MIX
Professional Audio and Music Production

IK Multimedia Advance Room Correction ARC Software

FIELD TEST

by Barry Rudolph

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IK Multimedia, in partnership with Audyssey® Laboratories, which was conceived at the prestigious Immersive Audio Laboratory at the University of Southern California in Los Angeles, California, has Advanced Room Correction or ARC the first plug-in room correction DAW software. Chris Kyriakakis and Tomlinson Holman, who have over the past 10 years conducted research in audio signal processing, acoustics, and psychoacoustics, founded the Immersive Audio Laboratory.

This complete package includes a stand-alone, software-based measuring tool with onscreen step-by-step instructions and an omni condenser measurement mic to be used with your own mic preamp. The mic has a frequency response of +/-1.5dB when used with the ARC System. The manual says to use a transformerless mic pre-amp as units with transformers may color the sound and the measurements. I tried both my RTZ Audio microphone pre-amp with transformers and my hand-built Five Fish Studios SC-1 direct-coupled unit. Apparently both were flat enough--I could discern no difference in the results with either pre-amp.

The second half of the ARC is the corrective plug-in. It works in RTAS, VST or Audio Units (Mac or PC host DAW computers), uses 32-bit floating-point arithmetic and supports session sampling rates from 32 to 96 kHz.

SIZING UP YOUR ROOM

The measurement software uses Audyssey's MultEQ® to analyze patterns in the time domain and frequency responses at many locations within the room's listening area, and classifies them into clusters based on their similarities. A representative response is created for each cluster with a final response created by grouping them.

This final response is used to create a room EQ filter profile that corrects frequency and phase anomalies within the area defined by the many measurement locations. This data is named and stored as a 3.1MB file for later use in the ARC corrective plug-in.

Measurements and subsequent correction can be made in any size room and over large listening areas such as home theatres, large professional recording studio control rooms, dubbing stages, or in small home studio setups.

The measurement software has five steps to guide you through measuring the speakers and room. To run ARC in Pro Tools, first quit the program to allow Digidesign's Core Audio application to launch and run at the required 48kHz sample rate. With the mic plugged into your preamp, you'll immediately see activity on the GUI's peak-reading meter.

I located my chair to the "mixer's sweet spot"--equidistant, four feet from my ADAM S2.5A speakers that are placed left and right in front of my Pro Tools workstation. I put a sticky paper dot directly under the center of my chair on the plastic chair mat on the floor beneath. This became position one for system calibration and starting all measurements.

To make the process repeatable, I created a layout of microphone positions on the mat using numbered dot markers spaced at 6-inch intervals--all within the shape of a large oval--with my sweet spot as the center. You'll need to take a minimum of 12 measurements whose sequential order must alternate or mirror each other from side to side and from front to back. For the highest accuracy, I placed dot markers for the system's maximum of 32 measurements.

To calibrate at position one, a continuous stream of pings from both speakers is emitted in step 3. These pings are short-frequency sweeps from low to high. When the words "Signal level is OK" light up solidly in the GUI, you've got enough signal level to continue with your measurements.

I started my measurements making sure that the microphone was pointed at the ceiling and at the height of my ears while sitting in the chair. Any extraneous noises--such as a loud truck going by or A/C noise during a measurement step--will necessitate repeating that step.

The software accomplishes each measurement by sending 10 pings--first from the left and then from the right speaker. The GUI then prompts you to move the mic to the next position. Then once you click on "Take Measurement," you have three seconds to get out of the way before the next set of pings starts.

Once all 32 measurements are made, click "Finish" and the software creates a correction profile file. You can rename/delete profile files only by drilling down to the ARC folder in HD/Library/ Application Support/IK Multimedia/ARC. The ARC corrective plug-in is the only place you can check and hear the results of your measurements. It would make sense to have the graphical information show up in the measurement tool before you boot up your DAW. Immediate changes in the speakers and/or room could be quickly verified with another set of measurements.

THE ARC CORRECTIVE PLUG-IN

In Pro Tools, the ARC corrective plug-in runs in a Master Fader. This works out perfectly since I always bus the mix to two new audio tracks that are monitored via a Master Fader. Do not record through the ARC plug-in. If your DAW precludes a separate monitor path, just remember to turn off ARC before you record your mix.

The ARC plug-in graphically indicates the responses of the left and right channels. The original response of the room is shown in orange and the corrected response is shown in white. A peak-reading meter shows pre or post-correction levels. A pull-down menu lets you select the desired target curve to run along with the corrective profile.

MultEQ offers four target curves: Flat is the flat correction of the room response only to the extent of the upper and lower-frequency limits possible with your loudspeaker system; HF roll-off 1 adds a slight roll-off of highs to compensate for untreated, live listening spaces; Flat MidComp compensates for directivity differences due to horn-loaded speakers and/or the response peak at the speaker's crossover frequency; and HF roll-off 1 MidComp is a combination of the previous two choices.

A Preference window sets the plug-in to remember settings, the profile for the next instance and whether speaker delay trimming is enabled. Speaker delay is for setups where the distances of the speakers to the "sweet spot" are not all the same. The ARC software can detect speaker distances to a 1/4-inch resolution. Unfortunately, this option comes up turned on by default, and unless your measured sweet spot (position one) is exactly equidistant from the left and right speaker, then the sound will be phasing and terrible. It is not needed for stereo monitoring and should be switched off by default.

Last, for A/B'ing room correction on/off, the ARC plug-in's level control can bring the level back up after correction. Once I did this a few times, I didn't bother any more.

THE RESULTS

My mix room is small but acoustically well-treated with good absorption on the walls and ample ceiling diffusion. Nearly all of my room anomalies were in the bass frequencies with peaks at 70, 180 and 500 Hz, along with noticeable dips at 90 Hz and 1.5 kHz. The left speaker, which is close to a solid wall, showed dips and peaks of greater amplitude while the right speaker, closer to an open doorway, showed less. The corrective curve followed this with less and smoother-looking correction for the right than the left. There were a couple of smaller dips and bumps in the midrange, which I attributed to the sonic signature and 1.8kHz crossover point of the ADAM speakers.

The graphical display in the ARC plug-in is not finely calibrated, so you only get a general idea of the room's response. Clearly, IK Multimedia intends for ARC to serve as an easy-to-use problem-solver rather than a comprehensive, supertechnical instrument for acoutiscians. To check my work and for consistency, I did a dozen sets of measurements. The overall differences were nil--at least as far as I could hear and resolve using the ARC plug's graphic.

LIVING WITH CORRECTION

To be honest, I was not ready to get used to my monitors all over again with correction running. Frankly speaking, my ADAM S2.5As sound boring with correction running; the euphonic hype of them playing music in my small space is flattened out. Although maybe not as fun, it's all good sonic medicine.

With correction on, I now understand certain producers' critiques about elements of my mixes. Although mastering usually fixed all of the blemishes, before correction I was finding that vocal and guitar tracks would sound thick in the 400 to 600Hz range. The peak in the 500Hz area explained that and then the 70- and 180Hz bumps caused mixes to be slightly thin overall unless I purposely pushed kick and bass; I was hearing too much of these frequencies and twisting EQs an levels to compensate.

So at this point, I'm mixing with correction and rethinking a lot of what I do. I think it is wonderful to have the ability

to check the room and monitors to see and hear the problems. IK Multimedia's ARC System will "tune up" any listening space so you can hear the way the mix actually sounds and be confident in how it will translate to other playback systems. Prices: $599; IK product cross-grade, $499.

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