



HALL RESEARCH AD-340 UNIVERSAL AUDIO DELAY PROCESSOR

By Christopher Maione



I have been asked to review what I consider to be a niche product—not one you would find in many AV designs. It's from Hall Research—a company that's been around since 1984 and focuses primarily on audio/video distribution equipment using Cat5 cabling.

My initial reaction to first seeing the product was "What applications could I use this for?" and then I dove in to see what this magic little box was all about.

What follows is a product review—but along the way I obtained a much better understanding of a company in our industry making some really cool products—quality electronics—with a host of very cost-effective Cat5 solutions including:

- Video splitters & extenders
- Matrix switchers
- Video processors
- USB extenders
- KVM switchers
- AV Projector Controllers

The AD-340 is a "universal audio delay processor." Simply stated, it takes line level audio "in" and delays it to the output by up to 510 milliseconds. This sort of audio delay is very helpful in a variety of applications including:

- Delaying the audio signal to synchronize with video
- Delaying audio to compensate for distances (the speed of sound is relatively slow)
- Improving perceived speech audio quality (The Haas effect)

The AD-340 is ideal for any application where you need to slow down the audio signal.

Some specific examples of this would include:

- If all you want to do is to add some delay to some speakers in an auditorium, or hall (and if distances between front and rear speakers are more than around 50 feet, that would be necessary due to the propagation time of sound waves through the air), then the AD-340 is a perfect and simple solution (particularly since you can simply dial the delay in distance ft/meter). The alternative would be using a much higher priced audio processor.
- The advent of HDMI and high definition video has placed a video

processing burden on displays. This processing causes delay. Most LCDs actually delay the audio to match the video processing delay to re-synchronize it to the video for the TV's speakers. But in most cases TV's speakers are inadequate and one is inclined to use the audio output from the HDMI source. The HDMI audio will be leading the video and lip-sync will be noticeable (not to mention the fact that if the TV speakers are not completely muted, then you will have incomprehensible and conflicting audio). A nice use for the AD-340 is to add delay to the source audio so the original audio is delayed by the same amount as the video fixing the aforementioned issues.

Features of the AD-340 include:

- Delay analog or digital audio in milliseconds, frames, or distance
- Analog to Digital and Digital to Analog conversion
- Supports CD, DVD, and Blu-Ray sample rates at 32kHz, 44.1kHz, 48 kHz and 96kHz
- Supports 2-channel linear PCM digital audio and 5.1 Channel Dolby Digital and DTS encoded bitstreams
- Delay up to 510 ms
- Delay calculation based on distance with optional automatic temperature compensation
- Stereo Analog RCA inputs are ground loop isolated to prevent spurious buzz or hum
- USB interface for advanced control

UNDER THE HOOD

Here is my nine-point detailed review of the AD-340 Universal Audio Delay Processor:

1. Physical construction

The physical layout and construction of the product is excellent. The enclosure is small and sturdy. The unit has a mounting bracket attached which allows it to be easily secured to rack rails or a rack shelf (it's almost too small to be conventionally rack mounted). Power is provided via a 6-volt adaptor. The power connector ships with all the various international AC adaptors.

2. Review of inputs, outputs, controls and indicators

moreonline

This video shows the Hall Research AD-340 in action. Visit avtechnologyonline.com/dec11



Front Panel:

- Controls and indicators are evenly spaced and properly labeled. The select buttons have a definitive "click" to their operation.
- A red LED display shows the amount of delay in either time (milliseconds) or distance.
- The mini USB port provides connectivity to run the application and setup software.

Rear Panel:

- At the back of the panel there are RCA connectors (Left / Right), along with the digital audio (SPDIF), for both the input and output signals to be connected. Very simple and straightforward.

3. Technician level "user friendliness"

Clear cut. Easy to setup, wire and configure.

Setting up the AD-340 should take less than 10 minutes. The application software can also be used for setup but is not required to make the unit operate.

Some interesting points to note:

- The audio delay can be setup using time (in milliseconds) or distance.
- The delay of 510 ms provides for approx. 510 feet of equivalent audio distance.
- The audio delay can be set to match video frames, up to 16 frames of delay.
- The inputs can be adjusted to accept microphone inputs.
- The unit will also decode the digital (SPDIF) signal to analog.

4. End-user/operator level "user friendliness"

Operation from the front panel is very uncomplicated and intuitive.

5. Review of the software application control screens

The software interface is very simple; a single page gives you a dashboard peek into all settings and controls.

The added benefits and functionality provided by the software vs. the front panel operation include:

- Sampling Rate Indication
- Temperature Compensations
- Audio Gain Adjustment
- Error Indications
- Analog, Digital and Auto Mute
- Front Panel Lock

6. Overall operation of the equipment

Operation of the AD-340 was excellent. Audio quality was crisp and clear with no noticeable distortion. The delay did exactly what is supposed to do, slow down the audio from input to out-



put through the unit by milliseconds. The front controls were responsive and as I increased the millisecond counter the audio delay immediately followed.

7. Review of user manuals/operator instructions

Documentation in the box included a 24-page manual, a CD containing the manual as a PDF and the application control software.

8. Website

The website page for this product is easy to navigate and provides all the relevant information as well as a YouTube video on the product. Information for the product included:

- | | |
|---------------------|----------------------------|
| • Data Sheet | Excellent |
| • Drawings | None |
| • Diagrams | Excellent |
| • Product Photos | Excellent |
| • Technical Manuals | Excellent |
| • Firmware Files | Good - Version 1.0 release |

9. Price Point: MSRP \$335

This is a great price point for a powerful little box which does exactly what it was designed to do.

FINAL THOUGHTS

The AD-340 is a niche product designed for

very specific applications where audio delay is required. This product has great application for use in sound systems in any medium to large size halls where multiple speaker zones, separated by distance need to be delayed.

It's also a great tool in the video edit suite where video to audio synchronization is required.

The engineers at Hall Research did a great job developing a straightforward, simple and very useful "tool" for the audio world. HR focuses on the performance of its cost effective products and the technician/user friendliness. The inclusion of shipping the product with the various international AC adaptors with its power connectors is one way that this company shows its focus on user experience. With regard to its focus on performance, HR was able to concentrate its engineering and design for this product to specifically and comprehensively address a niche need for audio delay.

Christopher Maione, CIS-D, is president of Christopher Maione Associates, a firm specializing in all aspects of AV business, technologies, emerging trends, and marketing strategy. He serves as an InfoComm Adjunct Faculty, Approved CIS RU Provider, and sits on several AV standards committees.