4 BACK PANEL



EFX F.S. (FOOTSWITCH): This jack is for connection to a shorting footswitch. When the switch is closed, the on board digital EFX will be bypassed.

EFX SEND: This jack provides an unbalanced output signal from the ***CHANNEL-2*** preamp for supplying signals to external low-level effects or signal processing equipment. This signal is "pre" tone controls. (The tone controls will not affect the EFX SEND signal)

EFX RETURN: Input for "returning" signals from external low-level effects or signal processing equipment. This signal is pre tone controls and EFX. **(CHANNEL-2 tone controls and on board digital EFX will affect this signal)**

LINE OUT: This jack provides an unbalanced output from the preamp that is post eq and post efx. This signal is pre MASTER VOLUME which means that this signal will not change with the MASTER VOLUME setting. This send can be used to feed a signal to a recording or sound reinforcement mixer. Additionally this output can be used to drive a slave amp or powered extension speaker.

DIRECT OUT: Balanced output signal used to feed recording or sound reinforcement equipment. This signal is post eq and post efx but is pre MASTER VOLUME.

TAPE/CD: Unbalanced phono (RCA) input jacks. This is an auxiliary input designed for use with a drum machine, tape player, CD player, etc. and can be used for playing prerecorded music.

TAPE/CD LEVEL: This "inset" control adjusts the volume level of the TAPE/CD input. This control can be adjusted with a small screwdriver. This signal is pre MASTER control which means that the MASTER volume setting will affect the loudness of the TAPE/CD input signal.

AC INPUT: Connect the female end of the AC line cord here. Connect the male plug to a suitable source of line voltage. Refer to the voltage information on the back of the amplifier for its voltage and current requirements. This connector also acts as the main fuse holder and includes a compartment for a spare fuse.

POWER: This rocker switch turns the AC power ON and OFF.

DS4 SPECIFICATIONS

- **Input**
  Impedance: 1 Meg (HI-Z) - 10K (LO-Z)
  Sensitivity: 150MV to 6V

- **EQ:** (Active)
  Bass: +/- 12db @ 150HZ
  Treble: +/- 12db @ 5kHZ

- **Shape (On)**
  +5db @ 3kHZ
  -5db @ 1500HZ
  +5db @ 100HZ

- **Notch** (Feedback Elimination)
  Range: 100 to 350HZ
  Attenuation: –18db

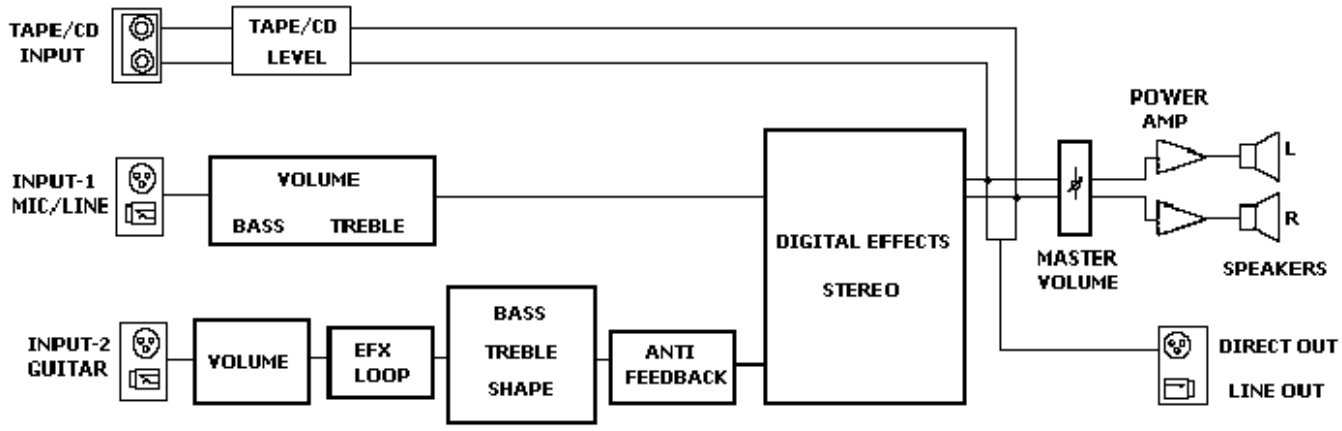
- **Line Out**
  Impedance: 10K
  Sig. Level: 300MV Nominal

- **Output**
  Power: 50W RMS (25 Watts per side stereo)
  Total Harmonic Distortion: .1%
  Signal to Noise Ratio: 98db

- **Speakers**
  Two 8" special design (coaxial)

Dimensions:

Weight: 24 pounds
Height: 13"
Length: 18"
Depth: 10 ½"



Digital EFX Program List

1. **Room 3**: Warm room reverb.
2. **Plate 1:** Classic plate reverb.
3. **Bypass:** No Effect
4. **Rotary Speaker:** Rotary speaker emulation.
5. **Chorus/Room 1:** Chorus with reverb.
6. **Chorus/Room 2:** Auto-wah guitar effect with reverb.
7. **Delay 1:** 125ms slapback delay.
8. **Delay 2:** 190ms delay for percussive arpeggios
9. **Hall 1:** Bright hall reverb.
10. **Hall 2:** Warm hall reverb.
11. **Room 1:** Hardwood studio reverb.
12. **Room 2:** Ambience for acoustic mixes and synth sounds.
13. **Chorus:** Stereo chorus.
14. **Flange:** Stereo flanger for jet wash effects.
15. **Plate 2:** Sizzling bright plate reverb.
16. **Plate 3:** Short vintage plate reverb.

Tech Tip: **Ground Loop Hum**

Sooner or later every sound person encounters a 'ground loop hum' in their sound system. Most people think that adding a Peavey PL–2 transformer module to the power amplifier rack will eliminate the problem, but this is not always the case.

In professional audio, the audio signal path should only be grounded at a single point. This single point grounding is circumvented when 2 pieces of AC powered gear are connected to each other. (Our USA National Electrical Code (NEC) specifies that all electrical equipment that draws potentially harmful amounts of current from the AC Mains must have its metal chassis grounded to the electrical systems 'earth' ground) With this being the case, any AC powered piece of gear with a 3-prong AC plug will more than likely have it's signal grounds at "earth ground" potential. This usually gives the quietest operation for the equipment.

Now, if we connect 2 or more pieces of AC powered audio gear together via signal cables, we now have the sound system's audio signal path connected to ground at two points, creating paths that also connect the audio signal to the electrical 'earth' ground. The resultant hum is directly related to the differences in current that flow in the respective electrical circuits, which all share the same earth ground.

If the audio signal path is only connected to ground at a single point, the differences in ground currents will not induce any interference from the power line, so the sound system will not hum.

Using the little gray three pin to two pin electrical AC adapter on the end of the power cord of (1) of the AC powered devices will usually solve the problem, but is not the recommended solution.

The most common problem lies in the fact that the balanced (XLR) audio connections between the mixer and amplifier have a common audio signal ground that finds its way to the electrical ground via of the multiple chassis ground connections.

The solution is to lift the audio signal or pin #1 of the balanced connector at the source of the balanced audio signal line. In this case, pin #1 should be lifted at the mixer position. This can be done with an XLR Ground Lift adapter, or if you're adept at electronics, you can lift pin #1 from ground on one end of the balanced cable, this will eliminate the ground loop hum but you may then experience 'RFI' (radio frequency interference) in the system. The solution is this case is to add a small capacitor (such as a .001 mFd) from the shield or ground wire to pin #1. Adding the capacitor allows the balanced line to be lifted (open) from ground at audio frequencies, while acting as a closed circuit for radio frequencies.

The real cause of the ground loops has to do with the way that our electrical power is distributed. In order to explain in any further detail would require a thorough discussion of electrical power distribution.

The foundation of the above tip is: **Not allowing the audio signal path to go ground in more than one place.**

IMPORTANT SAFETY INSTRUCTIONS

WARNING: When using electric products, basic cautions should always be followed, including the following:
1. Read all safety and operating instructions before using this product.
2. All safety and operating instructions should be retained for future reference.
3. Obey all cautions in the operating instructions and on the back of the unit.
4. All operating instructions should be followed.
5. This product should not be used near water, i.e., a bathtub, sink, swimming pool, wet basement, etc.
6. This product should be located so that its position does not interfere with its proper ventilation. It should not be placed flat against a wall or placed in a built-in enclosure that will impede the flow of cooling air.
7. This product should not be placed near a source of heat such as a stove, radiator, or another heat producing amplifier.
8. Connect only to a power supply of the type marked on the unit adjacent to the power supply cord.
9. Never break off the ground pin on the power supply cord.
10. Power supply cords should always be handled carefully. Never walk or place equipment on power supply cords. Periodically check cords for cuts or signs of stress, especially at the plug and the point where the cord exits the unit.
11. The power supply cord should be unplugged when the unit is to be unused for long periods of time.
12. If this product is to be mounted in an equipment rack, rear support should be provided.
13 Metal parts can be cleaned with a damp rag. The vinyl covering used on some units can be cleaned with a damp rag or an ammoniabased household cleaner if necessary. Disconnect unit from power supply before cleaning.
14. Care should be taken so that objects do not fall and liquids are not spilled into the unit through the ventilation holes or any other openings.
15. This unit should be checked by a qualified service technician if:
    a. The power supply cord or plug has been damaged.
    b. Anything has fallen or been spilled into the unit.
    c. The unit does not operate correctly.
    d. The unit has been dropped or the enclosure damaged.
16. The user should not attempt to service this equipment. All service work should be done by a qualified service technician.
17. Exposure to extremely high noise levels may cause a permanent hearing loss. Individuals vary considerably in susceptibility to noise induced hearing loss, but nearly everyone will lose some hearing if exposed to sufficiently intense noise for a sufficient time. The U.S. Government's Occupational Safety and Health Administration (OSHA) has specified the following permissible noise levelexposures.

Duration Per Day In Hours	Sound Level dBA, Slow Response
8	90
6	92
4	95
3	97
2	100
I I/2	102
1	105
I/2	110
I/4 or less	115

According to OSHA, any exposure in excess of the above permissible limits could result in some hearing loss. Ear plugs or protectors in the ear canals or over the ears must be worn when operating this amplification system in order to prevent a permanent hearing loss if exposure is in excess of the limits as set forth above. To ensure against potentially dangerous exposure to high sound pressure levels, it is recommended that all persons exposed to equipment capable of producing high sound pressure levels such as this amplification system be protected by hearing protectors while this unit is in operation.

SAVE THESE INSTRUCTIONS!