



GRACE

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Model 901

HEADPHONE AMPLIFIER

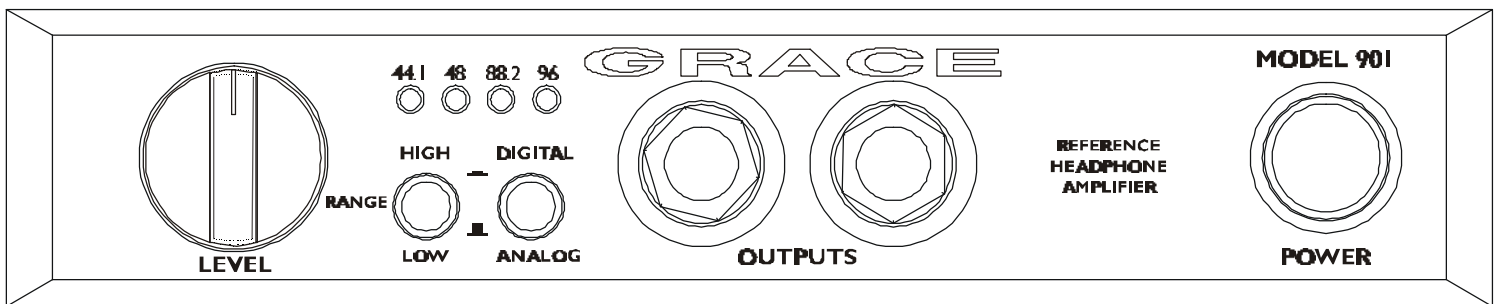
OWNERS MANUAL

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Thank you for purchasing the Model 901 headphone amplifier. It is designed to be completely reliable and easy to use. However, we ask that you take the time to familiarize yourself with some of the more important operation instructions in this manual to avoid most common user problems.

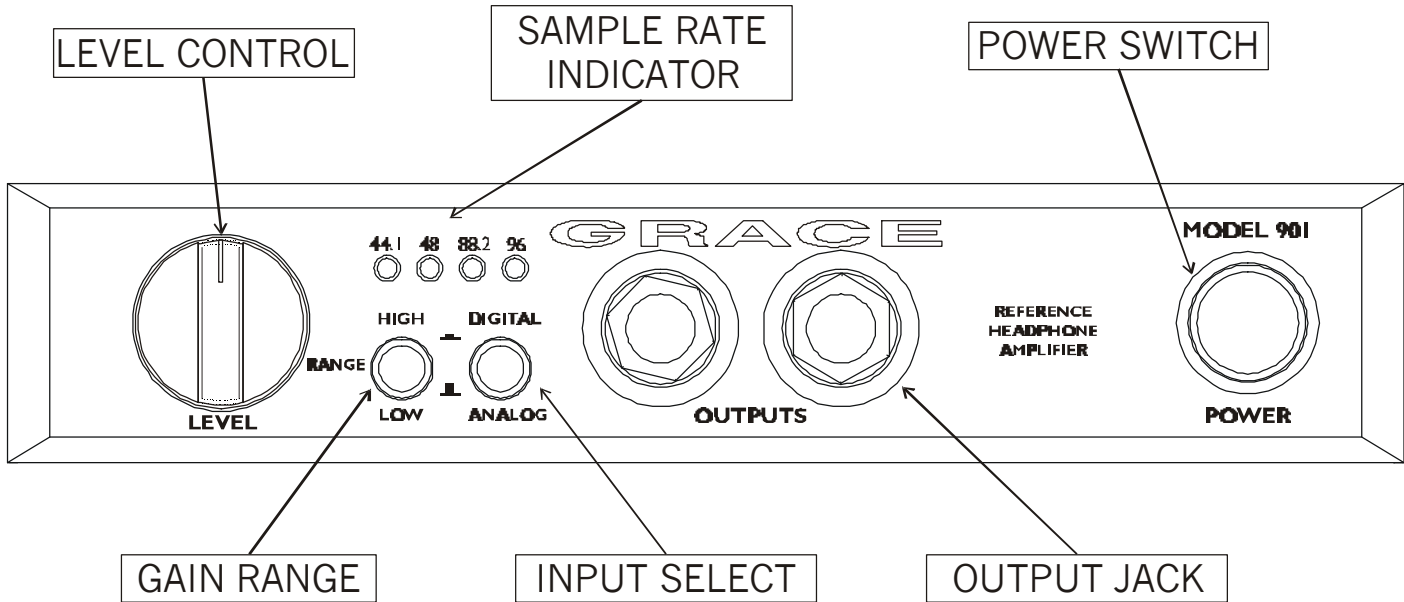
The Model 901 amplifier is an ultra high fidelity monitoring device. By revealing *all* of the contents of your signal, we hope it helps you achieve a new level of excellence in your audio recordings.

Feel free to check out our internet web page for the latest information regarding your amplifier. You can always find the latest owners manuals and other technical documents at:

<http://www.gracedesign.com/documents/docs.html>

MODEL 901 FEATURES

- Balanced XLR analog inputs
- Unbalanced RCA analog inputs
- AES, SPDIF and TOS LINK digital inputs
- High current output amplifier drives 8 Ohm loads
- 24 position level attenuator with .05dB channel matching
- Internal linear power supply
- High current, low noise torroidal power transformer
- No electrolytic capacitors in the signal path
- Highest quality metal film resistors
- Ultra low distortion 24 bit DAC accepts sample rates up to 96kHz
- Automatic digital de-emphasis filter
- 10dB gain boost switch for -10 sources
- Fast, musical transpedance output amplifiers
- Precision instrumentation balanced input amplifiers
- Sealed gold contact relays for input select and gain boost switching



FRONT PANEL CONTROLS

LEVEL CONTROL The 901 level control is assembled with an ultra precision 24 position gold contact switch. Using low inductance surface mount metal film resistors this switch is the ultimate attenuator for sonic fidelity and level accuracy. Left-right channel balance is maintained to within 0.05dB at any setting. The attenuation curve is shown in the table below.

| POSITION | ATTENUATION | POSITION | ATTENUATION | POSITION | ATTENUATION |
|----------|-------------|----------|-------------|----------|-------------|
| 24 | 0 | 16 | -16 | 8 | -32 |
| 23 | -2 | 15 | -18 | 7 | -34 |
| 22 | -4 | 14 | -20 | 6 | -38 |
| 21 | -6 | 13 | -22 | 5 | -42 |
| 20 | -8 | 12 | -24 | 4 | -46 |
| 19 | -10 | 11 | -26 | 3 | -50 |
| 18 | -12 | 10 | -28 | 2 | -60 |
| 17 | -14 | 9 | -30 | 1 | -∞ |

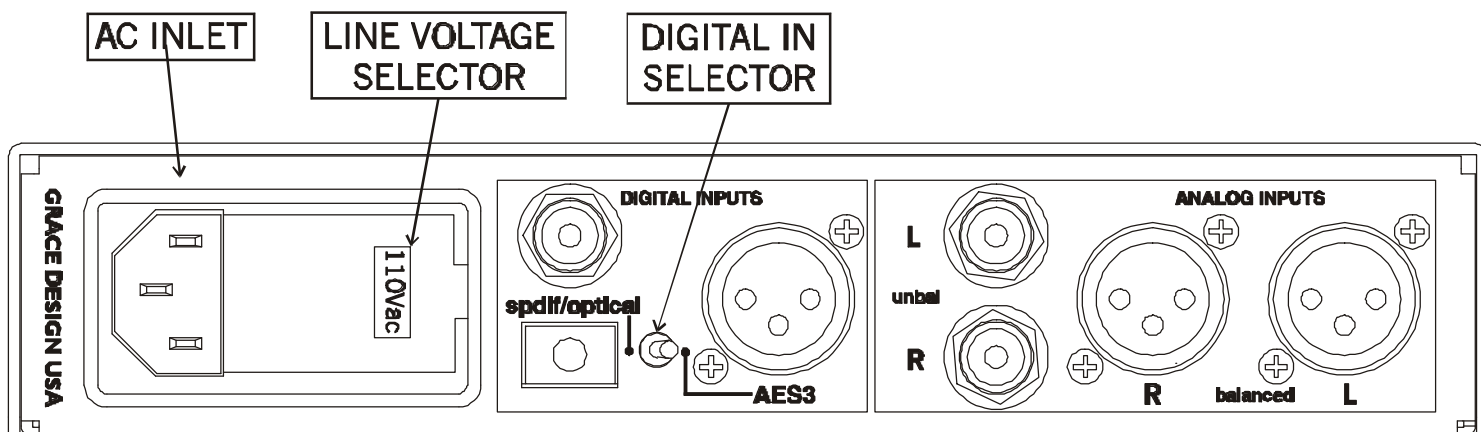
GAIN RANGE The gain range switch provides an extra 10dB of gain for monitoring -10dB signals or use with low sensitivity headphones. With the LEVEL CONTROL at maximum, the LOW gain position provides +10dB overall gain when using the analog inputs. When using the digital input, this setting will yield +20dBu out at 0dBFS. When the GAIN RANGE switch is depressed the overall gain is +20dB

INPUT SELECT This switch selects the input source. With the switch out the analog inputs are selected. XLR balanced and RCA unbalanced connectors are provided on the rear panel. When the INPUT SELECT switch is depressed the digital inputs are selected. AES3, S/PDIF and optical inputs are provided on the rear panel. A toggle switch on the rear panel selects between the AES and S/PDIF-optical inputs.

SAMPLE RATE INDICATORS The LED sample rate indicators display the digital input signal sample rate. The sample rate is determined by a frequency comparator, not by the sample rate bits in the digital data. This ensures that the proper DAC filter settings are used even if there are erroneous sample rate bits in the signal. Sample rates of 44.1, 48, 88.2 and 96kHz are directly indicated. 32kHz is indicated when the 44.1 and 96 LEDs are both illuminated.

OUTPUT JACK The two output jacks are wired in parallel so that two sets of headphones can be used simultaneously. They are wired left channel to the tip, right channel to the ring and ground to the sleeve.

POWER SWITCH The power switch connects power from the AC input module to the preamplifier circuitry. When depressed, the POWER SWITCH will illuminate.

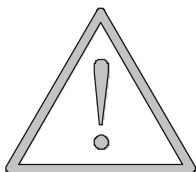


REAR PANEL CONTROLS

AC INLET The 901 accommodates a standard IEC power cable. The IEC inlet contains a built in RFI filter.

LINE VOLTAGE SELECTOR To change the line voltage use a small screwdriver to pry open the voltage select door. Carefully remove the voltage select cam and insert with the desired voltage showing. Use the table below for voltage settings and fuse values.

| CAM SETTING | LINE VOLTAGE | | | FUSE VALUE |
|-------------|--------------|--------|--------|------------|
| 110Vac | 100Vac | 120Vac | | .25A SLOW |
| 220Vac | 220Vac | 230Vac | 240Vac | .125A SLOW |



WARNING: The Model 901 is capable of delivering over .5 Amperes of current to the headphone jack. The nature of the TRS jack allows for the ring to be shorted to the sleeve when the plug is partially inserted. If the plug is left partially inserted and there is a high amplitude signal on the output of the amplifier the line fuse will blow. Always replace the line fuse with the proper type fuse or damage to the amplifier can occur. Note that this fault condition will not harm your headphones.

DIGITAL IN SELECTOR The digital input selector switch selects either AES or S/PDIF and optical signals. When the switch is set in the S/PDIF/optical position either input can be used but only one can be used at a time.

ANALOG INPUTS The 901 provides both balanced and unbalanced inputs. Input connections are made using the female XLR connector on the rear panel. These connectors are wired with pin 2 positive, pin 3 negative and pin 1 ground. The unbalanced phono type jacks are wired in parallel with pin 2 of the XLR balanced jacks. Connecting unbalanced and balanced signals simultaneously is not recommended.

Model 901 Specifications

GAIN

Normal Mode -∞ to +10dB

Boost Mode -∞ to +20dB

FREQUENCY RESPONSE

@ 0dBu out +/- .25dB 22Hz - 120kHz

@ 0dBu out +/- .5dB 12Hz - 260kHz

@ 0dBu out +/- 3dB 4Hz - 600kHz

MAXIMUM OUTPUT LEVEL

@ 1kHz, 50 Ohm load +23dBu (10.9Vrms, 30.8V p-p)

INPUT IMPEDANCE

40K Ohms balanced

20K Ohms unbalanced

OUTPUT IMPEDANCE

5 Ohms

DYNAMIC RANGE

@ 0dB gain, 50 Ohm load 116dB

@ -10dB gain, 50 Ohm load 121dB

CMRR

3.5Vrms in, 10dB gain >75dB

DISTORTION

THD+N

10dB gain, +10dBu out, 50 Ohm load 0.0051%

SMPTE

4:1 10dB gain, +10dBu out, 50 Ohm load <0.012%

ATTENUATOR CHANNEL MATCHING

<0.05dB

D/A SPECIFICATIONS

Input sample rate

44.1, 48, 88.2, 96kHz

Input word length

16 to 24 bits

THD+N

44.1kHz, 24bit, 1kHz, +20dBu out

0.0016%

NOISE FLOOR

0dB gain, 22-22kHz

-95dBu

0dB gain, A-weighted

-102dBu

POWER REQUIREMENTS

115VAC

.16A

230VAC

.08A