



## *Installation and Operation Manual*



### **HPA-4 Plus** *4 Channel Headphone Amplifier with Talkback/Cue*

Manual Update: 09/24/2007

Due to the dynamic nature of product design, the information contained in this document is subject to change without notice. Broadcast Tools, Inc., assumes no responsibility for errors and/or omissions contained in this document. Revisions of this information or new editions may be issued to incorporate such changes.

*Broadcast Tools® is a registered trademark of Broadcast Tools, Inc.  
Copyright, 1989 - 2007 by Broadcast Tools, Inc. All rights reserved.  
No part of this document may be reproduced or distributed without permission.*

Visit [www.broadcasttools.com](http://www.broadcasttools.com) for important product update information.

## INTRODUCTION

Thank you for your purchase of the Broadcast Tools® **HPA-4 Plus, 4 Channel Headphone Amplifier with Talkback/Cue** which we will refer to through out the manual as the **HPA-4 Plus**. We're confident this product will give you many years of dependable service. This manual is intended to give you all the information needed to install and operate the product.

## SAFETY INFORMATION

Only qualified personnel should install Broadcast Tools® products. Incorrect or inappropriate use and/or installation could result in a hazardous condition.

Broadcast Tools, Inc., is unable to support NON-Broadcast Tools software, hardware or NON-Broadcast Tools computer/hardware/software problems. If you experience these problems, please research your hardware/software instruction manuals or contact the manufacturers technical support department.

## WHO TO CONTACT FOR HELP

If you have any questions regarding your product or you need assistance, please contact your distributor from whom you purchased this equipment.

If you would like more information about Broadcast Tools® products, you may reach us at:

**Broadcast Tools, Inc.**  
131 State Street  
Sedro-Woolley, WA 98284-1540 USA  
Voice: 360.854.9559  
Fax: 866.783.1742

Internet Home Page: [www.broadcasttools.com](http://www.broadcasttools.com)  
E-mail: [support@broadcasttools.com](mailto:support@broadcasttools.com)

**THANK YOU FOR CHOOSING  
BROADCAST TOOLS® BRAND PRODUCTS!**



**CAUTION!**

**Broadcast Tools®** Products, as with any electronic device, can fail without warning. Do not use this product in applications where a life threatening condition could result due to failure.



**NOTE:**

This manual should be read thoroughly before installation and operation.

## WEBSITE:

*Visit our web site for product updates and additional information.*



## INTRODUCTION

## Product Description

The HPA-4 Plus with talkback/cue, powers up to four sets of headphones. Each output is supplied with a hefty stereo amplifier and may be configured to accept talkback/cue audio on the left headphone with a simple contact closure to ground. Front and rear panel T/R/S jacks are provided with each output, along with front panel level controls and monaural switch. The stereo balanced input is adjustable with the front panel master level control, while the balanced monaural talkback input is equipped with a rear panel trimmer. Additional features include; power, talkback/cue active and program audio activity front panel LED indicators, surge protected internal bi-polar 15-vdc-power supply affording superior headroom and high definition audio and is equipped with two power jacks allowing one wall transformer to power two units. The half rack profile, allows the unit to be set on a desktop, mounted on a wall or as part of the new RA-1, Rack-Able mounting shelf.

The optional **HR-1** may be purchased separately to provide 1/8" and 1/4" remote headphone jacks with level control, momentary push button and on-air led. The HR-1 may be desktop mounted, under counter or with the optional HR-1/MP mounting plate, may be turret mounted. Two rear panel 1/4" jacks are provided allowing the daisy chaining of units.

## WEBSITE:

*Visit our web site for product updates and additional information.*



## DESCRIPTION

## Installation

Please examine your HPA-4 Plus carefully for any damage that may have been sustained during shipping. If any is noted, please notify the shipper immediately and retain the packaging for inspection by the shipper. The package contains the HPA-4 Plus, 16Vac @ 600ma wall transformer, daisy-chain power cable and this manual.

Installation of the HPA-4 Plus in **high RF environments** should be performed with care. Shielded cable is suggested for all audio input connections. All shields should be tied to the “C-GND” Chassis **GrouND** terminals. The station ground should be connected to the chassis ground screw located on the far right side of the HPA-4 Plus as viewed from the rear. It is recommended that all input cables connected to the HPA-4 Plus should be looped through ferrite cores to suppress RF.

The HPA-4 Plus is equipped with two inputs, stereo program and monaural talkback/cue. Connections are via plug-in euroblock connectors. To install, remove the plug, strip 1/8” of insulation from the wire. Insert the wire in to the desired terminal and tighten the setscrew. When finished, reinsert the plug into the appropriate connector.

**Stereo Program Input:** Connect the left program source to the left input terminal labeled **L- / L+** and the right channel to the **R- / R+** terminals. Input levels should be in the range of -15 to +4dBu. Unbalanced inputs should have the - and **CG** terminals connected together.

**Monaural Talkback/Cue Input:** Connect the monaural talkback/cue program source to the talkback/cue input terminals labeled **CUE- / CUE+**. Input levels should be in the range of -15 to +4dBu. Unbalanced inputs should have the - and CG terminals connected together. Each headphone amp may be configured to accept talkback/cue audio in the left ear when the talkback/cue remote control is energized. **Follow the steps below to enable the talkback/cue function:**

- 1 - Remove the HPA-4 Plus cover.
- 2 - Locate jumper JP2 (Channel 1), JP3 (Channel 2), JP4 (Channel 3) and JP5 (Channel 4).
- 3 - Factory default jumper setting: All four jumpers are in the “**NO CUE**” position
- 4 - Determine what channel(s) to be configured for talkback/cue and move that jumper to the “**CUE**” position.
- 5 - Reinstall the cover when finished.

**Talkback/Cue Remote Control:** The talkback/cue function may be activated with either a (dry) contact closure to ground or a (wet) DC voltage between 5 and 24 volts. The HPA-4 Plus is factory configured for a (dry) contact closure to ground. To activate the talkback/cue, place a contact closure across the “**DG** (ground) and “**CAT**” (opto-isolators cathode) terminals. To configure this control input for “**DC**” (wet) operation, remove the HPA-4 Plus’s cover and locate jumper JP1. Move the jumper from the “**INT**” position to the “**EXT**” position. To activate the talkback/cue remote, simply apply a DC voltage from 5 to 24 volts between the “**CAT**” (negative, opto-isolators cathode) and “**AND**”(positive, opto-isolator anode) terminals. Observe the correct polarity. Reinstall the cover when finished.

**Headphone Jacks:** The HPA-4 Plus is equipped with four sets of 1/4” T/R/S front and rear panel jacks. Only use stereo headphones with impedances between 24 and 600 ohms. **8 ohm and/or monaural headphones should not be used with the HPA-4 Plus or HR-1.**



### NOTE:

*Some features may require the removing of the chassis cover. Caution should be observed, as hazardous voltages may be present on the printed circuit board. Be sure to reinstall the cover before operating the HPA-4 Plus.*

## Operation

**Program level setup:** Feed normal headphone program audio into the HPA-4 Plus. Set the “INPUT” level control until the front panel “ACT” led is activated, then turn the input control another 1/4 turn clockwise. Adjust each headphone channel to a comfortable level.

**NOTE: Excessive listening levels may cause hearing damage!**

**Talkback/Cue level setup:** Feed talkback/cue audio into the HPA-4 Plus. Plug a set of headphones into the channel that talkback/cue has been enabled. Insure that the channels level control has been set to the normal program listening level (the front panel “INPUT” control doesn’t effect the talkback/cue level). Place a contact closure across the “DG” & “CAT” terminals. The front panel “Talkback/Cue” led should light. Adjust the rear panel “CUE” trimmer to a comfortable level.

**NOTE: Excessive listening levels may cause hearing damage!**

**Monaural Switch:** Engage this switch to force your stereo program to monaural. The “Mono” indicator will illuminated when in monaural.

### WEBSITE:

*Visit our web site for product updates and additional information.*



## Specifications

Input Level:	+4dBu nominal.
Input Impedance:	20K ohms balanced, 10 K unbalanced.
Frequency Response:	20Hz – 20 kHz, +/- .25dB
Distortion:	.004% nominal
Noise:	-82dB.
Output Level:	Depends on the headphone impedance.
Output Impedance:	10 ohms, unbalanced. 24 to 600 ohm headphones.
Talkback/Cue Control:	Contact closure to ground or DC voltage between 5 & 24 volts
Connectors:	1/4" T/R/S jacks and plug-in euroblock connectors.
Power:	16 Vac @ 600ma. 120 Vac 50-60 hz transformer, supplied. Two HPA-4 Plus's may be powered by one transformer. (CE 240 Vac 50-60 Hz optional)
Size:	1/2 rack space, 8.50" x 6.50" x 1.55" (WDH), painted chassis with 4 – 6-32 mounting holes.
Weight:	2.0 lb.
Options:	RA-1, Rack Shelf. 1 RU (holds two HPA-4 Plus's). HR-1, Remote Enclosure HR-1/MP, Mounting Plate NR-1/MP-XLR, mounting plate with female XLR hole

### WEBSITE:

*Visit our web site for product updates and additional information.*



### SPECIFICATIONS

### LIMITED WARRANTY

The term "Buyer" as used in this document refers to and includes both (but only) (a) any person or entity who acquires such an item for the purpose of resale to others (i.e., a dealer or distributor of an item), and (b) the first person or entity who acquires such an item for such person's or entity's own use.

Broadcast Tools warrants to each Buyer of any item manufactured by Broadcast Tools that the item will be free from defects in materials and workmanship at the time it is shipped by Broadcast Tools if the item is properly installed, used and maintained.

### EXCLUSIVE REMEDIES

If Broadcast Tools is notified, in writing, of a failure of any item manufactured by Broadcast Tools to conform to the foregoing Limited Warranty within one (1) year following the date of the Buyer's acquisition of the item, and if the item is returned to Broadcast Tools in accordance with Broadcast Tools' instructions for confirmation by inspection of the defect (which at Broadcast Tools' election may include, without limitation, a requirement that the Buyer first obtain a Return Authorization number from Broadcast Tools, that the Buyer furnish proof of purchase in the form of an invoice and/or receipt, and that the Buyer prepay all freight charges associated with any return of the item to Broadcast Tools using such freight service as Broadcast Tools reasonably may specify), Broadcast Tools will repair or replace the defective item, or will refund the purchase price paid by the Buyer for the item. Broadcast Tools shall have the exclusive right to choose between these alternative remedies.

### NO OTHER WARRANTIES OR REMEDIES

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, BROADCAST TOOLS AND ITS SUPPLIERS DISCLAIM ALL OTHER WARRANTIES, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE; AND THE FOREGOING ALTERNATIVE REMEDIES SHALL BE EXCLUSIVE OF ALL OTHER REMEDIES. THIS LIMITED WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU MAY HAVE OTHER RIGHTS, WHICH VARY FROM STATE/JURISDICTION TO STATE/JURISDICTION.

### NO LIABILITY FOR CONSEQUENTIAL DAMAGES

TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, NEITHER BROADCAST TOOLS NOR ANY OF ITS SUPPLIERS SHALL HAVE ANY LIABILITY FOR ANY SPECIAL, INCIDENTAL, INDIRECT, CONSEQUENTIAL OR PUNITIVE DAMAGES WHATSOEVER (INCLUDING, WITHOUT LIMITATION, ANY DAMAGES FOR LOST PROFITS, BUSINESS INTERRUPTION, LOSS OF DATA OR INFORMATION, COST OF CAPITAL, CLAIMS OF CUSTOMERS, OR ANY OTHER PECUNIARY LOSS) ARISING OUT OF THE USE OF OR THE INABILITY TO USE ANY ITEM SUPPLIED BY BROADCAST TOOLS, EVEN IF BROADCAST TOOLS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES HAVE ANY LIABILITY FOR ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY OR PUNITIVE DAMAGES. THIS LIMITATION OF LIABILITY APPLIES WHETHER A CLAIM IS ONE ALLEGING BREACH OF A CONTRACT OR WARRANTY, NEGLIGENCE OR OTHER TORT, FOR THE VIOLATION OF ANY STATUTORY DUTY, THE FAILURE OF ANY LIMITED OR EXCLUSIVE REMEDY TO ACHIEVE ITS ESSENTIAL PURPOSE, OR ANY OTHER CLAIM OF ANY NATURE. BECAUSE SOME STATES AND JURISDICTIONS DO NOT ALLOW THE EXCLUSION OR LIMITATION OF LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, THIS LIMITATION MAY NOT APPLY TO YOU.

#### **Broadcast Tools, Inc.**

131 State Street

Sedro-Woolley, WA 98284 • USA

360.854.9559 **voice** • 866.783.1742 **fax**

support@broadcasttools.com **e-mail**

www.broadcasttools.com **website**