BRYSTON

A Lifetime of Music

MEMO: To All Bryston Customers
SUBJECT: German Review of Bryston BHA-1 Headphone Amp

STEREOPLAY

Full Steam Ahead!

High performance amplifiers have always been a domain of Bryston. With the BHA-1 the Canadian HiFi specialist now turns to the owners of especially high quality head phones

It is surely not presumptive to assert that the majority of headphone jacks in HiFi components represent compromise solutions. Most of the time the budget is tight and invested in other more sales oriented items, which is why it rarely suffices for truly high quality headphone electronics. Although with standard solutions, for instance with the popular OP-amplifier chips JRC 4556 from New Japan Radio, quite good results can be

attained, there is no doubt that with a separate headphone amp upmarket listeners play in a different league.

Until now only very few specialists devoted themselves to the area of pure headphone amps. With the worldwide boom, especially with very high quality headphones, this area is now also interesting for larger manufacturers whose primary core competence is building amplifiers. The best example for this is Bryston. With the BHA-1 (for 1,600 Euro) the Canadian manufacturer now introduces his first full-blown headphone amp. Stop, that's not quite accurate, since the BHA-1 thanks to its adjustable line outputs can also be used as a line level preamp. The BHA-1 provides three analog inputs selectable via a toggle switch on the substantial aluminum front panel which accept all types of program sources from smart phones to sound studio mixing consoles. There is an electronically balanced XLR input, an unbalanced RCA input with RCA jacks as well as a likewise unbalanced input with a 3.5 mm. stereo minijack for mobile equipment.

The Name is the Program:

The abbreviation "BHA-1" stands for "Balanced Headphone Amplifier." Similarly like a bridged power amplifier which drives loudspeakers, the BHA-1 can handle both headphones of the listener completely ungrounded by means of two opposite phase amplifier sections. (refer to the section Headphone Bridged Amplifiers..." on Page 45) A prerequisite for this is that both transducers in the headphones can be controlled in balanced mode without the necessity of a ground. Also "normal" headphones can be connected to the BHA-1 with the usual three pole phono plug; in this case, however, only the non-inverting output stage delivers the music signal.

During the listening test the Bryston BHA-1 showed itself to be absolutely neutral, despite that a multifaceted show-off with raven-black bass. Thanks to its gigantic power there should never be a loudness or lack of dynamics problem even with the ultra softest headphones. The headphone transducers would "melt" before the BHA-1 causes distortion.

The comparison between unbalanced and balanced operation was very interesting with the HD 800 which Stereoplay could elegantly carry out thanks to its specially made balanced CH 800S connection cable. In unbalanced mode the German-Canadian duo played more in the center and altogether a bit more organic, and in balanced mode - thoroughly in a positive sense - somewhat "snappy" and even more emphatic in the bass region, and additionally it seemed spatially somewhat wider. With balanced operation the impression arose that the overall reproduction succeeded one tick "faster" and more explosive.

According to personal taste one can give preference to both connection modes. However with objective observation one must concede balanced operation small advantages with a somewhat more businesslike interpretation, while the unbalanced mode in musical regard showed somewhat more boundedness. The best part is that

with the Bryston BHA-1 both variations can be realized. Also as a line preamp the Canadian cut a good figure soundwise, the only small weakness was a very high voltage gain (amplification) so that one could really never get beyond the 10 o'clock position with the volume control.

Jürgen Schröder

Stereoplay Test Rating:

- Measurement Values 9
- Practical application 8
- Value 10
- Sound - Absolute Top Class

Elaborate circuit technology and bridged configuration help the BHA-1 amplifier achieve forceful-clear, compression free sound with exemplary clean bass. Can supply exorbitant volume intensity - not only in balanced mode.

CAPTIONS:

With an optional Rack Mounting Kit the BHA-1 Headphone Amplifier, thanks to its 19 inch compatible measurements, can also be mounted in sound studio peripheral racks without any problems. The backside arranged connections for the line inputs and preamp outputs also simplify the cabling. The enormously robust steel cabinet deserves the rating "unconditionally road-worthy."

The circuitry of the BHA-1 Headphone Amplifier consists primarily of six discretely built-up (with individual transistors) operational amplifiers, of which two serve as input amplifiers (above), and the other four in channel connected pairs as bridged amplifiers (below). The analog operating loudness potentiometer from Noble (little blue box) follows in the signal path after the balanced input stage.

Besides the standard wired four pole XLR-4 jack the BHA-1 Headphone Amplifier also offers the connection alternative of two channel separate three pole XLR-3 jacks for headphones that can be operated in balanced mode. The driving amplifier stages are however the same.

Balanced Headphone Connection:

Headphones which are suitable for balanced connection to appropriately operating head-phone amplifiers are recognizable inasmuch as then both transducers, comparable to phono cartridges, require one plus and one minus connection as separate channels. Accordingly a balanced headphone cable must have four inner conductors, which likewise may have no connection to each other.

High quality headphones often already incorporate quadripolar connection cables, where-in the minus connection of both channels is often connected to the ground contact (rear, broad area of barrel) of a conventional phono plug. If one wants to rebuild such a cable for balanced usage, it is recommended that a four pole XLR plug be soldered according to the following schematic diagram:

Bridged Headphone Amplifiers - Why?:

Fully bridged- or Bridge-Terminated-Load-Amplifiers (abbreviated: BTL) consist of two amplifiers per channel, one of which outputs a normal, the other a 180 degree turned (inverted) input signal. Although bridged amplifiers - no matter whether for headphones or loudspeakers - are not principally superior to conventional amplifiers they do offer so to speak inherently two constructive plus points: By means of the opposite phase method of operation, from the inverting and non-inverting bridge branch, they can supply very high output levels even with relatively low supply voltages, which in turn produce high, undistorted maximum volume levels even when connected to difficult to operate, high resistance headphones with impedances over 300 ohms. A further advantage of bridged amplifiers is that the load (headphones, loudspeakers) remains balanced and not grounded, i.e. it floats between the inverting and non-inverting amplifier output. Consequently with bridged amplifiers the electrical floating ground as a point of reference is irrelevant since the load is now transferred back and forth between the modulated positive and negative supply voltages. Attributable to its floating output signal, bridged amplifiers are inherently less susceptible to load dependent crosstalk, which can easily occur with single ended amplifiers. The reason for this is as follows: If the load current flows over the floating ground on the way back to the power supply, then because of a not infinitesimal conductor resistance a voltage drop occurs, which modulates the reference point of the entire circuitry dependent on the size of the signal. If the left and the right channel split the floating ground which is especially the case with headphone amplifiers because of their three pole phono jacks, then channel crosstalk can occur. Therefore well thought out and in addition low resistance ground routing is the first commandment for normal headphone amplifiers. However the ground free operation of bridged headphone amplifiers requires that the headphones being used are connected with a four conductor cable to the output.

Translated from the German by Peter Ullman