Setting Up Microphones on the HDA-1600 Amplifier

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URC HDA devices and software provide countless options to configure and optimize audio settings to achieve performance and flexibility for almost any application.

One of those features is the flexibility of theHDA-1600 amplifier and the microphone inputs.

This article provides a better understanding when configuring the**microphone inputs** on the HDA-1600 and details the procedure for configuring the **microphone input** settings when using Accelerator 3 or TC Flex 2 software.

When using microphones in an HDA system, it is important to set them up properly, using Accelerator or TC Flex 2 software. All the tools you need to calibrate your microphones are available and can be set live using URC software.

HDA-1600 rear panel microphone connections (see image below):



Configuration Steps:

- After connecting the microphone to the HDA-1600 chassis, open Accelerator or TC-Flex 2.0 software. Go to Step 9e in Accelerator, Step 7e in TC-Flex 2.0, click on the HDA-1600 amplifier.
- 2. Click on the zone that is using the microphone to set it up.
- 3. Select "Connect To Zone" (as shown in the image below).

Step 9 URC Audio Setup: Zone Audio Settings				
r 🚓 🖄			$\langle\rangle$	
a.Inputs b.Input Settings c.Permanent Z	one Groups d.Zone Assignment	e.Zone Settings	f.Sounds	g.Room Link Groups
Select Device with Outputs	Audio Settings:	Conne	ect To Zone	
HDA-8100(Office 8100Z1R) HDA-130 #1(Ktch 130#1 Z1LR) HDA-1600-70V(Bed 1600Z1LR) HDA-4100(LivRm 4100Z1,2LR)	Cone Type:	(©) Mono		
HDA-IO (Output)(Lake IOZ1) HDA-130 #2(Foye'r 130#2 Z1LR)	Zone Output:	◯ Fixed		
	Input Change Fade In	 Apply Globa 	al	
	Volume:	100 %	*	Apply Global
L	Turn On Volume:	🔘 Last Used	Preset	100 % -
Available Zone Outputs	Turn On Vol. Ramp Rate:	1.5 sec	•	Apply Global
Output Room Add Note Zone 1L Zone 1R Zone 1R	Filter Off High Pass	O Low Pass		

- 4. In the"Connect To Zone" window, Power the zone "ON".
- 5. Set a usable volume level.
- 6. **Select** the **microphone** in the **zone** (as shown in the image below).

Zone Settings					
Temporary Test Options]		
Zone Power : On On Sele	ct a source input :	8100 IN1 - VHS	*	Refresh From D	evice
Volume : 50 Nois	e Generator : 🍥 O	IO IN1 - Audiobox DVD 8100 IN1 - VHS 8100 IN2 - Realistic Cassette 8100 IN3 8100 IN4			
Zone Type: OMono Stereo Mono		8100 IN5 8100 IN6 BluDS Player SNP-2	ligh Pass 🔘 Low Pa	SS	
Zone Dutput: O Variable O Fixed		130#1 IN 1 - Pioneer Blu Ray 130#1 IN 2 - AM/FM Tuner 1500 IN 1 - Sindave DVD	Setting	Low Pass Filter Setting - Slope 0 12 dB/oct. Freq:	200 Hz 🔻
-Input Change Fade In Time: 1.5 sec *		1500 IN2 - FIO M5 1500 IN3 - Sylvania DVD 1500 IN4 - iPod Nano HDA-1600-70V MIC 1 HDA-1600-70V MIC 2	Gain: -6.0 dB 🔻	O 24 dB/oct. Gain:	0.0 dB 🔻
Max Volume: 100 %	*	4100 IN 1 - JVC Cassette 4100 IN2 - LG Phone 4100 IN3 4100 IN4) Treble Boost 🧕) Bass Boost 🛛 🔘 Param	etric EQ
Turn On Volume: O Last Used	• Preset 50 %	130#2 IN1 130#2 IN2	gs Band 1 Band 2	Band 3 Band 4	Band 5
-Tone Shaping Custom Setting:		Frequency 50) Hz 🔻 63 Hz 💌 1	125 Hz 🔻 10 kHz 🔻	16 kHz 🔻
Name: Custom Apply Attack : 5	50 🔻 Ratio :	5:1 T Gain 3	- 3 - 2	2 - 3 -	2 -
Threshold : 50 Thresh	50 👻 Volume :	50 T Quality Factor (Q) 0.	5 • 0.5 • 0	0.5 • 0.5 •	0.5 -
	ļ	Apply Cancel			

7. Next, go to Step 9b in Accelerator (Step 7b in TC-Flex 2.0). Select the HDA-1600 amplifier.

8. Select the **"Connect and Set Live"** option for the microphone that is being setup (as shown in the image below).

Step 9 URC Audio Setup: Input Set	ttings					
a.Inputs b.Input Settings cF	Permanent Zone Groups	d.Zone Assignment	e.Zone Settings	f.Sounds g.	Room Link Groups	
Select Device With Inputs						
HDA-IO (Input)(Office 8100Z1R)	Inputs					
HDA-130 #1(Ktch 130#1 Z1LR)	Input	Device	Input Level (db)	Stereo/Mon	o Sensor Delay	Sensor Threshold
HDA-4100(LivRm 410021,2LR)	Input 1	1600 IN1 - Sind	0	Stereo	5 sec	0.2 V
HDA-130 #2(Foye'r 130#2 Z1LR)) Input 2	1600 IN2 - Fio M5	+3	Stereo	6 sec	0.2 V
	Input 3	1600 IN3 - Sylv	0	Stereo	6 sec	0.2 V
	Input 4	1600 IN4 - iPod	+2	Stereo	3 sec	0.2 V
	Name Shure SM Limiter — Threshold Release : Volume : Noise Supp Threshold Sensor — Threshold Level :	-58 Mic 1 95 Atta 30 Atta 30 Ration 90 Coressor 95 Relea 2.5 mV Delay 6 dB C	ntom Power Off On dk : 30 • p: 2:1 • se : 50 • Parametric EQ pomect and Set Live	Nar Am Limi Thre Rele Volu Nois Thre Sen Thre Thre	ne	Phantom Power Phantom Power Off Off Attack : Ratio : 2:1 Release : 50 Delay : 6 sec Parametric EQ Connect and Set Live

9. SetPhantom Power to "ON" or "OFF", based on the microphone you are using (see image below).

10. Set the "Trim" value. This is the input level of your microphone.

a. Microphones that use Phantom Power tend to have a higher audio output, so the **Trim**" value will be lower for these microphones.

b. Microphones that are passive, that do not use Phantom Power, tend to require a higheffTrim" value.

11. View the front panel of your HDA-1600 – If you see the **Clipping**" **LED** for your microphone, **adjust** the **"Trim**" value up for your microphone until the "Clipping" LED momentarily lights up red while you are talking loudly into your microphone.

12. When the "**Trim**" value is set correctly, the "**Clipping**" **LED** will barely illuminate when you are speaking as loud as possible into the microphone or tapping the microphone.

Input Settings : Mic 1									
Phantom Power									
Limiter Threshold 95 Ratio: 2:1 Volume: 90									
Noise Suppressor Threshold : 95 Sensor									
Parametric EQ Settings Band 1 Band 2 Band 3 Band 4 Band 5									
Frequency 80 Hz • 125 Hz • 400 Hz • 1 kHz • 4 kHz •									
Gain 2 - 2 - 3 - 6 - 6 -									
Quality Factor (Q) 0.7 • 0.7 • 0.7 • 0.5 • 0.5 •									
Apply Cancel									

13. Example settings for a non-Phantom Power microphone, Shure-SM58 (see image below):

Input Settings : Mic 1	
Phantom Power Off On Level -7 dB Refresh From Device	
Limiter	_
Threshold : 95 Attack : 30 Release : 30 *	
Ratio : 2:1 Volume : 70	
Noise Suppressor	ζ
Threshold : 50 Release : 50	
_ Sensor	
Threshold : 2.5 mV Threshold : 2.5 mV Threshold :	
Parametric EQ Settings	5
Band 1 Band 2 Band 3 Band 4 Band 5	
Frequency 80 Hz T 125 Hz 400 Hz T 1 kHz 4 kHz T	
Gain 2 • 2 • 3 • 6 • 6 •	
Quality Factor (Q) 0.7 • 0.7 • 0.7 • 0.5 • 0.5 •	
	_
Apply Cancel	

14. Example settings for a Phantom Power microphone, Neewer NW-700 (see image below):

Input Settings : Mic 2
Phantom Power Trim Level16 dB * Refresh From Device
- Limiter
Threshold : 75 ~ Attack : 0 ~ Release : 0 ~
Ratio : 2:1 Volume : 40
Noise Suppressor
Threshold : 50 × Release : 50 ×
- Sensor
Threshold : 2.0 mV Threshold : 2.0 mV Threshold : 6 sec Threshold : 0 mV Thresho
Parametric EQ Settings
Band 1 Band 2 Band 3 Band 4 Band 5
Frequency 80 Hz * 125 Hz * 250 Hz * 1 kHz * 4 kHz *
Gain 5 • 4 • 3 • 0 • 0 •
Quality Factor (Q) 10.0 • 10.0 • 10.0 • 1.0 • 1.0 •
Apply Cancel

15. Limiter: A Limiter's main function is to bring up the audio level of the microphone without allowing the peaks to cause the signal to clip.

Limiter Parameters

Threshold

Limiters will have an adjustable threshold level, which is also often referred to as the "ceiling".

This sets the signal level at which the Limiter begins compressing the microphone's audio. Compression does not occur until the signal level reaches the threshold, and compression will cease once the incoming signal level drops below the threshold.

Ratio

Your ratio control lets you decide how much compression is applied once the microphone signal crosses that threshold — the actual ratio being referred to is the input level compared with the output level. At a ratio of 2:1, for example, every 2dB of signal level over the threshold will be compressed to deliver only 1dB of signal level increase at the output stage.

Attack

The attack control on a Limiter determines how long it takes for the compressor circuit to reach (nearly) full compression — these are often very short values timewise, sometimes down into the microsecond range. A good way to look at the attack control is that it determines how much of a sound's initial attack will be

compressed — longer attack times allow more of the initial attack to slip through before compression begins.

HDA Limiter Attack times are minimum 5 ms, maximum 100 ms.

if Attack Time in Accelerator is set to =< 5, actual attack time = 5ms

if Attack Time in Accelerator is set to = 6, actual attack time = 6ms

if Attack Time in Accelerator is set to = 7, actual attack time = 7ms

if Attack Time in Accelerator is set to = 8, actual attack time = 8ms

if Attack Time in Accelerator is set to = 9, actual attack time = 9ms

if Attack Time in Accelerator is set to = 10, actual attack time = 10ms

...and so on

if Attack Time in Accelerator is set to = 100, actual attack time = 100ms

Release

Like attack, the release control determines how long it takes compression to stop once the incoming microphone signal level falls below the threshold. Setting this control too short can cause the compressor to "pump" or "breathe" — setting the release too long can cause equally unnatural sound effects.

HDA Limiter Release times are minimum 25ms and goes to 5 seconds. if Release Time in Accelerator is set to = 0, actual release time = 25ms if Release Time in Accelerator is set to = 1, actual release time = 50ms if Release Time in Accelerator is set to = 2, actual release time = 100ms if Release Time in Accelerator is set to = 3, actual release time = 150ms if Release Time in Accelerator is set to = 3, actual release time = 200ms if Release Time in Accelerator is set to = 4, actual release time = 200ms if Release Time in Accelerator is set to = 5, actual release time = 250ms if Release Time in Accelerator is set to = 5, actual release time = 300ms if Release Time in Accelerator is set to = 6, actual release time = 300ms if Release Time in Accelerator is set to = 7, actual release time = 350ms if Release Time in Accelerator is set to = 8, actual release time = 400ms if Release Time in Accelerator is set to = 9, actual release time = 450ms if Release Time in Accelerator is set to = 10, actual release time = 500ms

Level (Makeup Gain)

Because Limiter compression essentially lowers the volume of your microphone audio in a dynamic, intelligent way, you may need to apply some makeup gain to bring the signal level back up after compression occurs. Use the output level or gain control on your compressor in conjunction with its bypass button to quickly compare and match the level of your compressed audio to the incoming signal.

So Where Do I Start?

You could start with the example settings for a Phantom Powered Microphone and a non-Phantom Powered Microphone listed earlier in this document. Or you can tune the limiter yourself. Regardless of what type of audio signal you are applying a Limiter to, it will be helpful to have a go-to starting point with any Limiter. With the controls set as explained below, you will be in a good position to tackle setting up a microphone's Limiter.

Threshold

Start with this turned all the way up (set to 100 in Accelerator). By doing this, you'll be able to gradually introduce compression by lowering the threshold, which will better help you hear the effect it's having on your audio.

When testing a Limiter with a Microphone, use the "Connect and Set live" option in Accelerator, Step 9b for an HDA-1600.

When testing the preset "Tone Shaping" limiters for a zone, along with setting the "Custom" Tone Shaping Limiter for a zone, use the "Connect To Zone" option in Accelerator, Step 9e.

Attack/Release

There is a lot of nuance in these controls; a good place to start would be "50" for both of them.

Ratio

Start with a moderate setting of 2:1. You can always increase or decrease this after you have gotten the threshold and attack/release controls dialed in.

Level (Makeup Gain)

Start with this at "0" (no boost or cut). Increase this setting as desired to increase the audio output level for the selected source at the zone's speakers.

HDA Uses "Soft Knee" Compression

A soft knee setting applies the compression gradually until the full ratio is reached. This makes the transition from uncompressed to compressed audio smoother and less abrupt. Also, soft knee settings do not wait until the threshold has been crossed to apply compression. Instead, the compressor gradually applies compression to the audio signal as it approaches the threshold and does not reach the full ratio amount until somewhere past the threshold.

16. **Noise Suppressor:** A Noise Suppressor is essentially a system that softly mutes the microphone when it is not in use. This helps with eliminating background noise and feedback when the microphone is not being

spoken into.

a.**Threshold:** The THRESHOLD control sets how sensitive you wish the Noise Suppressor to be, i.e. the "threshold" at which the Noise Suppression begins to do its work. Setting the THRESHOLD to "0" will cut nearly everything, including loud signals. A Threshold setting of "100" will result in the Noise Suppressor essentially not cutting any signals at all.

b.**Release:** The release control is used to define the length of time the Noise Suppressor takes to change from open to fully closed. It is the fade-out duration. A fast release abruptly cuts off the sound, whereas a slower release smoothly attenuates the signal from open to closed, resulting in a slow fade-out.

c. A good place to start is to set both the Threshold and the Release times to "50" and adjust them from that point.

Input Settings : Mic 2									
Phantom Power Off On Trim Level -16 dB Level -16 dB Climiter Climiter Threshold : 75 Ratio : 2:1 Volume : 40 Climiter									
Thresho	Noise Suppressor Threshold : 50 Release : 50								
Thresho	ld : 2.0 mV	•	Delay : 6 sec	¥					
Parametric EQ	Settings ——								
	Band 1	Band 2	Band 3	Band 4	Band 5				
Frequency	80 Hz	125 Hz	* 250 Hz *	1 kHz *	4 kHz 🔻				
Gain	5 .	4	- 3 -	0 -	0 -				
Quality Factor (Q)	10.0	10.0	· 10.0 ·	1.0 *	1.0 -				
		Apply	Cancel						

17. **Sensor:** These settings are used to affect logic in macros by providing the ability to trigger a logic event by audio being present or being ended into a microphone. Typically, the default settings will work fine for most

applications. If you are experiencing "false" triggers you may want to adjust the Threshold and Delay settings. Each microphone setup is unique.

Input Settings : Mic 2
CPhantom Power
○ Off ○ On Level -16 dB ✓ From Device
-Limiter
Threshold : 75 • Attack : 0 • Release : 0 •
Ratio : 2:1 * Volume : 40 *
Noise Suppressor
Threshold : 50 × Release : 50 ×
Sensor Threshold : 2.0 mV Delay : 6 sec
Parametric EQ Settings
Band 1 Band 2 Band 3 Band 4 Band 5
Frequency 80 Hz • 125 Hz • 250 Hz • 1 kHz • 4 kHz •
Gain 5 • 4 • 3 • 0 • 0 •
Quality Factor (Q) 10.0 IO IO
Angle Consul

18. The Microphone's Parametric EQ:

A high-quality parametric EQ is one of the most important tools when "tuning" the sound of microphone. Each microphone input has its own dedicated Parametric EQ. The Microphone's Parametric EQ is designed to provide greater and more accurate control over tone and frequency – a significant leap beyond just simple bass and treble tone controls. They can raise (boost) and lower (cut) the decibel output of specific bands (frequencies of sound).

Setting up the Microphone's Parametric EQ

Frequency Value

Each band allows you to set the band's frequency position by clicking and an selecting the frequency value.

ſF	Parametric EQ	Settings —									
Ι.		Band	1	Band 2		Band 3		Band 4		Band 5	
	Frequency	80 Hz	*	125 Hz	*	250 Hz	*	1 kHz	*	4 kHz	•
'	Gain	5	*	4	*	3	*	0	*	0	*
	Quality Factor (Q)	10.0	*	10.0	*	10.0	Ŧ	1.0	Ŧ	1.0	*

Gain Value

The middle row allows you to set the gain value of the band, which is by how much you boost or cut the selected frequency of the band. Gain values range from -20dB to 6dB.

ſF	Parametric EQ	Settings —						
		Band	1 Band	2	Band 3	Band 4	Band 5	
	Frequency	80 Hz	* 125 Hz	* 25	50 Hz 🔻	1 kHz	* 4 kHz	*
	Gain	5	× 4	× 3	-	0	· 0	*
	Quality Factor (Q)	10.0	· 10,0	~ 10	0.0 -	1.0	* 1.0	•

Q Value

The bottom row is the Q value and controls the width of the band or simply put how many frequencies will be affected by the band. A high Q value will give you a wide band and affect more frequencies. A low Q value will give you a narrower band and is great to cut or boost more specific frequencies.

(P	arametric EQ	Settings —									
		Band 1		Band 2		Band 3		Band 4		Band 5	
	Frequency	80 Hz	*	125 Hz	*	250 Hz	*	1 kHz	Ŧ	4 kHz	*
	Gain	5	Ŧ	4	-	3	*	0	-	0	*
	Quality Factor (Q)	10.0	Ŧ	10.0	*	10.0	Ŧ	1.0	Ŧ	1.0	•

19. The Microphone User Interfaces:

a. Residential



Additional Information & Resources:

To learn more about HDA products and programming, please see the HDA Programmers Guide, the HDA Modules Users Guide, or the Accelerator 3 online Programming Guide.