

Wheatfield Audio

HA-2 Headphone Amplifier
User's Manual

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Safety

The HA-2 is a tube headphone amplifier. As such, there are some safety precautions that you need to observe.

**CAUTION:**

**HOT SURFACES. KEEP COMBUSTIBLES AWAY FROM TUBES.
DO NOT BLOCK AIR FLOW AROUND AMPLIFIER.**

**DANGER:**

**TO PREVENT ELECTRIC SHOCK, DO NOT REMOVE COVER. NO
USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO
QUALIFIED PERSONNEL.**

First, the tubes are hot... *really* hot. The 6AS7G tube in particular is specified to operate at up to 200° Celsius – that's 392° Fahrenheit. If you touch the tubes when the amplifier has been running for a while you will likely get burned.

Because of this, please, *please* keep small children away from the amplifier. If you have small kids in the house, locate the amplifier out of their reach, and never leave it turned on unattended, even for a moment.

Also, make sure that you don't locate the amplifier near anything that could create a fire hazard. Don't place it near curtains, for example, or bedding, or anything else that is flammable. Make sure that there's nothing but air within a foot of the tubers on top of the amplifier.

Second, there are high voltages inside the chassis of the HA-2 – *really* high voltages, up to 540 Volts. Do not open the chassis of the HA-2 unless you are qualified to do so. If you have any doubts, don't do it – refer service to somebody that is familiar with working on tube equipment.

Like any electronic equipment, do not operate the HA-2 near water, or in any location where it is likely to get wet. If by some accident water or other liquid is spilled onto the amplifier, unplug it immediately. Take it to a competent service technician and have it checked out, dried off, and cleaned before plugging it back in.

If for some reason the fuse on the HA-2 blows, replace it only with the same type of fuse that was originally installed. The HA-2 uses a slow-blow, 1.5A 250V, AGC-type fuse.

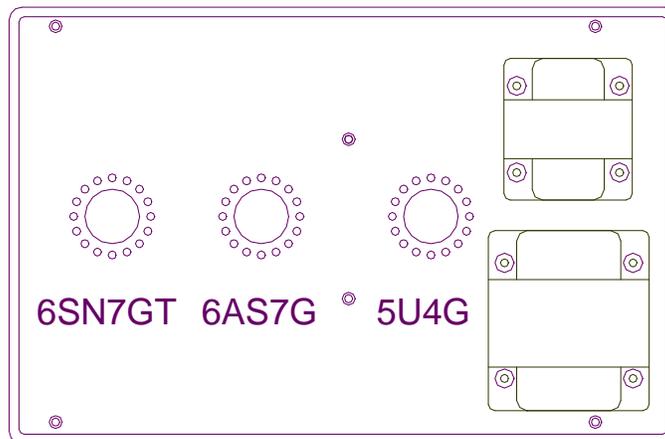
Unpacking, Setup, and Connection

Unpacking the amplifier

Carefully unpack your HA-2 amplifier. Inside the package, you will find the amplifier chassis, the tubes (packed separately), a power cord, and this manual (guess you already found *that*, huh?) It's always a good idea to save the original packing material.

Installing the tubes

There are three different tubes used in the HA-2. Note the tube types, which are printed on the tube boxes. Referring to the drawing below, remove each tube from its box and install it into the corresponding socket on the amplifier. The tubes are keyed, so rotate the tube until its key matches up with the one on the socket, and press it down into the socket as far as it will go.



Make sure that the tubes are installed in the right locations. **DOUBLE-CHECK!** If you turn the amplifier on with the tubes in the wrong spots, you will likely ruin the tube, and may do damage to other amplifier components as well.

Connecting the amplifier

Plug the power cord into the amplifier, and the other end into a wall outlet. Connect the audio inputs of the HA-2 to your CD player, pre-amp, or other source, using standard RCA-type audio cables. Note that the input connectors are color-coded, red for the right channel and white for the left. Plug your headphones into the connector on the front.

You're ready to listen!

Listening with the HA-2

It's best to start out with the volume control knob turned all the way down (counter-clockwise) until you're familiar with the HA-2.

Turn the amp on, using the front panel power switch. It's OK to leave your headphones plugged in when you turn the amplifier on and off – there is very little turn-on/turn-off “thump” generated, since the amplifier warms up slowly.

Speaking of warm-up, the amplifier takes only a half minute or so to start working, though you may find that it takes a couple of minutes for the sound quality to reach its best.

Adjust the volume to your liking. The HA-2 doesn't have a lot of gain, so most people wind up listening with the volume control almost halfway up. Even with the volume control all the way up, unless you have an unusually high-level source, you will still have plenty of “headroom” before the HA-2 starts to distort.

All the musical detail is there, even at very low volume. Try listening in an absolutely quiet room sometime, with the volume fairly low. It's amazing!

About Headphones

To get good sound from the HA-2, you need good headphones. Cheap headphones driven by the best of amplifiers will still sound like cheap headphones.

The HA-2 is designed to drive high-quality headphones of greater than 100 ohms impedance. Pretty much all of the headphones made by Sennheiser, AKG, and Beyerdynamic fit into this category.

The HA-2 will drive headphones of lower impedance, like those from Grado, Koss, or Sony, but we don't recommend it. The mismatch of impedance between the amplifier and such headphones introduces larger amounts of distortion. Low-impedance headphones are best driven from solid-state amplifiers, or conventional tube amplifiers that use output transformers.

You can't hurt the amplifier by plugging in any type of headphones.

The Tubes

Tubes don't last forever, so you can expect to replace the tubes from time to time. If you notice degradation of the sound, or a lowering of the volume, it may be time to replace the tubes.

You can replace the tubes yourself. Just find a high-end Hi-Fi shop that sells tubes, or look on the internet – there are a number of companies that sell tubes on-line for very reasonable prices. Purchase the same tube types as what was originally supplied in the amplifier.

You don't have to use tubes made by the same manufacturer as those shipped with the amplifier – any tube with the same type is OK. Also, the “style”, or glass shape of the tube, can be different. For example, we may use a Sovtek 5U4G rectifier tube. You can replace it with an RCA 5U4GB tube.

Wheatfield Audio's Warranty

Your HA-2 amplifier is warranted to be free of defects for a period of one year after you receive it. If anything fails during that time, *excluding the tubes*, we will fix it for free. You will have to take it, or pay to ship it, back to where you bought it.

The tubes are warranted for a period of six months.

After the one year warranty period, contact the dealer that sold you your HA-2 if you have a problem. He can either fix it or arrange to get it back to us to fix.

Tweaks

We think that the HA-2 is a fine amplifier, right out of the box. It was designed with what we believe is an optimal combination of components.

That being said, many audiophiles are never satisfied with any piece of equipment until they've "tweaked" it in their own special way.

We don't recommend that you make changes to the amplifier. If you choose to modify the amp or change any components, your warranty is void, so you're on your own.

We will make one exception to this rule, however. That exception is the tubes.

You may replace the tubes with others OF THE SAME TYPE if you desire, without endangering your warranty.

Since the HA-2 is a manufactured product, we have to use components that are readily available, in quantity, month after month. That means that we use Russian tubes that are still in production, generally from Sovtek.

Though the Russian tubes we use sound great, it is possible that the sound could be improved by the use of NOS (New Old Stock) tubes. Good NOS tubes for audio use are tubes made between World War II and the '80's, in the USA and Europe.

The best potential for improving the sound of the HA-2 is to replace 6SN7 voltage amplifier tube with a good NOS tube, like one from Amperex. Replacing the 6AS7 is likely to have less of an audible affect, and replacing the 5U4 rectifier will probably have no audible affect at all.

Specifications

Note: Specifications listed are typical, and are derived from measurements on actual amplifiers. There will be some variation from one amplifier to the next. Specifications are subject to change without notice.

Description

Single-ended, OTL, class-A triode amplifier
 Single voltage amplifier stage, single cathode follower stage
 DC-coupled input; capacitor-coupled output.

Tube complement

1 - 6SN7GT voltage amplifier (one section used for each channel)
 1 - 6AS7G cathode follower (one section used for each channel)
 1 - 5U4G rectifier

Power supply

Full-wave tube rectifier
 Capacitor-input filter with choke, using electrolytic and polypropylene capacitors
 AC filament supply

Dimensions

13" wide x 8.5" deep x 8" tall
 (including tubes)

Power requirements

120VAC 60Hz only
 100 Watts

Fuse type

AGC-type, slow-blow, 1.5A 250V

Output Impedance

100 Ohms

Maximum output level

(1kHz, 5% THD)
 620 ohm load: 13V RMS / 36V P-P
 270 ohm load: 10.5V RMS / 30V P-P

Rated Maximum continuous output power

(1kHz, 5% THD)
 620 ohm load: 270mW
 270 ohm load: 400mW

Total Harmonic Distortion

(1kHz, 1V RMS out)
 620 ohm load: < TBD %
 270 ohm load: < TBD %

Voltage Gain

620 ohm load: 17dB
 270 ohm load: 15dB

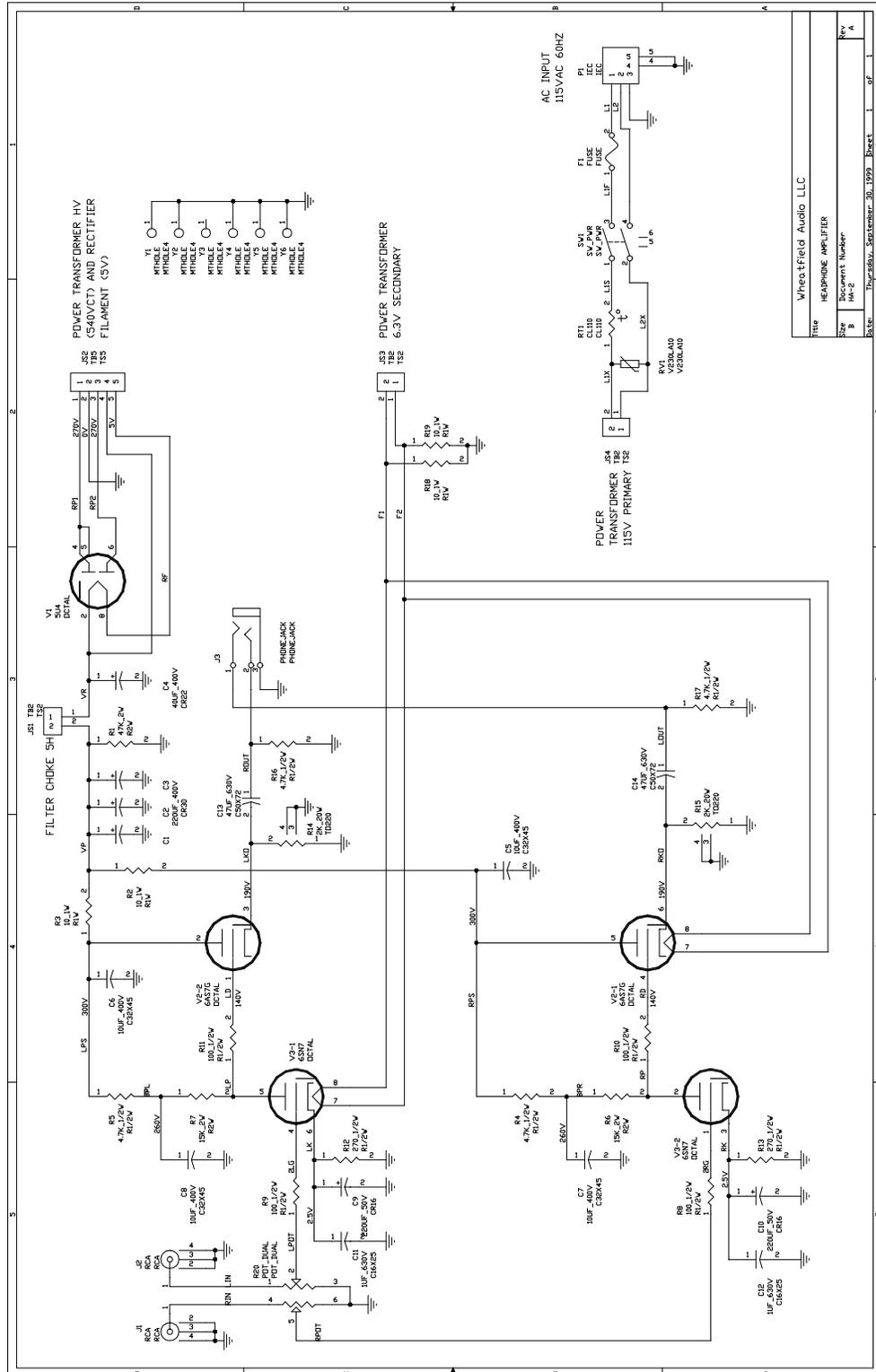
Frequency Response

(+/- 3dB)
 620 ohm load: ~10Hz – 75kHz
 270 ohm load: ~15Hz – 75kHz

Ripple and Noise

< 3.5mV RMS

Schematic Diagram



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