6. Closing Thoughts and References

By David Das

Contents

Closing Thoughts 2
References 6

Closing Thoughts

Acourate designed by Dr. Ulrich Brüggemann is the most advanced and feature rich Digital Room Correction software available.

The closest competitor is Audiolense, however it lacks the granular control that Acourate provides.

These two are head and shoulders above the rest of the pack that includes DIRAC, RePhase, and DRC.

I asked Uli what got him so deeply involved in the science of Digital Room Correction and what was the inspiration behind his project?

He replied that he stumbled upon a TacT Audio RCS Digital Equalizer/Preamp in 1998 and began diving into the topic of DRC. He began writing his own software so that he could create his own Filters for this RCS device.

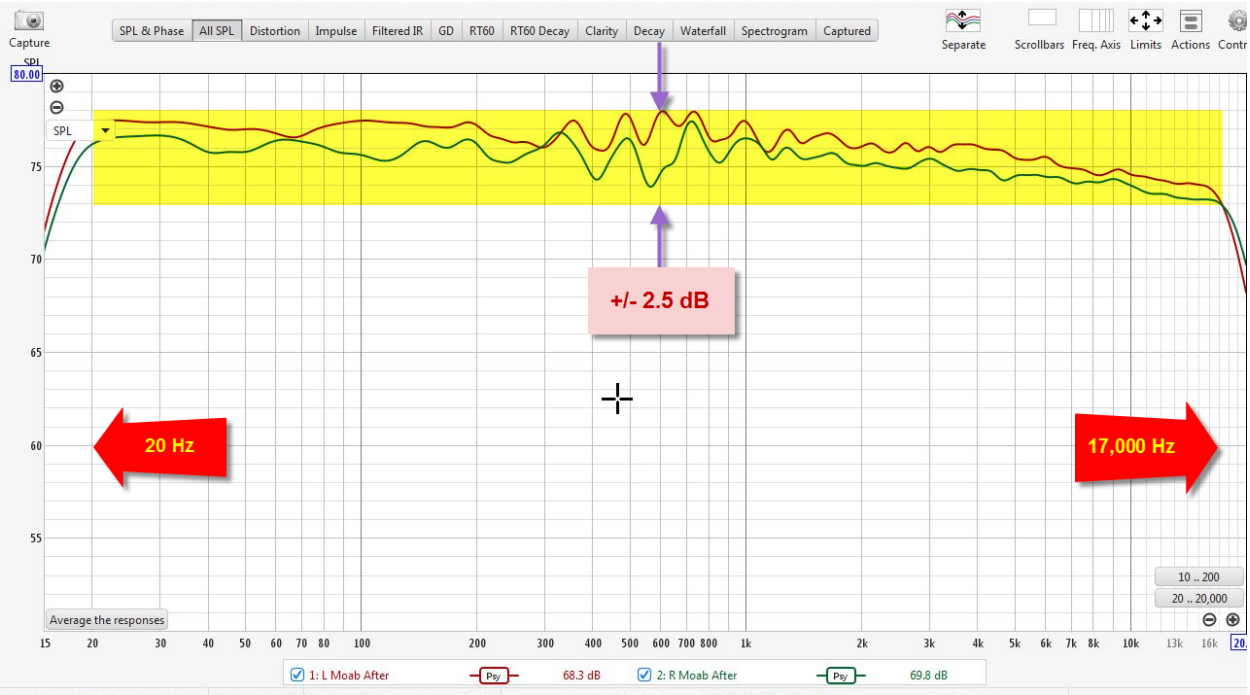
Stereophile Magazine ran a glowing review of this device in 2001.

The RCS device (with the A/D and D/A modules) was priced at $4,248. They are no longer made.

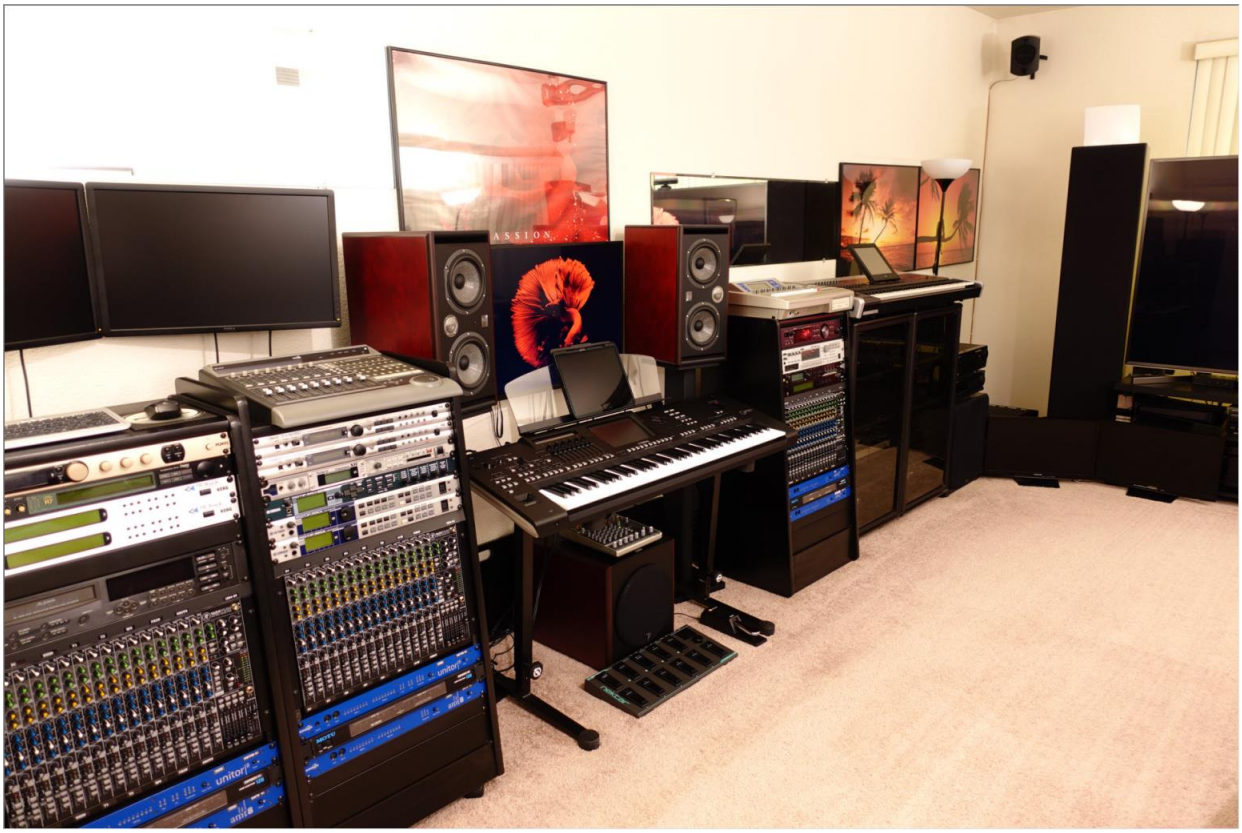
Legacy Audio makes the Wavelet 2 DAC/Preamp/Processor that provides Digital Room Correction with Time Alignment for $7,950.

The ACOURATE + ROON combo offers a much more affordable pathway to Digital Room Correction at a fraction of the cost.

I am 100% satisfied with the improvements I heard on my Tekton MOAB main speakers.



The knowledge I gained after taking a deep dive into the science of Digital Room Correction is invaluable. Thanks to the guidance and professional expertise of David Synder I have discovered the ultimate way to calibrate my Focal and ADAM studio monitors.

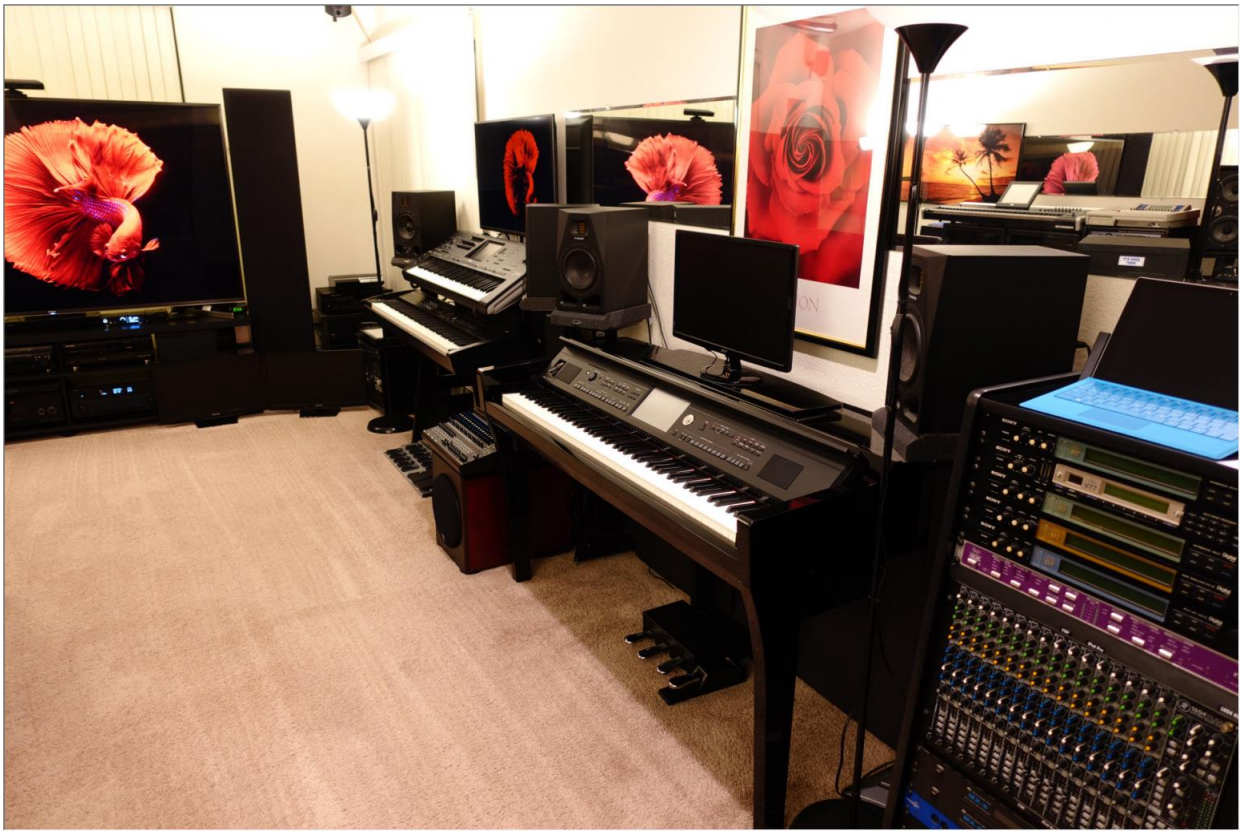


The best part is that once you have taken the time and effort to learn the process of Digital Room Correction with ACOURATE + ROON, you can create a series of Presets for all your 2-Channel setups.

If you are an audiophile or if you are someone who enjoys recording and playing musical instruments, then ACOURATE + ROON gives you the ideal way to hear an accurate playback.

Properly calibrated speakers elevate your music listening experience. Your brain is no longer straining to compensate for the unnatural peaks and valleys. You hear an even frequency response across the spectrum. With time aligned speakers, the music comes alive. Instruments and vocal sound natural and real.

It sounds perfect.



Life is music!

Best regards,

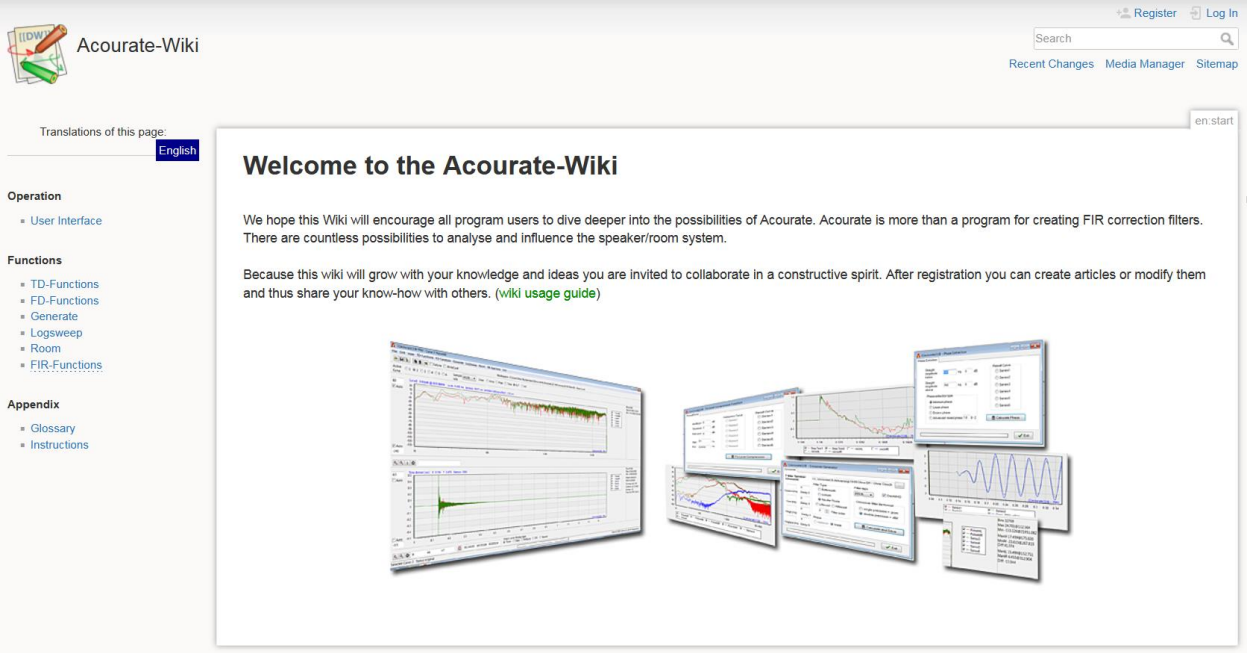
David Das
Das.t@att.net

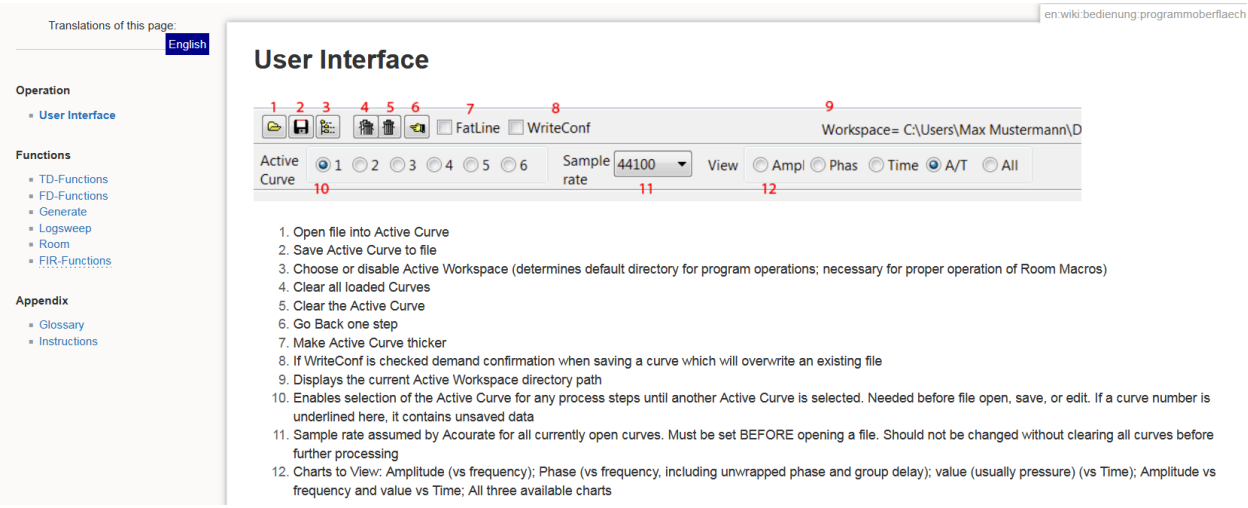
References

1.

Acourate-Wiki.
Think of this as the On-Line User Guide that explains the User Interface and Functions.

https://www.audiovero.de/acourate-wiki/doku.php?id=en:start





2.

A quick Introduction to Acourate by Dr. Ulrich Brüggemann

https://www.acourate.com/freedownload/AQuickIntroductionToAcourate.pdf

3.

Acourate-Option PRC Pre Ringing Compensation.

https://www.audiovero.de/pdf/AcouratePRCen.pdf

4.

ICPA – Optimization of Non-Symmetric Stereo Setups

www.audiovero.de/freedownload/AcourateVersion2en.pdf

5.

Acourate V3 – Optional Linearization of drivers.

http://www.audiovero.de/freedownload/AcourateVersion3en.pdf

6.

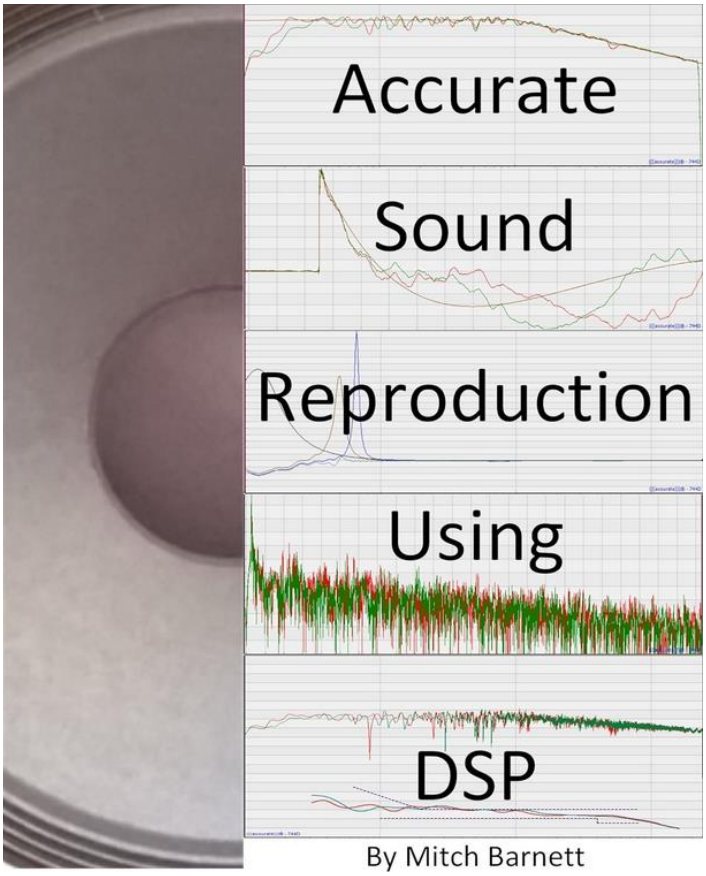
Acourate Documents and Tutorials

https://www.audiovero.de/en/documents-and-tutorials.php

7.

Accurate Sound Reproduction using DSP by Mitch Barnett

https://www.amazon.com/Accurate-Sound-Reproduction-Using-DSP-ebook/dp/B01FURPS40



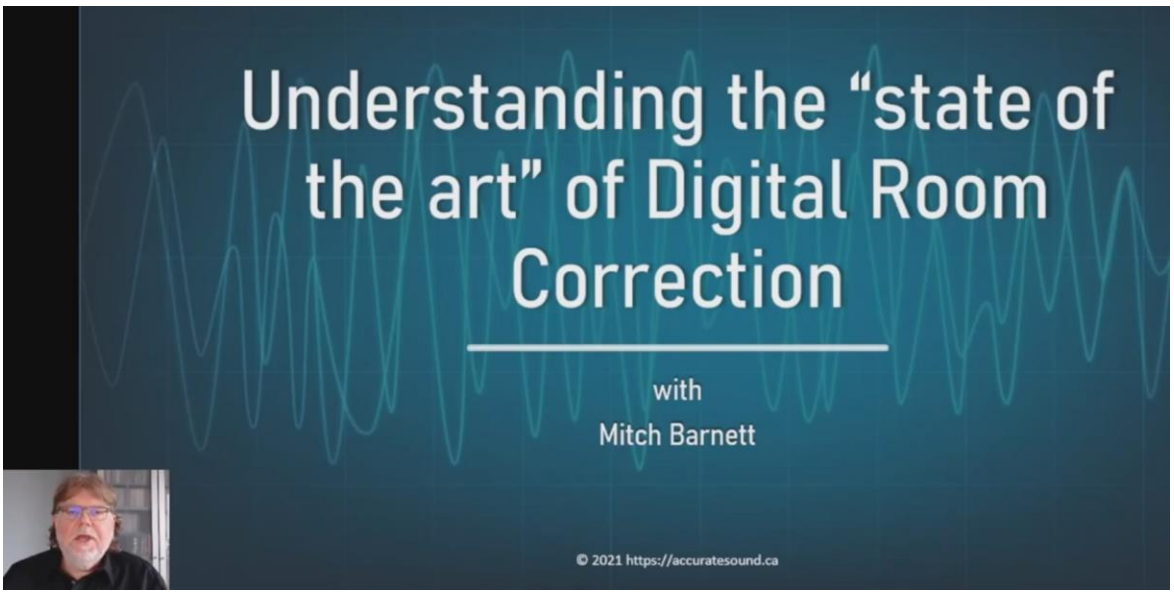
This is an excellent guide for learning how to use Acourate. Mitch explains the entire process of generating FIR Filters in pages 14 through 56.

If you plan on importing these FIR Filters to JRiver's Convolution Engine, this is your reference.

8.

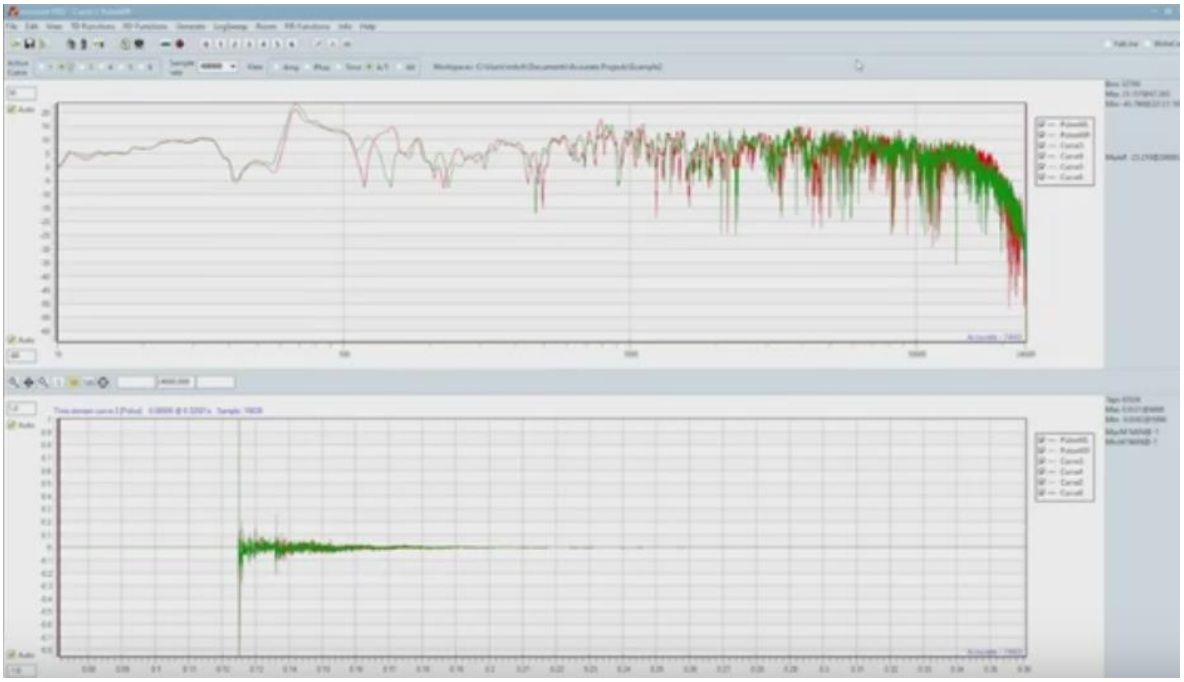
Understanding the “state of the art” of Digital Room Correction with Mitch Barnett

https://www.youtube.com/watch?v=yfGAUvyvdNU



In this YouTube video Mitch gives a hands-on demo on how to generate a FIR Filter using Acourate and Audiolense.

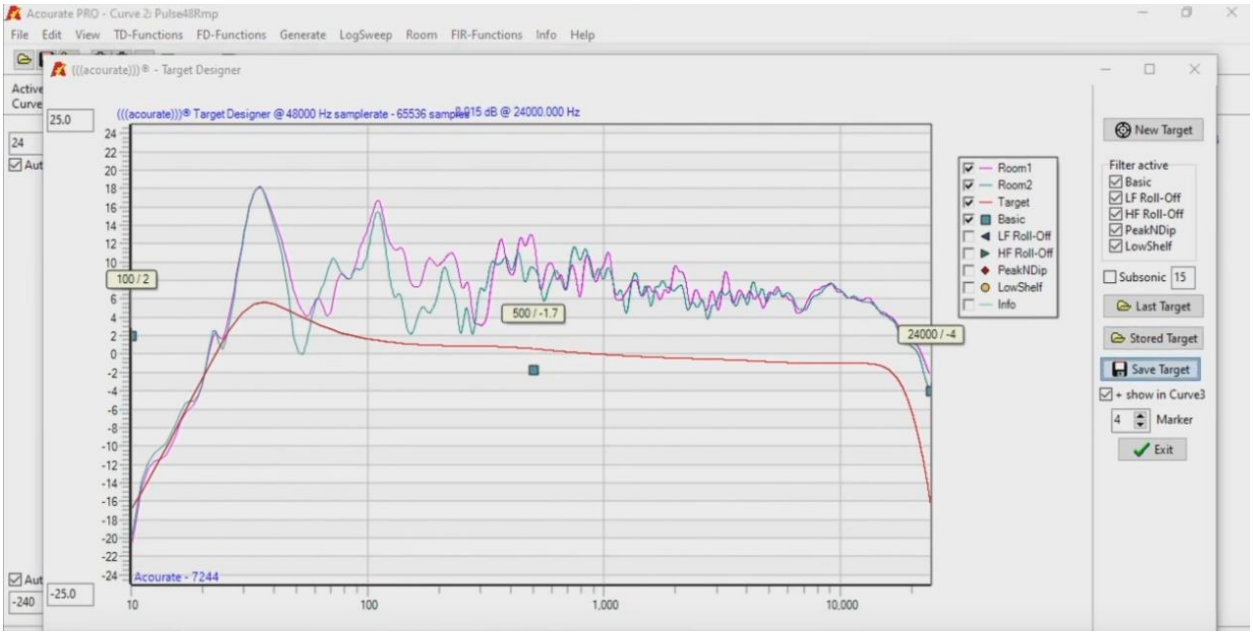
Play close attention to 15-minute section beginning at 54 minutes. This is the Acourate demo.



9.

Overview of Roon + Accurate Room Correction Workflow by David Snyder

https://www.youtube.com/watch?v=o-DEKzFct9w



In this YouTube video David Snyder explains how he generates the FIR Filters in Acourate making the necessary corrections to Amplitude and Time.

David is the Secretary of the Arizona Audio Video Club and a member of the Audiophile Foundation.

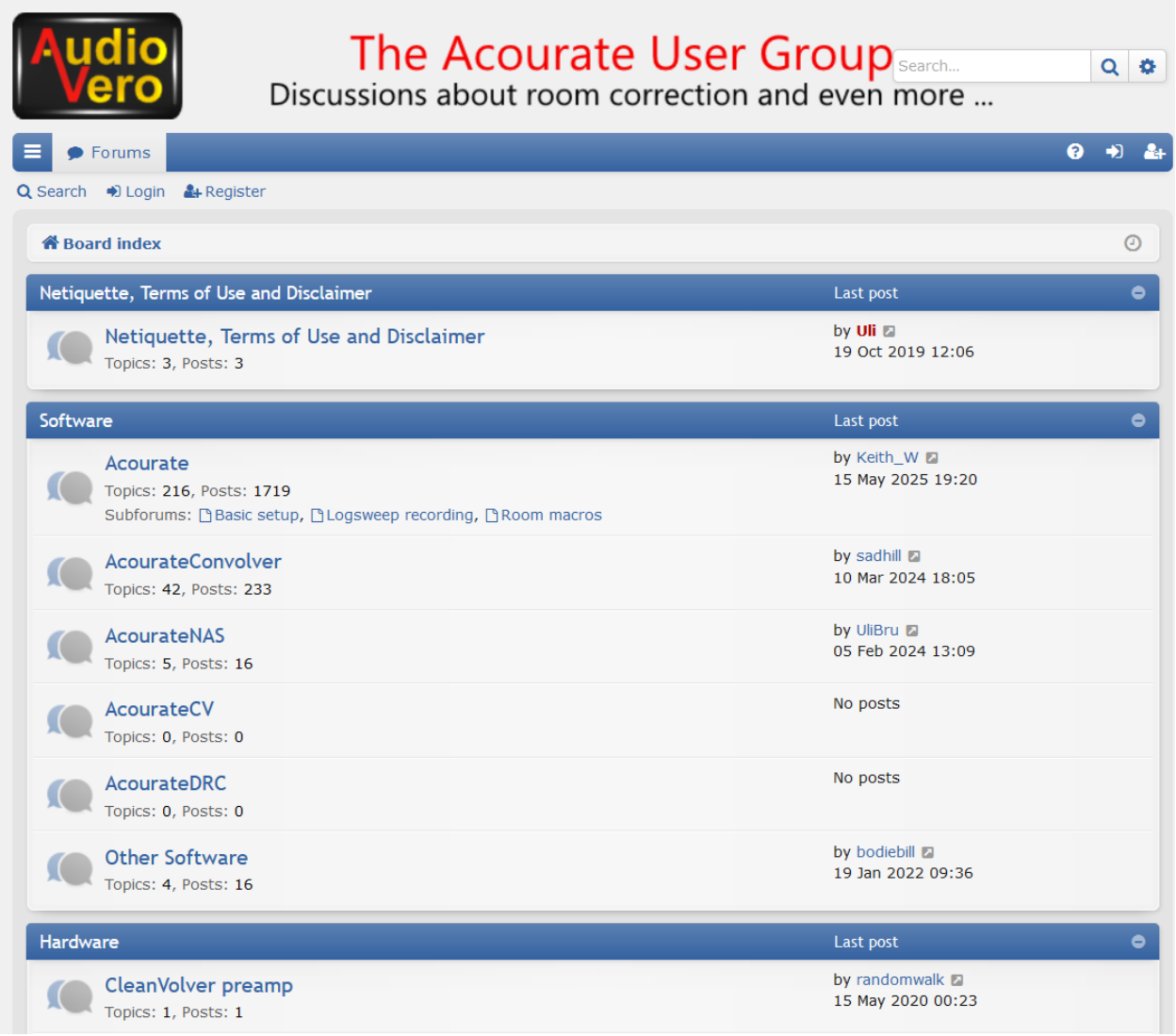
A million thanks to David for walking me through the entire process of setting up my ROON Server, taking initial speaker measurements with the Room EQ Wizard (REW), using Acourate to generate the FIR Filters, importing them in ROON and finally verifying the measurements in REW. He even helped me write these articles!

David is a patient and brilliant teacher. He is our local guru when it comes to technical issues.

10.

The Acourate User Group

https://www.audiovero.de/acourateforum/



11.

Acourate User Guides by Dr. Keith Wong

https://www.audiovero.de/acourateforum/viewtopic.php?t=410

VERSION 1: Acourate for DSP Controlled Active Speakers with Subwoofers
This is the advanced version of the guide, intended for users who wish to use Acourate to generate crossovers, perform time alignment, create VBA's, etc.

VERSION 2: Acourate for Passive Speakers with Optional Subwoofers
This is the beginner's version of the guide, intended for users who own passive speakers who may wish to integrate subwoofers into the system.

TARGET CURVES: Target Curves
This is a collection of target curves in Acourate's .DBL format suitable for use in Macro 2 (target curve design).

12.

Understanding the state of the DSP market by Dr. Keith Wong

https://www.audiosciencereview.com/forum/index.php?threads/understanding-the-state-of-the-dsp-market.62323/

13.

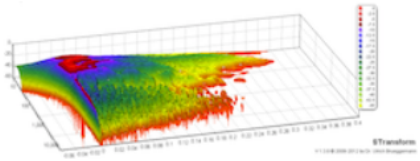
Acourate Digital Room and Loudspeaker Correction Software Walkthrough by Mitch Barnett.

https://audiophilestyle.com/ca/ca-academy/acourate-digital-room-and-loudspeaker-correction-software-walkthrough/

Acourate Digital Room and Loudspeaker Correction Software Walkthrough

★★★★★

Followers 5



In this article, I walk through the steps using Acourate to produce a default or baseline correction that is repeatable. By following the same steps, one should be able to achieve a similar baseline correction. This baseline correction is designed to provide the listener with a perceptually flat frequency response from 20 Hz to 20 kHz. Making the measurement and correction process predictable and repeatable is important to achieving a successful sonic result that one would be happy with.

Dr. Uli Brueggemann's Acourate (approx. $400 USD) is a high end audio toolbox with many functions. The Acourate web site provides a good description of the software solution:

"The sound arriving at the listening position is measured and analyzed. The quality of the direct sound is analyzed preferentially within an adjustable time window. In combination with a target function (adjustable by the user according to listening habits and preferences) a correction filter is calculated. The music signal will be corrected by the filter during playback. Thus an optimized sound will arrive at the listening position.

Low frequencies cause standing waves in any room, also described as room modes. Some frequencies will be boosted, others will be attenuated. The room correction avoids too loud playback levels by attenuating the corresponding frequency range. Weak levels will be boosted carefully to a higher level.

Acourate applies a psychoacoustic analysis to ensure correction filters fitting to the human ears.
Furthermore Acourate corrects timing errors of the room and the speakers by a phase correction. The target is to get as close as possible to an ideal step response, the best possible coherence, and similarity of response between the loudspeakers.
As a result the music reproduction is improved regarding tonality, sound stage, focusing, transparency, clarity, resolution and attention to detail."

14.

Advanced Acourate Digital XO Time Alignment Driver Linearization Walkthrough
by Mitch Barnett.

https://audiophilestyle.com/ca/ca-academy/advanced-acourate-digital-xo-time-alignment-driver-linearization-walkthrough/

Advanced Acourate Digital XO Time Alignment Driver Linearization Walkthrough

★★★★☆

Followers 5

In this article, I walk through the steps using Acourate to create a 3-way digital crossover (XO) for tri-amping my speakers. Additionally, using the audio toolbox functions of Acourate, I walk through the steps of time aligning the drivers, linearizing each driver, and performing a final room correction.

With respect to room correction, I recommend reading, "Acourate Digital Room and Loudspeaker Correction Software Walkthrough" for an introduction to Acourate. The article details the steps of acquiring a calibrated microphone, measuring the system, and designing a baseline room correction to provide the listener with a perceptually flat frequency response at the listening position.

My goal is to make this guide repeatable so anyone following the same steps should be able to achieve similar results. Using digital XO, time aligning and linearizing the drivers, and correcting the room's frequency and excess phase response, increases my systems imaging resolution so my speakers *disappear*.[PRBREAK][/PRBREAK]

The objective measure is called Interaural Coherence Coefficient (IACC) which is a measure of channel and room reflection equality for the first 80 milliseconds of sound travel. IACC is a common standard especially for describing the spaciousness of sound in concert halls. Uli's innovative use is in the opposite direction, to get a measure of channel and room reflection equality over time.

15.

Digital Room Correction with AudioVero's Acourate by Archimago

http://archimago.blogspot.com/2015/11/measurements-digital-room-correction.html

MEASUREMENTS: Digital Room Correction with AudioVero's Acourate...

A few months ago, I posted on the use of the free DRC software for audio room correction. I was already *very* impressed with what the technology is able to accomplish and wanted to explore this even further. In this spirit, I invested in a copy of (((Acourate))) from AudioVero. As I had mentioned previously, there are a number of other software/hardware packages to accomplish a similar task. While I'm sure other packages would do a fine job, as a JRiver user, I wanted to create WAV-based FIR filters like I did previously with DRC which I could import into the convolution DSP and Acourate allows me to do just that without needing to run any other plug-in.

16.

Updated Room MEASUREMENTS & MUSINGS on Importance of Sonic “Accuracy” and the Audiophile by Archimago.

http://archimago.blogspot.com/2016/05/updated-room-measurements-musings-on.html

Updated Room MEASUREMENTS & MUSINGS on Importance of Sonic "Accuracy" and the Audiophile.

Chapter I: Another Round of Room Measurements...

Recently, I acquired some more LP's, got a few more IKEA Kallax storage units for said LP's and put up some art as well. Here are front and rear shots of the sound room the other day...

17.

2019 Update: Basic Acourate DSP Room Correction by Archimago

http://archimago.blogspot.com/2019/10/2019-update-basic-acourate-dsp-room.html

2019 Update: Basic Acourate DSP Room Correction (using Dayton Audio EMM-6 mic, and other related bits...)

As I mentioned last time, I changed the tweeter in one of my speakers resulting in a significant adjustment to the frequency response in the 2-5kHz range. This means it's time to update my AudioVero **((acourate))** (current version 1.9.12, 286€) room correction filters for late 2019. Looking back, I haven't posted on this since 2016! My, how time flies.

Given that it has been awhile, picking up Acourate again for some measurements required that I dig out my old notes and review the previous procedures again. As such I figured that it was time to write an update for a reasonably "quick and dirty" measurement which basically took me an afternoon to perform with excellent results. If you've tried Acourate, you'll know that this program is very powerful but can take a bit of time to figure out the interface and get comfortable with the process.

Okay then, let's get going with a quick but detailed summary while it's fresh in my mind and provide some pointers the next time I might have to do this again maybe in a few years :-). We'll then end this post with a few other related subtopics that came out during the measurements...

18.

HOW-TO: Partial Frequency Correction with Acourate by Archimago

http://archimago.blogspot.com/2021/03/how-to-partial-frequency-correction.html

HOW-TO: Partial Frequency Correction with Acourate. Spotify HiFi coming and a look at the evolution of music sales/formats from 1980-2020.

[See Addendum update as of Acourate 2.0.]

Over the years, I've discussed the use of DSP room correction in these pages (here and here for the more recent articles). In *Acourate*, there's no single-step macro to tell the software to limit the correction to certain frequencies as far as I can tell. Instead, I saw this comment by Dr. Uli Brueggemann in one of Mitch Barnett's early articles (2013) hinting at a way to modify the inversion step of the filter to accomplish that task. This post is a step-by-step procedure for those interested in doing just such a thing with the software.

Note that even though I'm showing the process here, I'm certainly *not* suggesting that it's necessary whatsoever. In my listening, a full-spectrum room correction sounds great with the frequency-dependent-windowing (FDW) algorithm *Acourate* uses. Over the years with friends and family who have had the time to sit and listen, I have never had anyone complain that my usual full-spectrum filter did not sound better than the uncorrected sound in my room (and on occasion, I have measured and applied DSP to my friends'/family's sound systems as well to similar effect).

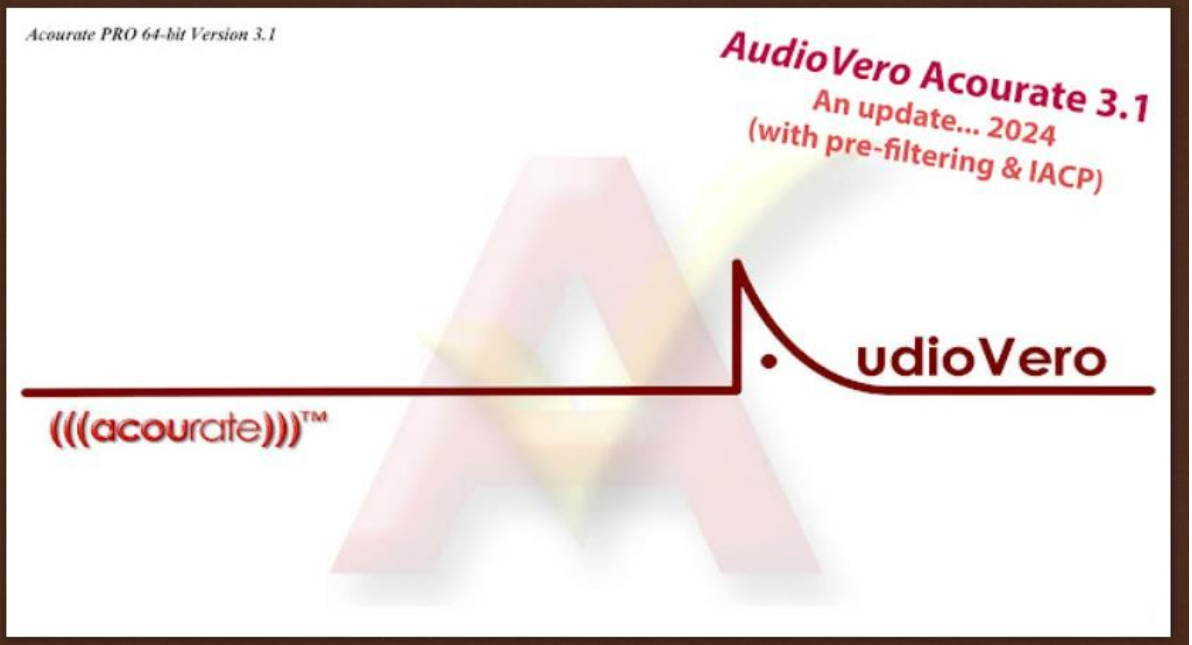
It's always great to have options though!

19.

AudioVero Acourate v3.1 – Room correction with bass pre-filtering and Inter-Channel Phase Alignment (ICPA) by Archimago

https://archimago.blogspot.com/2024/08/audiovero-acourate-v31-room-correction.html

AudioVero Acourate v3.1 - room correction with bass pre-filtering and Inter-Channel Phase Alignment (ICPA).



After writing the post on Audiolense recently, I thought it would be good to have another peek after a few years now at **AudioVero's Acourate** (€416 non-EU countries); the latest version 3.1 released in June 2024.

For years, Acourate has been the room-correction filter toolbox I've used (at least since 2016, updated 2019, plus discussion on partial correction in 2021). Now that it has been half a decade plus a pandemic (!) since the step-by-step 2019 update, let's look at the latest version which has brought with it changes in the user interface as well as the Inter-Channel Phase Alignment (ICPA) feature released in version 2 which I had not discussed previously.

Before getting started, a big thanks to Mitch Barnett of *Accurate Sound* for his *YouTube* video a couple years back using Acourate 2 showing the technique around pre-filtering and ICPA. I've taken inspiration from his video, applying it to my home set-up, and converting those steps into a written blog format for the current Acourate version. If what I'm doing here is not clear, make sure to also check out the video since Mitch might have already covered your questions/issues there.