



Ear+ HD300
Limited Commemorative Edition
High Definition Stereo Headphone Amplifier



Users' Manual

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Mapletree Audio Design
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Introduction

The Mapletree Audio Design *Ear+ HD300* Stereo Headphone Amplifier is a special limited edition (2 units made) to commemorate the 300th unit in the *Ear+* family of headphone amplifiers going back to 2002. It utilizes a unique tube set comprising two EF37A pentode drivers and a 6AS7G dual triode output tube. The passive component selection includes Panasonic polypropylene film output capacitors, vintage Philips carbon film resistors, and Auricap polypropylene film interstage coupling capacitors. All tubes are heated with a dc voltage supply. The high voltage rectification employs a solid-state bridge of high-speed silicon diodes driving a heavy-duty capacitive filter. Both the heater and high voltage supplies utilize toroidal power transformers for high efficiency and low noise.

Input/Output Connections

The standard IEC line cord is attached to the receptacle on the rear panel of the *Ear+ HD300*. It is compatible with a 115-125 VAC line with a frequency of 50–60 Hz. A 2-3 A/250 V fuse provides primary protection for the power supply. It can be accessed by removing the bottom chassis cover. ***Turn off the power and unplug the unit at least 60 sec before removing the cover. Replace the cover before again applying power.*** Under normal conditions, it should not be necessary to replace the fuse. If power fails to come on, you can check the fuse and replace with a spare if necessary. If the fuse blows a second time, you should not try to operate the unit. Contact Mapletree Audio Design for information regarding service.

Two sets of *Input* RCA jacks are provided on the rear panel, which allow connection to a line-level stereo source (e.g. CD player) and to the line input of a preamp or integrated amp without the need for a Y-adapter. The input impedance (with only the source connected) is 100 k Ω , which is compatible with all source output circuits. The input sensitivity is 0.1 V to produce 10 mW power into 32 Ohm headphones.

The headphone output jack is a ¼" locking stereo phones jack with the left channel connected to the tip contact. The headphones plug is released by depressing the red tab at the bottom of the jack. If your headphones are terminated in a 1/8" (3.5mm) plug, an adapter is required (usually supplied with your headphones). Headphone impedances from 16 Ω to 600 Ω are suitable for use with the *HD300*.

Controls

The switch on the left of the front panel turns on the ac power to the amplifier. The power on condition is indicated by the illumination of the pilot light. It takes about 30 seconds for the tubes to reach operating temperature ready for use. During this time, you may hear a low level hum through the headphones, which will then disappear completely. The front panel volume control acts on both channels simultaneously. Tracking between channels is typically better than 0.5 dB over the control range.

Heat

It is normal for the chassis to become quite warm after an hour or so. During operation, around 70 W of power is continually dissipated as heat, even when no input signal is applied. This is characteristic of a class A power amplifier, even a low power one such as the *HD300*. In order to provide heat conduction through the vent holes along the sides of the chassis, it is important that there is a clear passageway on either side for air to circulate. It is not recommended that the amplifier remain powered on when not in use. Heat is the main factor in shortening the life of passive components such as electrolytic capacitors inside the chassis. Unlike incandescent light bulbs, tube lifetime is largely unaffected by the on-off-on power cycle. They do have a finite operational lifetime (1000s of hours), so there is no reason to waste it (not to mention energy).

Tubes

A tube burn-in period of several hours may be needed to achieve the best sonic performance. Tube life should be thousands of hours. Aging tubes may result in a reduced gain in one or both channels or an increase in noise levels. Infrequently, a heater may burn out which is indicated by total loss of sound.

You have been supplied with two new old stock (NOS) Mullard EF37A pentode driver tubes, which were made in the United Kingdom, probably in the 1960s. These are low noise versions of the earlier EF36 and EF37 tubes and were the prototype for the EF86 miniature audio pentode. The 6J7 (metal) and 6J7G are electrically equivalent and can be substituted in the *HD300*. The 1620 is a special low-microphonic military/industrial version of the 6J7. Other variants include MG (glass inside an aluminum can) and spray-shield types.

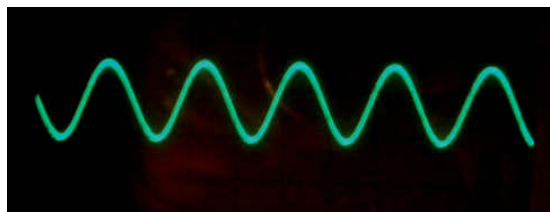
The 6AS7G is a dual triode developed in the late 1940s for series voltage regulator application. It is a low μ , low plate resistance, and relatively high transconductance tube which make it a useful output tube for a headphone amplifier where a low output impedance is desirable. In fact, in this circuit, an output impedance of 3.2 Ω is measured. This provides an excellent damping factor even for low impedance headphones. Just as for loudspeakers, a high damping factor (the ratio of load impedance to amplifier output impedance), is important in maintaining tight control of diaphragm movement of your headphone drivers at low frequencies. There are a number of electrical equivalents for the 6AS7G including the 6AS7GA and 6080, both of which can be used with the *HD300*. A currently manufactured version of the 6AS7G is available from China. Replacement tubes can be obtained from several suppliers in the U. S. and Canada.



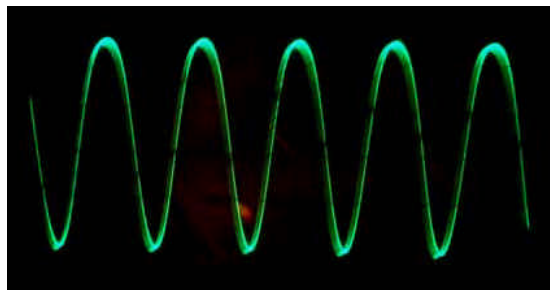
MAD Ear+ HD300 Specifications

Frequency response at 10 mW output (50 Ω load): 20 Hz–20 kHz –0.5 dB

Maximum undistorted output at 1 kHz (50 Ω load): 0.2 W (0.3 W into 32 Ohm load)



Undistorted output waveform (20 mV, 50Ω load, 1 kHz)



Output at onset of visible distortion (overload) (300 mV, 50Ω load, 1 kHz)

Max gain: 15 dB (voltage gain = 5.6)

Channel balance: within 0.5 dB at all volume control settings

Output impedance at 1 kHz: 3.2 Ω (damping factor = 10 with 32 Ω headphones)?

Input impedance: 100 k Ω ?

Hum and noise at output (max volume): less than 0.1 mV rms

Recommended load impedance: 16–600 Ω

Phase: non-inverting

Power consumption: 70 W, 120 VAC 50-60 Hz

Care of your HD300

The chassis finish is lacquer based and is resistance to scratching. However, it may not withstand strong chemical cleaners including alcohol or glass cleaner. Dust the chassis and tubes with a soft 2" paintbrush from time to time and your *HD300* will enjoy a very long life.

Warranty

Factory assembled MAD components are warranted for 2 years to the original purchaser for failure of all parts (excluding tubes). Tubes are warranted for 90 days exclusive of shipping cost. Service, including parts and labor (but excluding shipping), is free within the warranty period.

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