



hear
TECHNOLOGIES™

hear back
Personal Monitor Mixer System™

user guide



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HEAR BACK SYSTEM DESCRIPTION

The basic Hear Back™ system consists of a hub and personal mixers. The hub receives any of the three input signals and converts them to HearBus digital audio plus power. The mixers are connected to the hub using CAT5E cable.

A single hub supplies digital audio and power to a maximum of eight mixers. That's one for you and everybody in the band! If that's not enough, the hubs can be daisy-chained using the HearBus In and HearBus Out for virtually unlimited system size.

The hub may be connected to recording equipment, digital audio workstations, and analog or digital consoles.

The mixer is placed near the talent and gives them control over the audio inputs. The user-friendly system saves system setup time.

ADVANTAGES / FEATURES

- Virtually unlimited system size
- Excellent quality and audio fidelity
- High power - low distortion headphone amplifiers
- Very long interconnect without loss of audio quality
- Three audio inputs: ADAT® optical, analog, and HearBus are switch selectable from the front panel
- Local control of up to ten channels of audio - 8 inputs plus a stereo Aux input
- Built-In DSP limiter for hearing and monitoring device protection
- Headphone amplifier fault LED
- Bus status indicator
- Link indicators/switches - links mono pairs for stereo operation
- Standard CAT5E cable for power and signal connection to mixers
- Built-in cable strain relief
- Balanced line outputs - mono/stereo
- Stereo AUX in
- Built-In mic stand mount as well as desktop mount capability

FCC Statement

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



HUB FEATURES

- Three switch selectable 8-channel input sources: ADAT Optical, Analog, HearBus
- 24-bit A/D converters
- Digital input sample rates: 44.1 KHz or 48 KHz
- Less than 1.5 milliseconds total system delay (latency)
- 3-LED four-level metering
- Standard CAT5E - delivers power and signals to mixers
- Daisy-chain for very large systems
- Internal, internationally approved universal power supply
- Quiet, temperature controlled fan (only runs when power supply temperature reaches 60° C or 140° F)
- 1 RU chassis

HUB INPUTS

1. ADAT®

The ADAT input **5** can be connected to digital audio workstations, digital recorders, or digital mixers using a standard TOS-Link optical cable. For front of house or remotely located digital mixers, use a Hear Technologies Extreme Extender ADAT IN* that converts ADAT optical, which is limited in distance, to the HearBus for transmission of up to 500 feet. Use Hear Technologies Optical cables available in 6, 12, and 25 foot lengths.

*ADAT Extreme Extenders In/Out are available for converting from ADAT to Optical to HearBus and from HearBus to ADAT Optical.

2. HearBus™

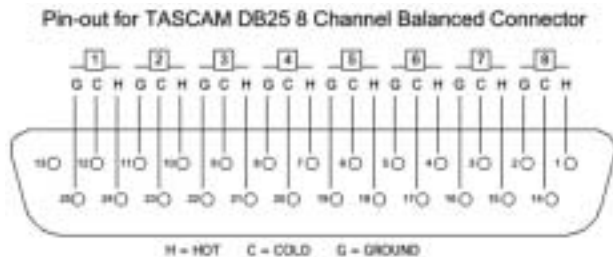
The HearBus permits daisy-chaining of multiple hubs up to 500 feet apart using the HearBus input **6** and HearBus output **7**. This HearBus is great for inter-studio or stage-to-stage connections, as well as daisy-chaining for very large systems. Use Hear Technologies CAT5E cables, which are available in 2, 12, 25, 50 and 100 foot lengths.

3. Analog

Analog inputs **9** are fully balanced and are connected using a standard TASCAM DA-88 style Analog cable, such as the Hear Back Analog cable.

DB25 cable pin-outs are wired as shown below:

⚠ CAUTION: Use only DA-88 Analog. Do not use TDIF.



INPUT SELECTOR SWITCH - The input selector switch **2** gives the user a simple way to select any one of the three input sources without a patch bay, router or rewiring.

HUB OUTPUTS - The hub has mixer outputs **8** which each deliver digital audio, ground and +/- 18VDC. Each of the eight hub outputs must be home run to a mixer, with a maximum distance of 200 feet. Outputs not in use should be disconnected at the hub.

MIXER RJ45 PINOUTS

Pin	Function	Pin	Function
1	Digital Audio +	5	-18VDC
2	Digital Audio -	6	Ground
3	Ground	7	+18VDC
4	+18VDC	8	-18VDC

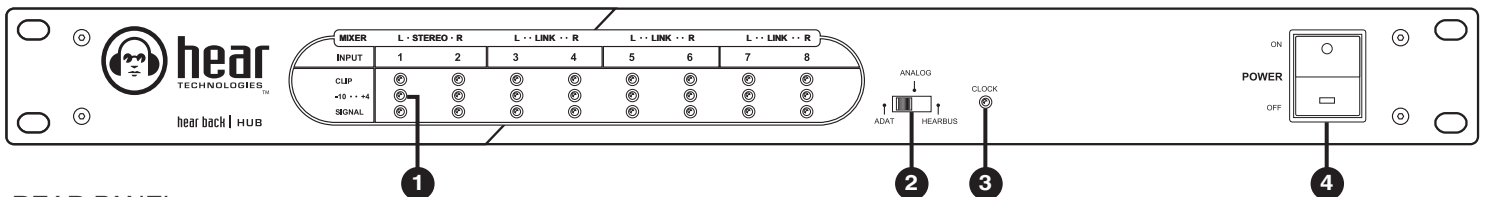
Each of the eight hub mixer outputs has a solid-state automatically resettable fuse in-line with the power supply outputs to prevent power supply damage. In the event of a shorted cable or broken mixer, the PTC fuses go to high impedance permitting other mixers to function while protecting the power supply from the faulty output.

The main AC input is connected using a standard IEC320 cable. The universal power supply is designed to operate from 90 to 264VAC at 50 to 60Hz. The AC input circuit is internally fused. A front panel power switch **3** is provided for convenience.

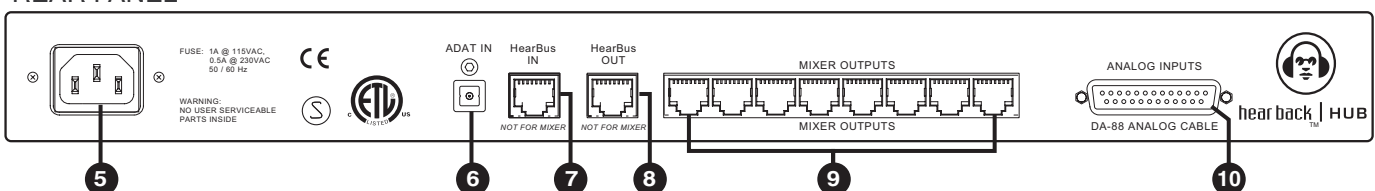
INPUT METERING - The hub features a unique input metering circuit consisting of three LED's for each of the eight input, while providing four visual levels. The middle blue LED's operate at two different brightness levels. The green LED indicates -32 dBu signal presence, the blue at -10 dBu (dim) and +4 dBu (bright) and the red clip LED operate at +16 dBu.

INTERNAL FAN - The internal temperature-controlled fan operates whenever the power supply temperature reaches 60° C or 140° F. In studio or indoor use, the fan should rarely come on. The hub should be rack mounted away from high temperature devices such as power amplifiers.

FRONT PANEL



REAR PANEL



- | | | |
|---|-----------------------------|----------------------------------|
| 1 Four-Level, 3-LED Input Metering | 5 AC Power Entry | 8 HearBus Output |
| 2 Input Selector Switch | 6 ADAT Optical Input | 9 Hear Back Mixer Outputs |
| 3 HearBus Clock Status Indicator | 7 HearBus Input | 10 Analog Inputs |
| 4 AC Power Switch | | |

MIXER FEATURES

- Local control of up to ten channels of audio
- Master volume
- Built-in DSP limiter
- 24-bit D/A converters
- Less than 1.5 millisecond total system delay
- Bus status indicator

- Headphone amplifier fault indicator
- Link indicators
- Standard CAT5E power and signal connection
- Balanced, mono/stereo, line outputs
- +4 dBu level TRS unbalanced stereo AUX in:
 - Expand numbers of mixes
 - Drum module/metronome or local mix input

MIXER CONSTRUCTION

The Hear Back mixer is constructed of UV-stabilized ABS and has a built-in mic stand mount. Two cable strain reliefs greatly reduce stress on the CAT5E cable connectors and the mixer RJ45 connector.

STATUS INDICATORS

The mixer has three types of status indicators:

1. **BUS** - The bus indicator **1** is a bi-color LED that is green under normal operating conditions, indicating the HearBus clock is present. In the absence of the clock, the indicator turns red alerting the user a problem exists at the hub or connection to the hub.
2. **LINK** - The link indicators **2**, **14** and **16** illuminate whenever the associated link switch(es) **4**, **6** and **8** are pressed. Switch settings are stored in non-volatile flash memory whenever power is removed.

3. **HEADPHONE AMPLIFIER FAULT** - The fault indicator **22** is normal off and only illuminates red if an over-current or short circuit condition occurs. The circuit shuts down the headphone amplifier and upon cooling returns to normal operation. *Continued cycling of the fault circuit is not recommended as excessive cycling can degrade the amplifier's performance and life.*

LINK OPERATION

Normally, a stereo mix is connected to the hub channels 1 and 2. These are typically the front of house or control room mix and are controlled using the mixer stereo input knob **9**.

The "more me" inputs are typically mono and are controlled using the mono control knobs **3**, **13**, **5**, **15**, **7** and **17**. The mono signals are center-panned in the stereo field when the link indicator is off.

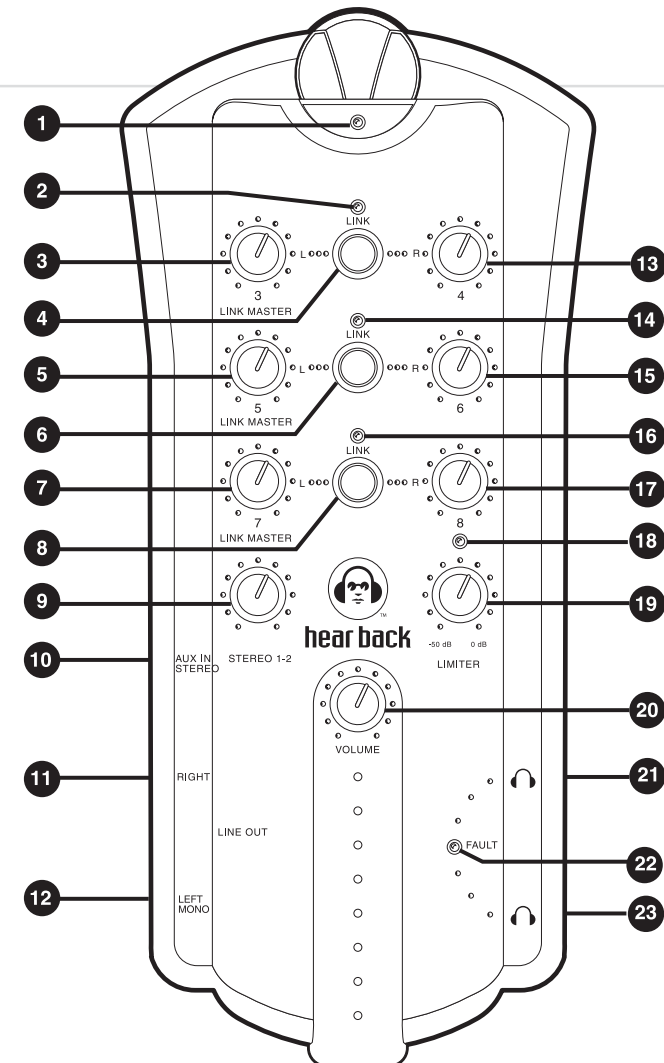
When a pair of mono inputs are linked, three things occur;

1. The left channel becomes the link master volume control for the stereo pair.
2. The two inputs are hard panned left and right. Inputs can be adjusted at the source to have a stereo spread anywhere desired. Stereo signals are realized by using a pair of the mono inputs: 2/4, 5/6, and/or 7/8 by simply pushing the link switch **4**, **6**, or **8**.
3. The right mono volume now becomes inactive.

LIMITER

The limiter gives the user ultimate control of his/her hearing protection as well as headphones, in-ear and conventional loudspeaker monitoring devices in the event of excessive input levels. The two-stage DSP limiter is an $\infty:1$ or "brick wall" limiter. The limiter is controlled using simple threshold adjustment **19**.

The limiter active blue LED **18** illuminates when the limiter is active. If the indicator operates during normal program material the dynamic range and quality of sound will suffer. **NOTE: Limiter should only be active when excessive signals are present.** To set the limiter, see **Hear Back Connecting and Calibration** on page 6.



- | | |
|--|---|
| 1 Bi-Color Bus Status Indicator | 12 Left/Mono Line Output |
| 2 Link Indicator - Channels 3/4 | 13 Mono Channel 4 |
| 3 Mono Channel 3/Stereo Link Master Level | 14 Link Indicator - Channels 5/6 |
| 4 Link Switch - Links Channels 3/4 | 15 Mono Channel 6 |
| 5 Mono Channel 5/Stereo Link Master | 16 Link Indicator - Channels 7/8 |
| 6 Link Switch - Links Channels 5/6 | 17 Mono Channel 8 |
| 7 Mono Channel 7/Stereo Link Master | 18 Limiter Indicator |
| 8 Link Switch - Links Channels 7/8 | 19 Limiter Threshold Control |
| 9 Stereo Mix Level Control, Channels 1/2 | 20 Master Volume |
| 10 Stereo Auxiliary Input | 21 Headphone Output |
| 11 Right Line Output | 22 Headphone Amplifier Fault Indicator |
| | 23 Headphone Output |

LINE OUTPUTS

Two balanced ¼ inch Tip, Ring, and Sleeve line outputs are provided - 11 and 12. The left operates as a mono output for sub woofers and mono devices if nothing is plugged into the right line output. When a ¼ inch plug is inserted into the right output the line outputs operate in normal stereo mode. The line outputs may be used simultaneously with the headphone outputs and are both controlled with the master volume knob 20. In the event of ground loops when connecting the mixer line outputs to other devices that have an earth ground, it may become necessary to lift the shield at the mixer outputs. NEVER lift or disconnect the AC safety ground of any device.

AUX IN

The auxiliary input 10 is a 1/8 inch Tip, Ring, and Sleeve input optimized for +4 dBu input levels. These signals are summed into the analog section of the mixer just upstream of the master volume 20. The input permits another stereo mix to be inserted into the mixer. Examples of use would be a drum machine click track into the drummers mixer. Another application would be a stereo mix from a guitar or keyboard local mix, another Hear Back Mixer, creating a total of ten channels controlled from your mixer.

MASTER VOLUME

The master volume 20 is used to set the volume of the headphones and the line outputs. When using the line outputs in conjunction with the headphones, optimize the mix for the headphones and then adjust the device connected to the line outputs to balance the gain. Follow the same procedure if using the AUX input; once the desired mix is obtained, adjust the source to get the desired level at the AUX input.

HEADPHONE AMPLIFIER

The headphone amplifier outputs 21 and 23 are paralleled outputs. When using multiple headsets, the total impedance should not go below 16 ohms. The headphone amplifiers are very powerful and can easily damage in-ear transducers, headphones, and your hearing; exercise great care in adjusting the master volume. At 50 ohms the amplifier is capable of sustaining 2 watts of power! The amplifiers are short circuit protected and have a fault indicator 22.

HEAR BACK CONNECTING AND CALIBRATION

1. Connect the appropriate input(s), as shown in the hook-up diagrams beginning on page 10, and select the desired input using the front panel switch. Connect mixers to the hub outputs using CAT5E cables and set all mixer controls to off (full counter-clockwise position, except the limiter which should be fully clockwise), connect the headphones, in-ear monitors, and/or line outputs for connecting to wireless in-ear systems, powered monitors, or other devices requiring line-level inputs.
2. Turn on hub power.
3. Adjust the level at the input source (DAW, Mixer, etc.) until the clip LED's on the hub just come on and then reduce the input(s) until you have a bright blue LED. NOTE: Adjust the source for as much signal into the hub as possible without clipping. Higher input levels improve signal-to-noise and dynamic range.
4. Mixer Adjustment: Once you have the signals optimized, turn the master volume to about 10 o'clock and then raise the stereo mix to a comfortable level normally around 10 o'clock. Adjust the "more me" mono/stereo inputs 3-8 to the desired levels. Avoid adjusting the Master Volume too high and running the inputs too low.
5. Limiter Adjustment: Once a mix is established, turn the limiter threshold knob counter-clockwise until the blue LED just comes on, then turn clockwise until the LED goes off. This sets the limiter to protect your hearing and monitoring device in the event an input goes above normal levels. The limiter should only come on when this condition occurs. Causing the limiter to operate (blue LED on) during normal operation will cause a loss of dynamic range and will add distortion to the signals being monitored. Remember, it is for excessive signals only.

NOTE: The HearBus and mixer outputs contain high speed digital audio and should be treated as a transmission line. Do not "Y" these connections because the terminated controlled impedance will be comprised. The HearBus and mixer outputs operate at 12.28 MHz.

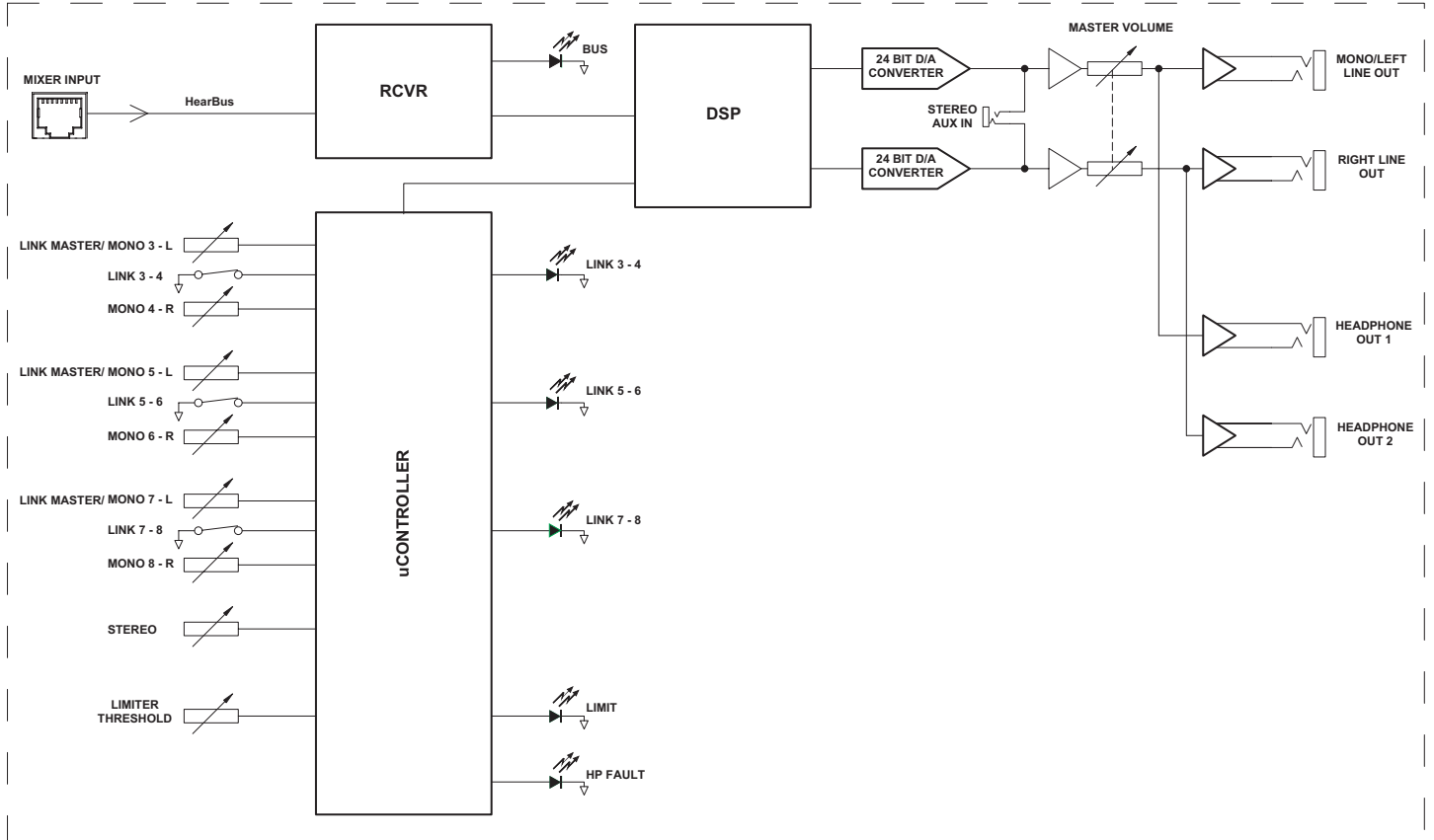
Now enjoy personal monitoring at its best and have fun!

WARNING

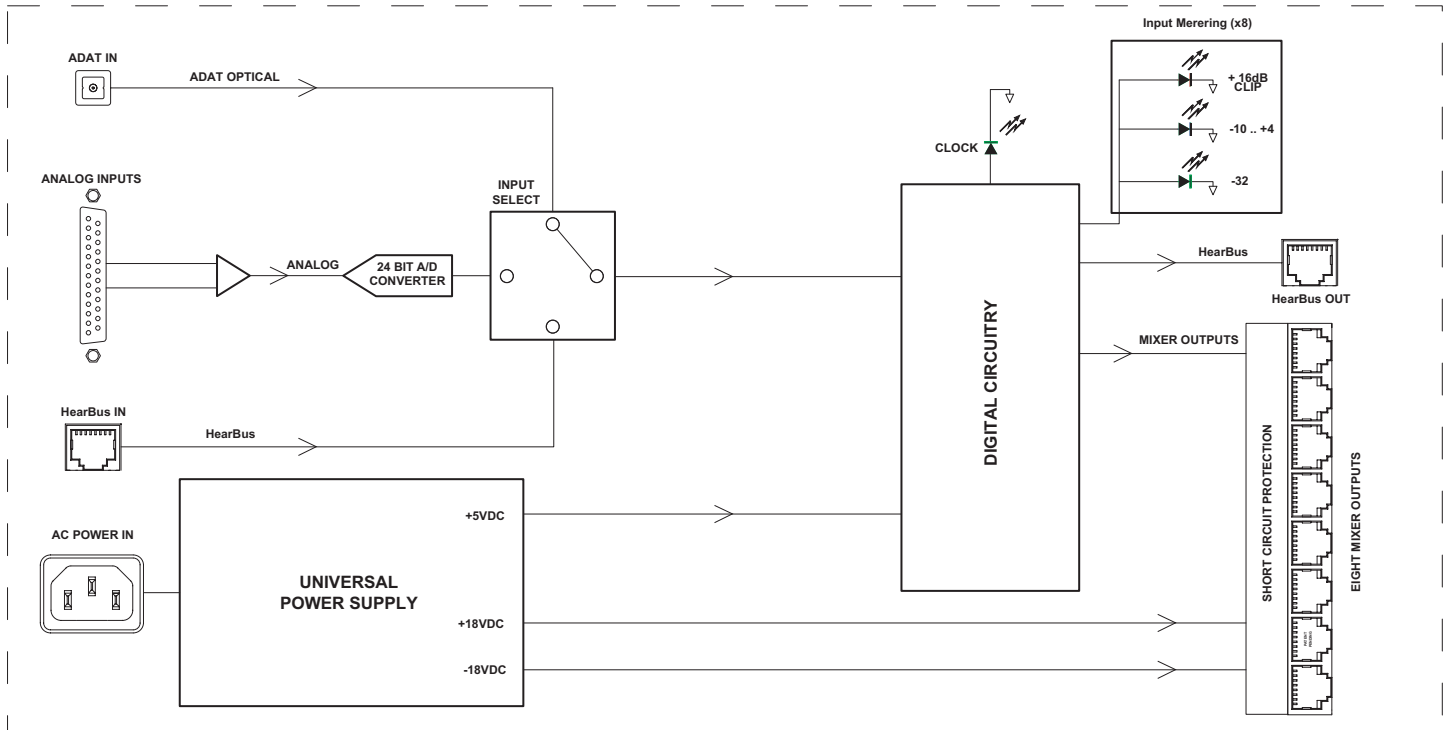
- The Hear Back Mixer is capable of driving most headphones to extreme levels that can damage your HEARING!
- ALWAYS turn down the mixer "Master Volume" down before putting on in-ear headsets or headphones.
- The mixer Limiter is pre-master volume and protects from excessive input signals. It is the user's responsibility to prevent hearing damage by virtue of excessive headphone "Master Volume" settings.

SYSTEM BLOCK DIAGRAM

HEAR BACK MIXER



HEAR BACK HUB



SYSTEM SPECIFICATIONS

Aux Input		
Input Configuration/Impedance:	Stereo, unbalanced, 10 Kohms typical	
Input Level:	+4 dBu optimal, +22 dBu max	
Head Phone Power		
Load Impedance:	THD less than 0.01%*	THD less than 0.1%
8 Ohms:	150 mW* <i>*THD AT 8 Ohms = 0.015% typical</i>	230 mW
16 Ohms:	235 mW	500 mW
25 Ohms:	675 mW	775 mW
32 Ohms:	950 mW	1.1 W
50 Ohms:	1.6 W	1.8 W
100 Ohms:	1.14 W	1.25 W
200 Ohms:	500 mW	650 mW
600 Ohms:	215 mW	220 mW
Inter Modulation Distortion:	Typically less than 0.03%	
Line Out		
Freq Response:	20 Hz to 20 KHz, +0.04 dB, -0.55 dB	
THD+N:	0.008% typical at 1 KHz, +15 dBu, 0.02% typical, 20 Hz – 20 KHz, +4 dBu	
Inter Modulation Distortion:	0.02% typical at +4 dBu, 60 Hz/7 KHz	
Crosstalk:	Better than -85 dB @ 1 KHz	
Propagation Delay:	Less than 1.5 mSec	
Noise Performance		
Noise, A-Weighted:	-91 dBu analog, -97 dBu optical	
Dynamic Range:	112 dB typical	
System I/O		
Hub Line In, Analog:	8 Balanced inputs on DB-25 female (Tascam DA-88 pinout)	
Maximum Input Level, Analog:	+15 dBu	
Hub Light Pipe In:	Industry standard fiber optic connector, shuttered	
Hub HearBus In, Out:	8-pin RJ45 jack (2 each)	
Mixer Headphone Out:	TRS 1/4" unbalanced stereo (2 each)	
Mixer Line Out:	TRS 1/4" balanced (2 each)	
Maximum Output Level, Analog:	+24 dBu (mixed output)	
Aux Input:	TRS 1/8" unbalanced stereo	
Physical, Mixer		
Size:	11.5" (29.2 cm) H x 5.2" (13.2 cm) W x 3.6" (9.15 cm) D	
Unit Weight:	1.2 lb. (0.54 kg)	
Mounting:	Standard mic stand or desk mounted	
Physical, Hub		
Size:	1.75" H x 19" W x 7.125" D	
Unit Weight:	5.0 lb.	
Mounting:	Standard rack mount, 1 RU	
Power		
Requirements:	100-230VAC, 50/60HZ, 100 Watts	

Note: 0 dBu = 0.775 V rms

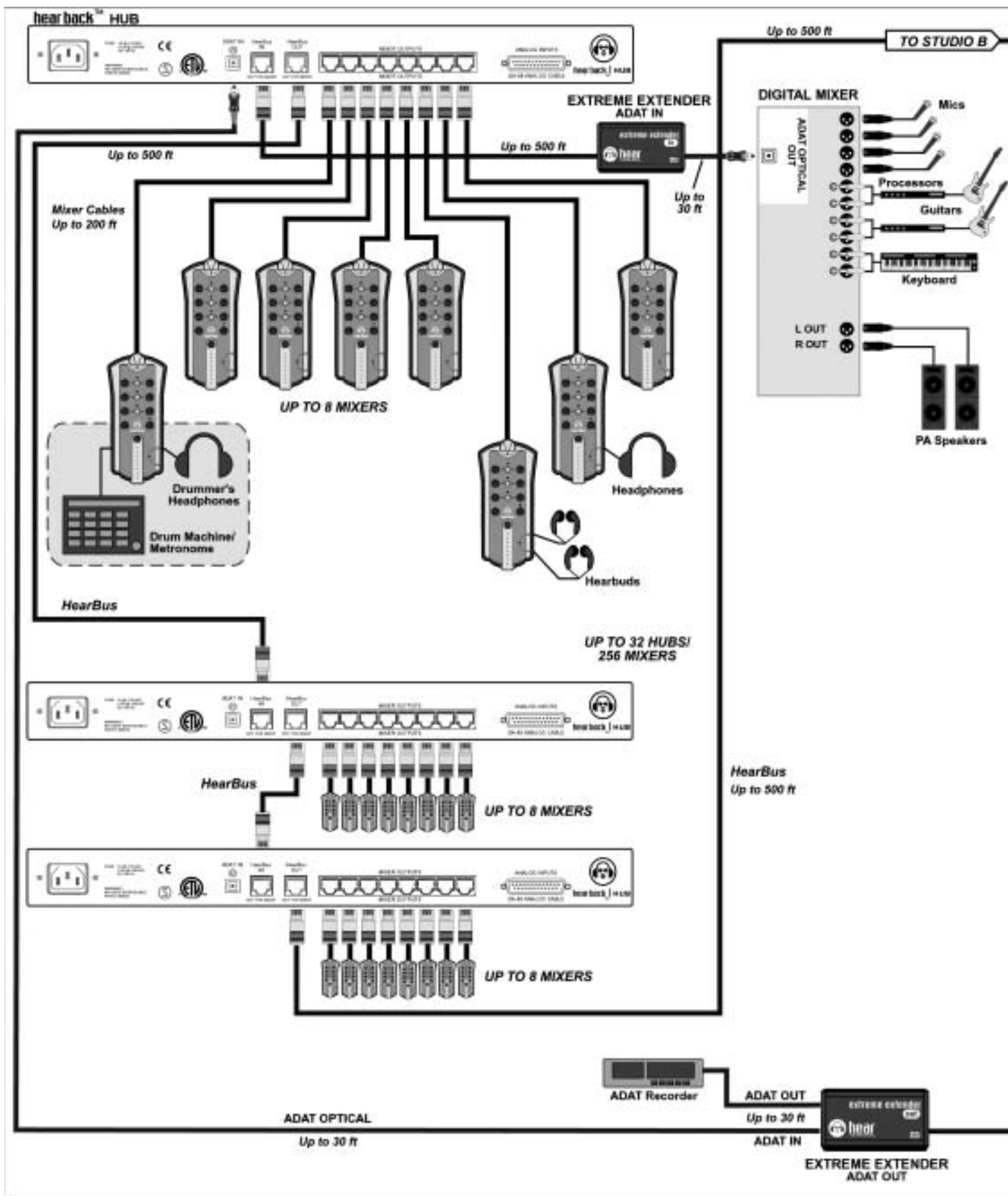
*Specifications and features subject to change without notice.

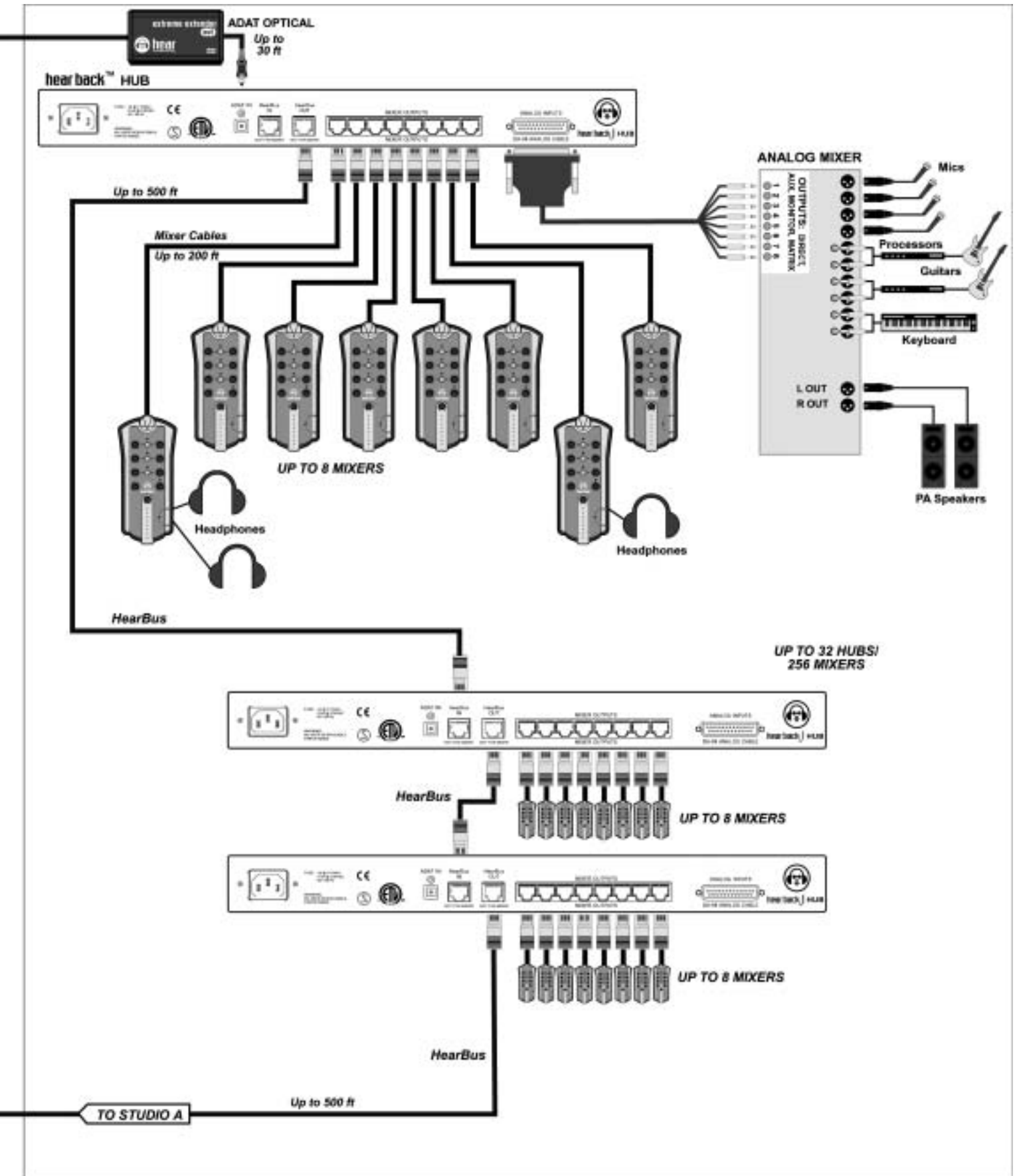
TROUBLESHOOTING AND OPERATING TIPS

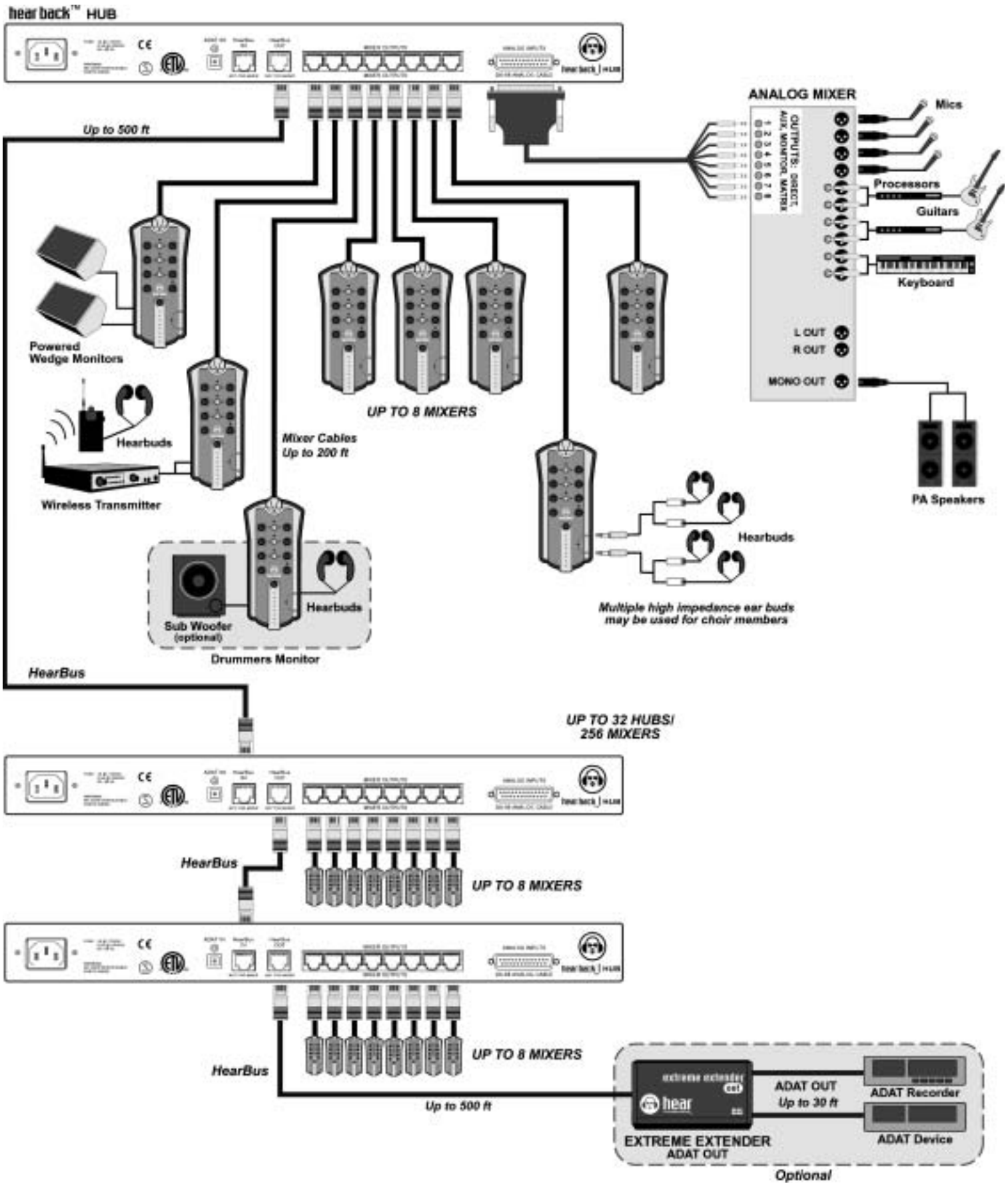
No Signal	<ul style="list-style-type: none">• Verify power is on.• Check input connections and input selector switch.• Verify the hub and mixers have green clock status indications.• Check output devices, headphones, wireless transmitter/receiver, monitor amplifiers, etc.
When I connect a line level device to the mixer line outputs, I hear a buzz.	<ul style="list-style-type: none">• Wire TRS outputs using only black (ring -) and red (tip +) wires.• Disconnect shield at the mixer and terminate at receiving end only.• For unbalanced outputs wire the Black (ring -) to the receiving end sleeve and tie the shield at the receiving end only. Connect the tip (+ red) to the tip at the receiving end.
Setting the limiter	<ul style="list-style-type: none">• Set the limiter so it only activates in the presence of an excessive input signal. The limiter should only be active in the event of excessive signals and should NOT be on when normal signals are present.
I have a clock signal at the hub, but nothing at the mixer.	<ul style="list-style-type: none">• Isolate the problem as follows:• Check CAT5E cable or try another cable.• Try another mixer output port on the hub.• Try another mixer.
When I link two mono channels, the stereo spread is incorrect.	<ul style="list-style-type: none">• Verify the source (mixer, DAW, etc.) has these outputs panned hard left and right. The pan control of the source determines the stereo spread.
The headphone amplifier fault indicator is on.	<ul style="list-style-type: none">• The fault indicator indicates either a short circuit or excessive load.
I need more mixes.	<ul style="list-style-type: none">• Connect the stereo mix (channels 1&2) with the FOH or control room mix across several hubs (as many as desired) then provide the "more me" sectional mixes to channel 3-8 on each hub until the desired number of mix's are met. See "Large Stereo System" hook-up diagram, page 15.
The fan does not operate.	<ul style="list-style-type: none">• The fan only runs when power supply temperature reaches 60° C or 140° F.
How to parallel channels 1 & 2 (stereo inputs) across multiple "Master Hubs" as shown in the "Large Stereo System" hook-up diagram on page 15	<ul style="list-style-type: none">• After connecting the stereo mix to channels 1 and 2 at each hub - Connect master hub #1, channels 3-8 for band mix, connect master hub #2, channels 9-14 for vocals section, connect master hub #3, channels 15-20 for horns ... you get the idea, right! By using the HearBus outputs on the master hubs and connecting them to the slave hub HearBus inputs, you can obtain as many mixing stations of each master mix as desired. Since each hub may be daisy chained a minimum of 32 times, this example system yields 3 master hubs x 32 slave hubs = 96 hubs, then 96 x 8 = 768 mixers! <p>NOTE: When "Y" connecting multiple hub inputs, one must be concerned with the total impedances. The hub inputs are 18K ohms balanced. Since the input to output impedance ratio should be at or above 10:1, there are a couple of rules to follow: Assuming a mixer source impedance of 180 ohms, the following applies: $18000/1800 = 10$.</p> <p>Where: 18000 = source impedance 1800 equals ten times your source impedance $10 = 18000/1800$ is the number of hubs that meet the required impedance</p> <p>Therefore, you can parallel up to ten master hubs to a quality BALANCED line output. In the event you experience problems or if you have an unbalanced output, obtain a high quality, balanced audio distribution system. We don't recommend using unbalanced sources for this connection scheme as hum loops will occur.</p>

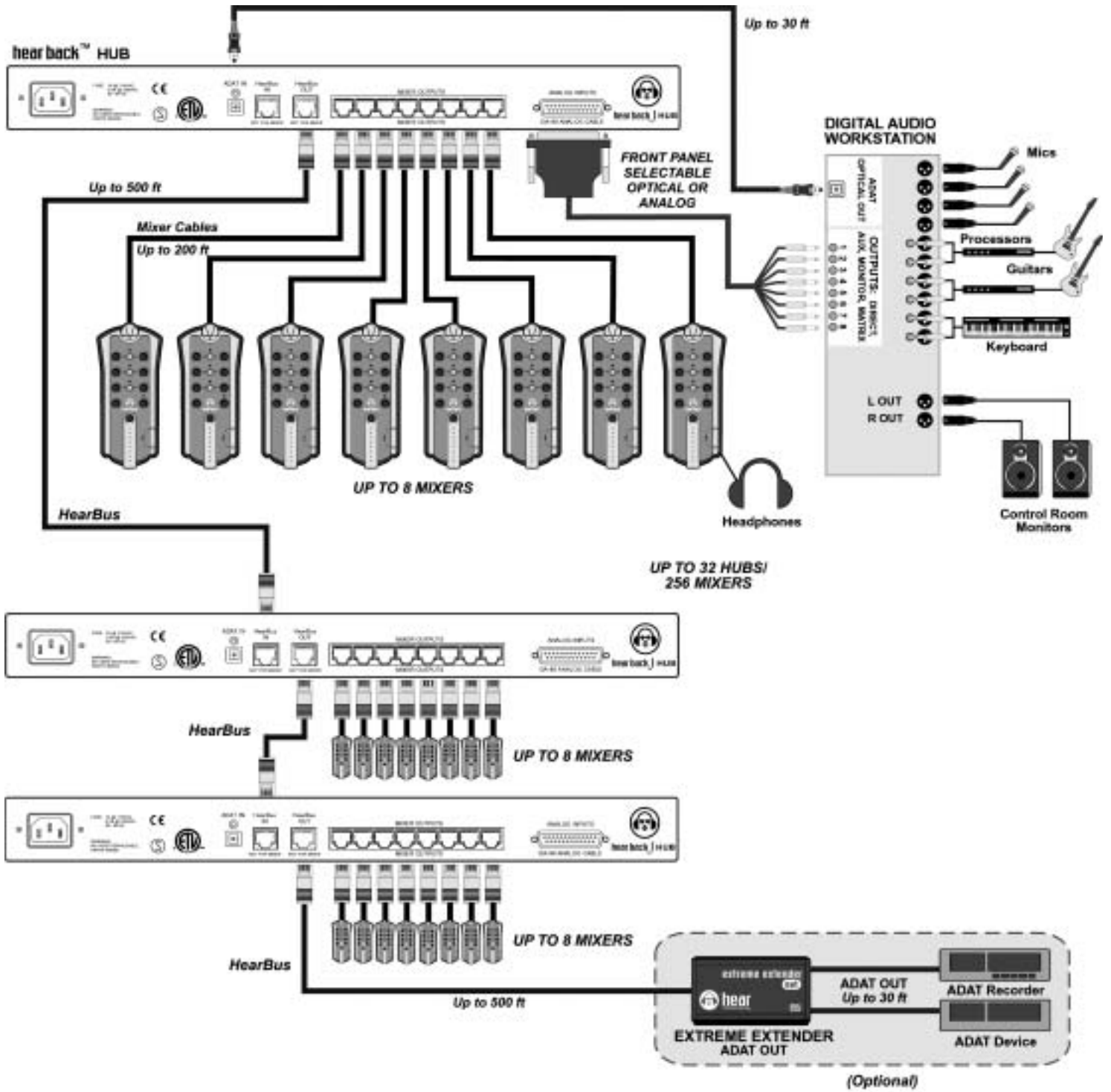
NOTE: The HearBus and mixer outputs contain high speed digital audio and should be treated as a transmission line. **DO NOT "Y"** these connections because the terminated controlled impedance will be comprised. The HearBus and mixer outputs operate at 12.28 MHz.

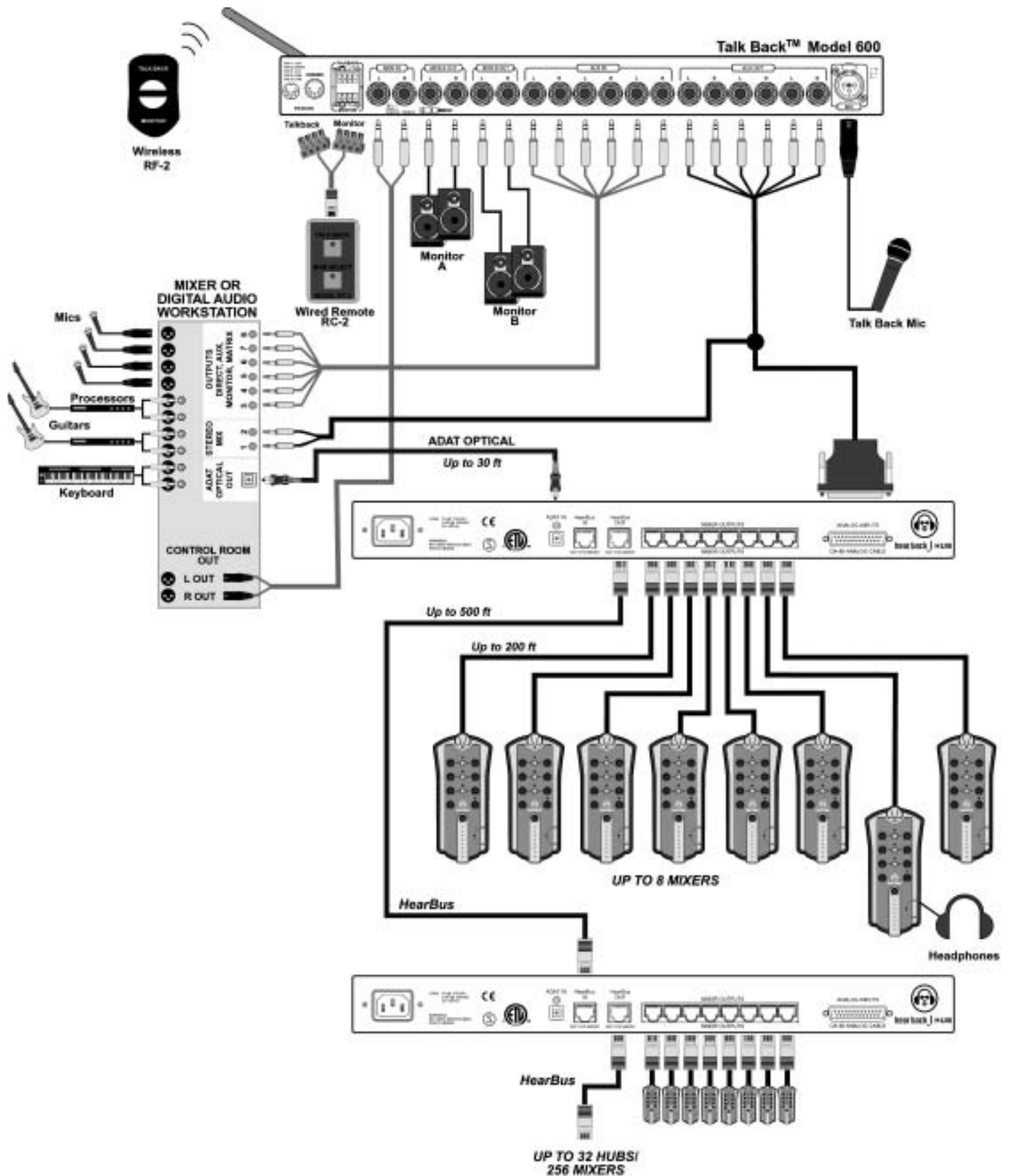
If you need further assistance, feel free to contact **Hear Technologies** technical support at 1-256-922-1200.

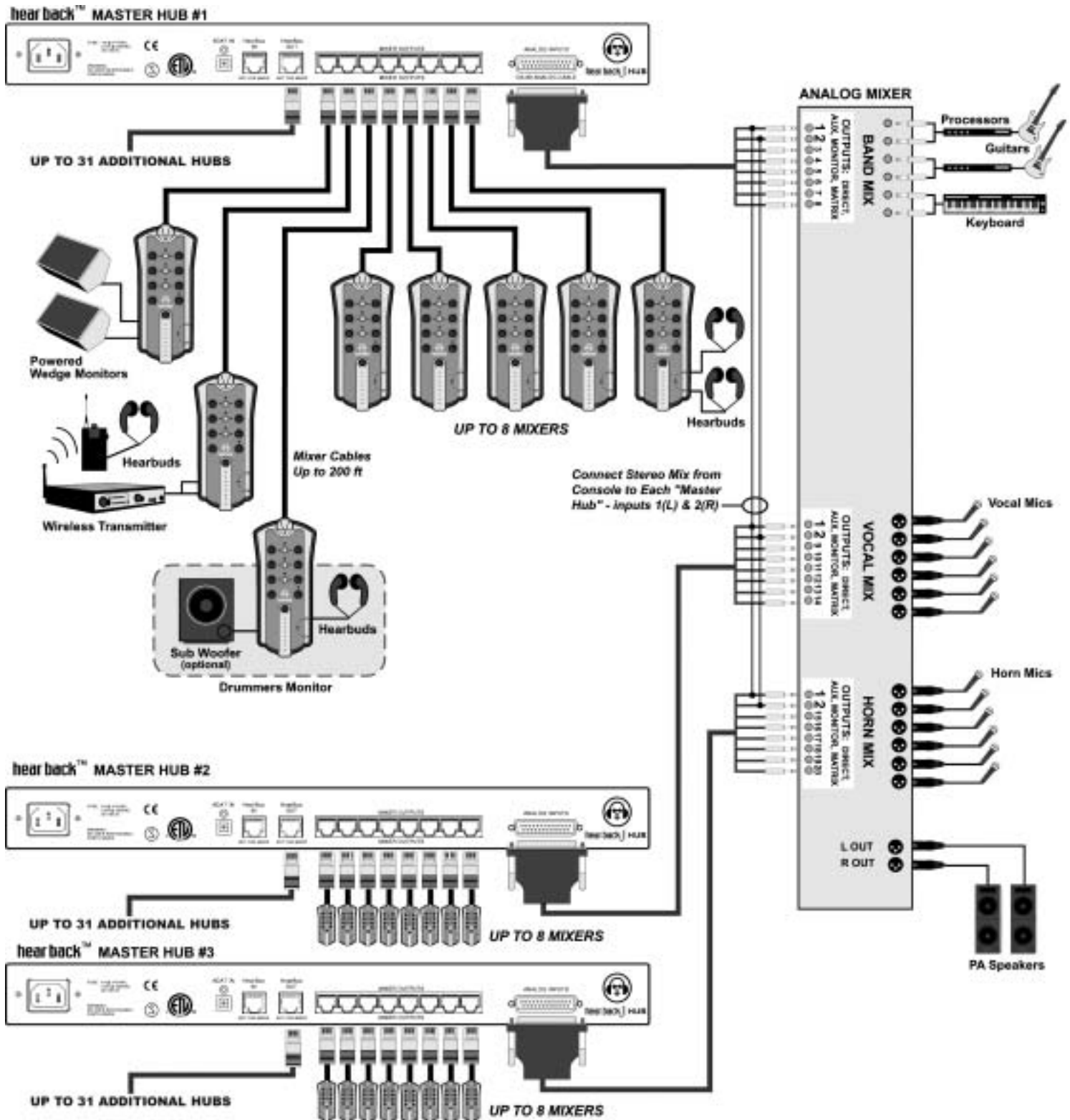




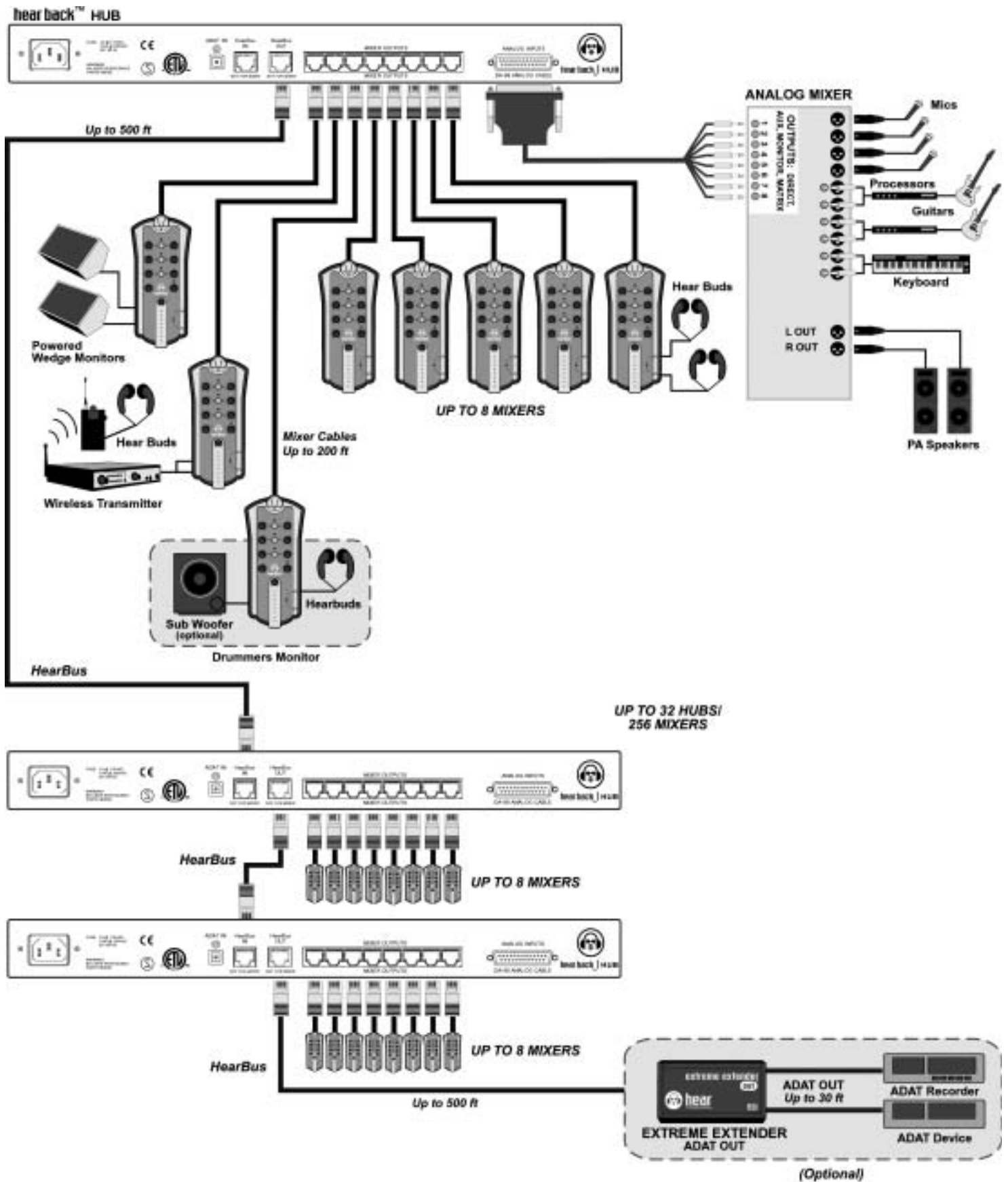


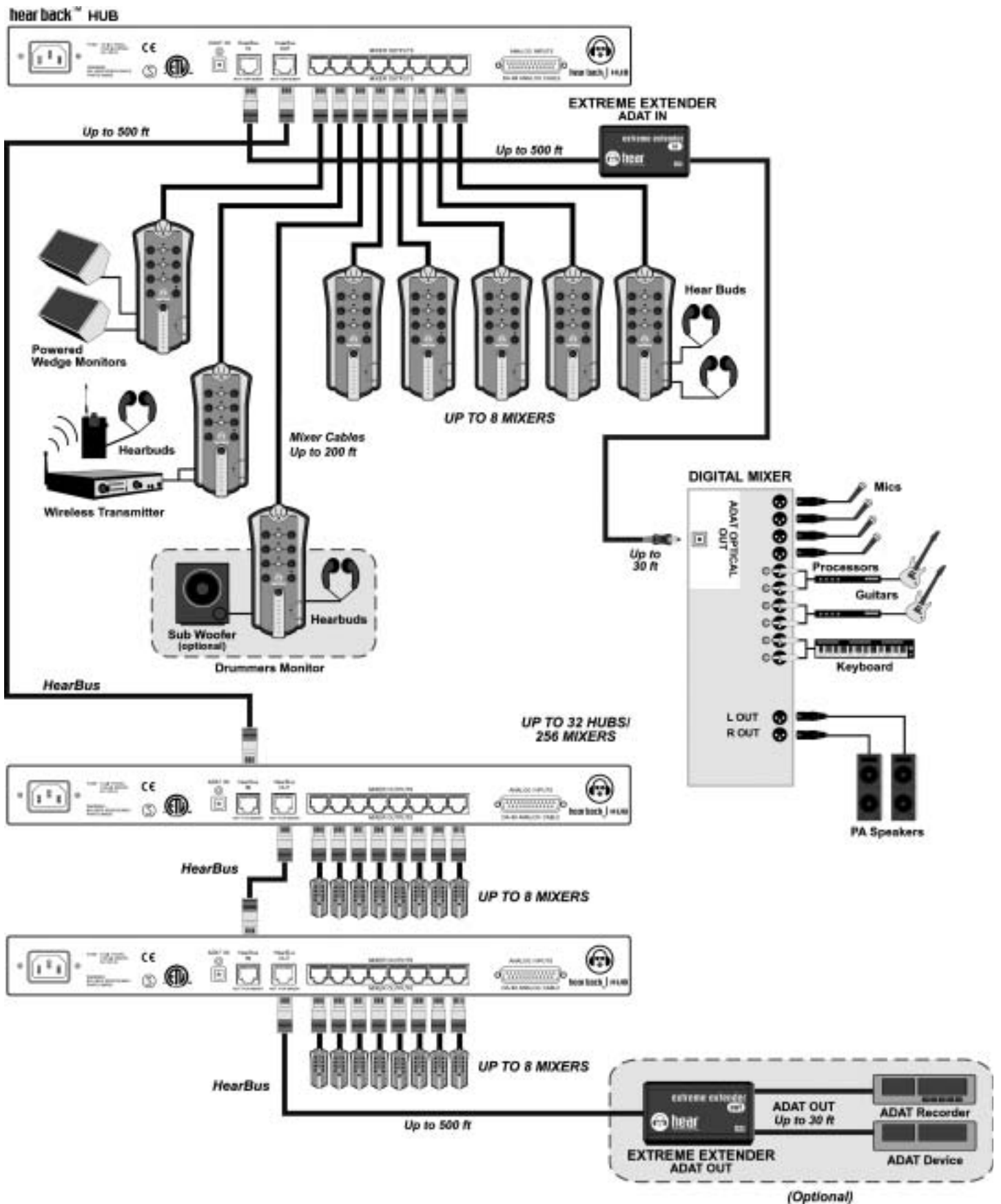






NOTE: Each hub gets the stereo mix and sectionals.
 Each master hub can have 31 hubs daisy-chained from it.







HEAR BACK SYSTEM ACCESSORIES

EXTREME EXTENDER ADAT IN/OUT

ADAT Extreme Extenders™ IN/OUT are available for converting from ADAT optical to HearBus and vice versa.



Extender Features:

- Extend ADAT® Optical cables up to 500 feet
- Convert HearBus to ADAT® Optical or vice versa
- Uses standard CAT5E cables
- Does not affect sound quality
- Small size, durable construction
- Clock Status LED on Extreme Extender OUT

The units were designed to solve ADAT optical distance limitations. The extreme extender ADAT IN converts ADAT optical to HearBus.

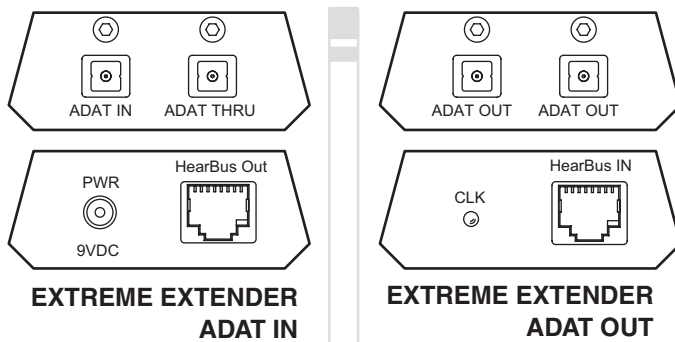
Using CAT5E the effective length of an ADAT optical interface can be extended up to 500 feet. This is accomplished without any loss of audio quality. The ADAT "Thru" output provides a buffered pass-thru for connection to local ADAT devices.

The Extreme Extender ADAT OUT converts the CAT5E HearBus to ADAT optical. Two parallel optical outputs on the Extender ADAT OUT provide drive for two separate ADAT devices. A bi-color clock status LED indicates the presence (green) or absence (red) of the ADAT clock.

In addition to acting as an ADAT optical extender, the Extreme Extender ADAT IN may be connected to the optical output of any ADAT device, such as a DAW, mixer, etc. and connected to the input of a Hear Back hub.

The extreme extender ADAT OUT can be connected to the HearBus out of a hub to obtain two ADAT outputs.

Connections:



ADAT® is a registered trademark of Alesis Corporation.

HEARBUDS & HEARBUD HEADSET MONITOR



Hearbuds™ provide an affordable in-ear monitor headset that delivers professional performance at a great value. By

creating acoustic chambers at the ear, hearbuds not only dramatically improve the sound of standard in-ear headphones and ear-pieces, their molded, 100% silicon, design also significantly reduces unwanted background noise levels - enabling you to enjoy sound clarity at lower volumes. Included in each package are three sizes for a perfect fit. And, because they're audiologically designed, they're comfortable to wear and won't fall out of your ears, either!

Features:

- Better sound quality at lower volumes
- Can be used on stage and in the studio
- Great for Hear Back, MP3 players, cell-phones, and other personal audio
- Hearbuds alone fit most in-ear headsets
- Works great in noisy environments because they block unwanted sounds
- Comfortable, safe, and secure
- Designed by audiologists
- Washable

CABLES - Quality cables that work with your Hear Back System.

CAT5E cables are available in 2, 12, 25, 50, and 100 foot lengths.

Optical cables are available in 6, 12, and 25 foot lengths.





OTHER HEAR TECHNOLOGIES PRODUCTS

TALK BACK

The Talk Back models 200 and 600, add talk back capability and control room monitor dimming to recording consoles, digital audio workstations, and portable audio workstations. Optional wired and wireless remotes (single and dual-button versions) are available for control of the talk back and/or monitor select functions. In addition to these features, the model 600 has control room monitor switching and optional wireless RF remote control.

The Talk Back permits the engineer to control talk back and monitor switching from: the front panel switches, the wired remotes, and the RF wireless remotes (600 only). Applications include professional recording studios, project studios, and video post-production facilities. The unit's features and audio specifications rival or surpass those found in large format recording consoles.



TALK BACK 600



TALK BACK 200



RC-1



RC-2

wired remotes
(optional for models 200 & 600)



RF-1



RF-2

wireless remotes
(optional for model 600 only)

LIMITED WARRANTY

Quantum Technologies, Inc. (QTI) warrants the equipment against defects in materials and labor for a period of one year from the original date of purchase. The duration of this warranty is limited to claims made to QTI within the periods stated with respect to parts and labor from the date of purchase. During the warranty period, defective equipment will be replaced or repaired to the general condition as received, at the discretion of QTI.

All transportation is the responsibility of the purchaser or owner. Equipment should be shipped in the original shipping box.

This warranty applies only to defects in materials and workmanship and does not cover failure or damage due to shipping loss or damage, abuse, misuse, misapplication, incorrect or varying power line voltages, lack of proper maintenance, natural disasters, acts of God, or unauthorized modifications, repairs, or any alterations done without the expressed written consent by QTI. QTI shall not be liable for any loss of use of the equipment, or consequential damages, including damages to other parts of the installation in which the equipment is a part.

QTI does not make any warranty, express or implied, other than the warranty contained herein. No agent, representative, or employee has the authority to increase or alter the liability, obligations, and terms of this warranty or sale of the equipment. NOTE: It is strongly recommended that any equipment returned to QTI be properly packaged and insured for its full value in case of loss, handling or shipping damage.

QTI shall not be responsible for damage or loss of equipment during shipment.

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