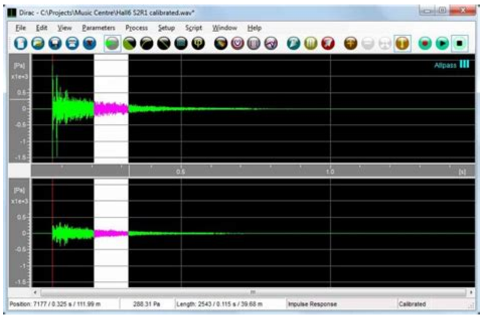
Dirac Software Manual



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Book Descriptions:

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Book Descriptions:

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The calibration tool is used to measure and generate filters while the audio plugin stores the corresponding filters and processes audio data. Please start with downloading and installing the audio plugin. You might need to go through additional steps to activate the plugin, depending on your DAW. It is important that the audio stream is active during the whole calibration process. Here is a 30 minutes mp3 that you can use. Make sure that your computer is connected to the internet for licensing purposes. You can click the “Rescan devices” icon in the upper left corner if you want to refresh the scanning result. Do not select any AVRs, because in this case, the Dirac Live audio plugin will function as the device that stores the filters. This is an important step, as too low or high volume can result in poor or failed measurements, and excessive volume could potentially damage the speakers. If you slowly increase the master output level, you should see the level bar for the selected speaker increases. If not, go back and check the microphone connection. To save the project, please select “Save project” in the hamburger menu upper left corner. Please return to the Volume Calibration step to reduce the gain of the corresponding speaker or master volume of the system. Please return to the Volume Calibration step to increase the gain of the corresponding speaker or master volume of the system. You can make fine adjustments to your preferences. The frequency response correction will be performed in real time so that you can see the correction result immediately and continuously make more adjustments. The dotted lines indicate the automatically detected sound thresholds. Outside of these limits no correction will be applied, i.e. the audio signal will not be adjusted in the frequency area on either side of the curtains shadowed area. Impulse response affects clarity, detail and all spatial aspects of the sound.http://ac-kenigsberg.ru/files/file/caldina-gtt-workshop-manual.xml

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Dirac Live’s unique impulse response correction can greatly improve staging, bass and clarity. The options are available in the lower right corner. Select a slot and save under the desired name there may be an autogenerated name, which can be replaced. When export is complete, the application will return to the Filter Design view. Remember to save your project before exiting the application. No other actions are needed to apply the filter to your audio stream. You should never change the device configuration while performing a room correction. It is named after P.A.M. Dirac, the father of relativistic electronic structure theory.Investigating solvent effects on the magnetic properties of molybdate ions MoO 4 2 with relativistic embedding, International Journal of Quantum Chemistry 2020 e26207 electronic version arXiv A Topological Data Analysis perspective on noncovalent interactions in relativistic calculations, International Journal of Quantum Chemistry 120 2020 e26133 electronic version arXiv The citation of DIRAC makes a distinction between authors and contributors, the former being active developers over many years who also do significant community service to keep the program in shape. This description certainly fits Andre Severo Pereira Gomes. Congratulations !Stay tuned for the 2019 release, scheduled for the end of the year ! All users are most welcome to join our mailing list. Jensen and Trond Saue, Relativistic quantum chemical calculations show that the uranium molecule U2 has a quadruple bond, Nature Chemistry 2018 online Energies for single electron detachment, attachment and electronically excited states J. Chem. Phys. 149, 174113 2018 electronic version arXiv Timo Fleig and Martin Jung. Modelindependent determinations of the electron EDM and the role of diamagnetic atoms. J High Energy Phys JHEP 07 2018 012 Congratulations, Luuk !!! Second row Martin van Horn, Amsterdam;

Pi Haase, Groningen; Andre Gomes, Lille. Third row Hans Jorgen Aa.http://stroisvias.ru/userfiles/calderas-myrggo-manual.xml

Jensen, Odense; Trond Saue, Toulouse; Tjerk Straatsma, Oak Ridge. From left Loic Halbert, Lille; Radovan Bast, Tromso; Eugene Gvozdetsky, Amsterdam; Gosia Olejniczak, Warsaw; Miroslav Ilias, Banska Bystrica; Luuk Visscher, Amsterdam.Jensen, Odense; Yongliang Hao, Groningen; Eugene Gvozdetsky, Amsterdam; Tjerk Straatsma, Oak Ridge; Pi Haase, Groningen; Martin van Horn, AmsterdamAn efficient relativistic densitymatrix renormalization group implementation in a matrixproduct formulation. J. Chem. Theory Comput. 14 2018 2353 electronic version Fourcomponent Polarization Propagator Calculations of Electron Excitations Spectroscopic Implications of SpinOrbit Coupling Effects. J. Chem. Theory Comput. 14 2018 1510 electronic version We are happy to announce the release of DIRAC17, the latest version of the. DIRAC code for 2 and 4component relativistic molecular electronic structureGet a DIRAC17 license here.The release date will be Dec 12 2017. Stay tuned !J. Chem. Phys. 146, 224101 2017 From L to R Tapen Roy, Prof. S.N. Bose, Prof. P.A.M. Dirac, Prof. Gagan Behari Bandopadhyay, and Purnima Sinha. J. Chem. Theory Comput. In press electronic version Phys. Chem. Chem. Phys. 19 2017 8400 electronic version We are happy to announce the release of DIRAC16, the latest version of the. DIRAC code for 2 and 4component relativistic molecular electronic structureGet a DIRAC16 license here.Stay tuned !Photographer Trond Saue ToulouseNuclear size effects in vibrational spectra TaN, a molecular system for probing P,Tviolating hadron physics We are happy to announce the release of DIRAC15, the latest version of the. DIRAC code for 2 and 4component relativistic molecular electronic structureGet a DIRAC15 license here.Jensen Odense, Avijit Shee Toulouse, Benjamin HelmichParis Amsterdam, Tiago Teodoro Amsterdam, Andre Gomes Lille. Also present Adel Almoukhalalati Toulouse, Stanislav Komorowsky TromsoAs usual kindly hosted by SDU in Odense.

Measurement of the first ionization potential of lawrencium, element 103. We are happy to announce the release of DIRAC14, the latest version of the. DIRAC code for 2 and 4component relativistic molecular electronic structureNew features are listed here. Get a DIRAC14 license here.Front row Trond Saue Toulouse, Avijit Shee Toulouse, Stanislav Komorovsky Tromso. Hans Jorgen Aagaard Jensen Odense, Carlos Gimenez Corrientes. Second row Andre Gomes Lille, Roberto Di Remigio Tromso, Mickael Hubert Odense. Timo Fleig Toulouse, Erik Donovan Hedegard Odense. Third row Kenneth Ruud Tromso, Michal Repisky Tromso, Paul Bagus Denton, Radovan. Bast Stockholm, Luuk Visscher Amsterdam, Agustin Aucar Corrientes. Also present Elke Fahauer Heidelberg, Stefan Knecht ZurichPaul Bagus Denton, Avijit Shee Toulouse, Agustin Aucar Corrientes, Carlos Gimenez Corrientes. Mickael Hubert Odense, Hans Jorgen Aagaard Jensen Odense, Lucas Visscher Amsterdam, Michal Repisky Tromso, Stanislav Komorovsky Tromso. Andre Severo Pereira Gomes LilleWe are happy to announce the release of DIRAC13, the latest version of the. DIRAC code for 2 and 4component relativistic molecular electronic structureGet a DIRAC13 licenseJensen, Radovan Bast and Trond Saue, Gauge origin independent calculations of molecular magnetisabilities in relativistic fourcomponent theory, Mol. Phys. 111 2013 1373 Trygve Helgaker special issueFront row Elke Fahauer Heidelberg, Carlos Gimenez Corrientes, Markus Pernpointner Heidelberg, Trond Saue Toulouse; Second row Hans Jorgen Aagaard Jensen Odense, Anatoly Titov St.Get a DIRAC12 license. This process will take approximately 60 minutes. Later in the process, if the DIRAC program constantly gives “Level to Low” errors, pull the mono to stereo adapter ever so slightly out of the USB dongle to get a better connection. Please be aware that you may be required to configure your computer’s microphone settings.

http://www.bouwdata.net/evenement/boss-chaos-c700-manual

It should automatically find your NAD product on your networkThe recording device is where you have connected microphone earlier.It will have its own config file or download site. A browse window will ask for the Microphone Correction file. You will see a range of green bars while the test tone is playing, try to adjust the level as high as possible without it turning red red. Click the Test Button again to stop the test tone once completed. Chair and Sofa are available by default. A DIRAC Pro license will open more options; This should be the primary listening position illustrated in the DIRAC program.It will finish with the left speaker a second time. If it completes successfully without errors, the program will move you on to next steps Use this as a reference for future measurements of this installation. If you want to make changes, you won't need to perform a new signal sweep unless something in your room has changed such as moving a speaker or rearranging the furniture. You can access saved filters using the Home Main Menu icon in the DIRAC App. The DIRAC default curve is loaded of making all tones as even as possible.The front panel of the NAD Product will say "Saving Filter". This keeps radio interference of the Wifi signal at a minimum when performing measurements. The NAD T777V3 and M17V2 also have a wired network port if a wired connection can be used. Any changes to the configuration of your NAD Product will override DIRAC and turn off any filters as they no longer match the setup it was designed for. For example, If you add Height Channel speakers, they were not part of the original calibration. DIRAC can't be forced back on. A new calibration will need to be performed, or the added channels must be disabled. A mini or fullsize tripod is very helpful here. The software must be able to communicate with DIRAC HQ for proper filter creation.

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Please review your third party microphone documentation for calibration instructions These should be disabled before proceeding with the DIRAC calibration. Submit a request. In this article, I walk through the steps of using Dirac to optimize the response of the Purifi SPK4 demo kit that I recently reviewed here on Audiophile Style.And by better I mean smoothing out the low frequency response below the room's transition Schroeder frequency, making small, broad band tonal adjustments in the midrange and top end to be a bit smoother and finally a timing correction of the impulse response.We can see the improvement in the measured frequency and timing response. I can also hear an audible difference with a tighter, more clear sounding bass, smoother overall frequency response and a more coherent timing response i.e. stereo imaging and depth of field across a larger sweet spot. The sonic benefits are instant, much smoother bass response with no huge peaks and dips that plague virtually every room below Schroeder frequency. Full range correction comes with improved phase response i.e. imaging and depth of field covering a wider sweet spot, more on that in the subjective listening section.The unfortunate reality is that below a room's transition a.k.a. Schroder frequency, the room controls the bass response arriving at your ears, not the loudspeakers. Due to modal resonances we get wildly different bass responses depending on where we place speakers in rooms relative to the listening positionAs Floyd says, "In the investigation of many rooms over the years, I would estimate that something like 80% have serious bass coloration." For those of us that take acoustical measurements of audio systems, this comes as no surprise. The peaks and dips in the low frequency response is typical and exists in virtually every room that was not specifically designed using proper room ratios, aside from construction and acoustic treatments.

http://atmos-service.com/images/Difference-Between-Manual-And-Automatic-Transmission-In-Car.pdf

I like this Room Mode calculator as you can move the cursor along the frequency scale and it will output a tone at that frequency. If your computer is hooked up to your speakers careful with the volume!, you can hear the resonances in your room by hovering the cursor over the modes in the graph. It is an ear opening experience and great for training ones ears to know what to listen for.Or the "where did the bass go" when certain bass notes are played. Or simply just uneven bass, some notes are there, some are gone, and some are too loud.Our ears are more sensitive to peaks than dips. A good primer on why we hear what we hear in small room acoustics as it relates to room correction is James JJ Johnston's, " Acoustic and Psychoacoustic Issues in Room Correction." Download the PowerPoint if you can. The first 31 slides are worth the read.The white paper linked goes into detail behind the design, and can be summarized asIn particular, we strive to reduce the “preringings” preechoes that would otherwise result in an unnatural sound experience. This is important for obtaining a robust design that works over an extended region to provide a large spatial area with good sound quality. This is done by precise phase control of the individual loudspeaker transfer functions at low frequencies. Joint optimization of a set of loudspeakers results in more distinct bass performance, better robustness of the compensation and better control of the impulse responses at different listening positions. ”If there is interest, I might write another article to discuss this in more detail as it is not just “eq” that is being applied here i.e. the time domain properties are equally important.The Dirac Live Processer DLP is a VST plugin that “hosts” the correction filters in a convolution engine. The Dirac Live application is used to measure your loudspeakers in your room, design the filters, and upload the correction filters to the DLP.

In this article, I am using JRiver Media Center 64 Bit DSP audio architecture to host the DLPHere we are seeing the DLP loaded into JRiver and active with a correction uploaded into the first of eight slots available.Note that you are required to login to your Dirac Live account in order to connect to the DLP. Also, in order for the Dirac Live application to communicate with the DLP, the latter needs to be enabled and actively receiving an audio signal. Meaning that the DLP is enabled in JRiver and music is playing through Dirac Live Processor so it is “active.” Without the DLP being active, the Dirac Live application cannot connect to the DLP.It is concise and well written so you can quickly get the hang of what to do. Here we are selecting which recording device to use once we clear the instructionsI have clicked into the area with the red square and loaded my measurement mics calibration file. In my case, the mic calibration file uses comma separated text whereas Dirac is expecting periods. Easy enough to open in a file editor and replace commas with periods. In most case, like using a UMIK1 mic, the microphone calibration file will load without any calibration file modifications.If you feel like covering your ears, then it is too loud.These involve taking multiple measurements, the number of which depending on what type of listening arrangement is selected. The wider the listening area to cover the more measurements one needs to take. So it could be as few as 5 measurements and as many as 17This is so I could also subjectively compare the two corrections. First lets walkthrough the single chair selection.The idea is that you move the microphone relative to the placement as indicated in the diagram. In general, the mic placement is 40 to 60cm apart per placement and you can choose whatever order you want take the measurements by clicking into the location on the diagram. Note that the precise placement of the mic to the location is not crucial.

We measure and correct for the loudspeaker and room with an unobstructed path and nothing around the microphone so we are getting a clean as a sound field as possible. We don’t want to correct for any reflections between the speakers and mic due to a coffee table or around the mic itself as that will lead to a colored sound. It is best to measure and correct for the unobstructed sound field first and then return the furniture to its original locations. Finally, I recommend getting a real boom mic stand for taking measurements. You can grab one at your local music store or order online. The little mic stand that comes with the UMIK1 while cute, is not helpful as you need to place it on something to get ear height, which means reflections i.e. colorations are getting into the mic.So 3 sweeps per location times 5 locations equals 15 sweeps Generally speaking, one is looking for a downward tilt of the frequency response at the listening position. This is because most forward firing drivers in loudspeakers start off as omnidirectional at low frequencies and become progressively more directional at higher frequencies. The rising bass energy yields a steady state room curve with a downward tilt. A high level overview of that can be found in, The History of the Harman Target. While the overview also discusses headphone target curves, which have the same preferred target transfer function as loudspeakers in rooms, it also discusses loudspeaker target preferences. More importantly, there are a listing of AES papers that one can get the details on. One example is the Subjective and Objective Evaluation of Room Correction ProductsNote that a flat inroom response is not the ideal target response as it will be exceedingly bright sounding. If you read through Sean Olive's presentation referenced above, and in these slides, it is actually the tilting frequency response that our ears perceive as flat or neutral sounding at the listening position see slide 25. Well worth the read.

Outstanding for such a small 2 way bookshelf speaker. Ctrlclick both checkboxes, top right to get both curves to display.In fact, having been using room correction since 2011, and having seen many other people's measurements of loudspeakers in rooms, 600 Hz seems to be the most common point where the room starts to have an influence on the frequency response and gradually taking over completely by the time one reaches the rooms transition frequency, which in my room is at 200 Hz. As linked earlier, you can use this room mode calculator to calculate your room's transition frequency.Dirac has already calculated the correction in the background and by unchecking the measurement and checking on the correction, we getSo not only smoothing out below 600 Hz, but also bringing down the broadband rise from 2 kHz to 5 kHz when compared to the original measure. Still a little dip left at 100 Hz, but as folks may have read in JJ's presentation, our ears are not as sensitive to narrow band dips as compared to peaks, so all good. Note the very slight channel level difference in the top end frequency response.I can give it a name and descriptionI also adjusted the gain slider to about 6 dB for headroom management. The meters will peak red if there is any clipping, which I experienced none. I could probably go to 3 dB of headroom management, but I have plenty of power on tap.But before I comment on the sound, I also wanted to try a partial correction to 600 Hz as can be seen as a foreshadow in slot 2 OCreating a partial correction is dead easy. All I need to do is grab the right marker that was previously at 22.1 kHz and drag the marker to the left to about 600 HzNote, if I were using Dirac and Digital Room Correction for the first time, this is where I would suggest starting with a partial correction. This way one can focus your attention on just listening for an improved bass response and not a change in overall frequency response. I did not use a measuring tape.

I just took a guess as to where the mic should go at each location, either raising or dropping the mic height and placing the mic at the front or back of my sofa, which I have temporarily moved out of the way. Note these 17 measurements covered a 6ft wide x 2ft deep x 2ft of height variability where my couch is.Again we proceed to filter design. I just used the same default target as before and then switching to the corrected filter responseTo give an idea of all of the responses around the area, Dirac has a "spread" feature that allows you to see this if you check the box in the lower right handOne can see the variability of the measurements based on position and again, by about 500 Hz, there is less variability as the loudspeaker is in control of the frequency response and not so much the room.As one can see on the left, the impulse or transient response is a cleaned up version of the measurement. Vertical scale is amplitude and horizontal scale in milliseconds. The smaller spikes, after the direct sound are early reflections. The corrected impulse response shows a clean spike and very little spikes i.e. early reflections after. Given multiple measurement locations, one can understand that the sound and reflections arrive at different times and in different ways depending on the mic location relative to the loudspeakers. Using the concept of superposition and what we know about the physics of how standing waves respond in a rooms, we can work out the pattern and therefore correct for a wider sweet spot, which is what the 17 measurements are about. Dirac knows the phase relationships between the measurements plus taking the speakers as a pair into account, is used to calculate the correction filter.While I have been using Dirac's suggested target curve based on the measurements, you are free to create your own target curves.

As mentioned above in the Subjective and Objective Evaluation of Room Correction products, the most preferred or accurate or neutral response is one that is 20 Hz to about 8 or 9 dB at 20 kHz. Of course, one can add and delete control points along the target right click on the target. One can also save and load targets from the menu at the top left, beside the help icon.It is not a lot, but is an audible difference. Just my personal preference. Of course, export to DLP and start listeningBefore we get to the subjective listening section, here are a couple of “spot” verification measurements I made with REW.It is a loopback measurement where I am feeding the digital output of REW sweep test tone into the JRiver’s ASIO digital line input and it passing through Dirac Live Processor with the correction engaged and fed out my Hilo DAC to the Purifi amp and speakers, picked up by the measurement mic, through a mic preamp, Hilo ADC and routed to REW’s digital input. Then the measurement can be displayed in a variety of graphs to look at different viewpoints of the acoustic measurement of the room and loudspeakers. This is not a “gated” measurement as we do want the room’s low frequencies in the picture and using REW’s default impulse window of 500 milliseconds.Ideally, I would take 17 measurements at the same or similar locations as I did in Dirac and vector average them in REW. And even then it still will not be quite the same as Dirac is applying more than just a vector average. However, it does verify that Dirac is doing what it is supposed to doThe speakers are in a 9ft equilateral triangle. I just split the screens apart to make it an easier comparison. Let’s start with the low frequency response and work our way up to the high frequencies, calling out the differences.Compare that to 3 dB down at 32 Hz on the left and 45 Hz for the right speaker without correction.

This is in addition to being smoother and less peaky at 36 Hz for the left uncorrected speaker and 55 Hz for the right uncorrected speaker. Remember, our ears follow the “envelope” of the frequency response with our ears more attuned to peaks rather than narrow dips in frequency response.The total swing from the lowest point at 90 Hz to the highest point at 110 Hz is 23 dB. To our ears, a bass note playing at 90 Hz will be.This is classic room modes and we all got em, albeit at different frequencies dependent on one’s room ratio. I suspect it would be in this range if I vector averaged 17 measurements in REW. Good enough for a spot check.Finally, we extend the response a bit past 10 kHz. From good to great goes the speaker’s inroom frequency response, not only smoother but extended on both ends of the frequency spectrum.Dirac makes a claim that “misaligned drivers in multiway loudspeakers can be corrected by automatically applying different delays to different frequency ranges.” So let’s verify this claim by first looking at the step response of the uncorrected Purifi SPK4However, not truly time aligned. Claim verified. There is just a hint of preringing at the beginning of the step response. I know it is not audible, as I have experimented in detail with greatly exaggerated preringing examples in my book, “ Accurate Sound Reproduction using DSP.” Completely innocuous with the main goal of time alignment of drivers achieved.Excess phase correction in the low frequency response is audible to my ears as is time alignment of drivers. Perhaps a future article on more discussion around this, but suffice to say, Dirac is doing its job in the time domain.I did have to check a couple of times as the amount of sub 30 Hz output from the Purifi’s PTT6.5” subwoofer is astonishing. However, I do intend to use the subs in Part 2 of using Dirac Live Bass Management in an upcoming review.This makes it easier to hear the room’s resonances.

As expected, there are some bass notes that practically disappear and other bass notes that dominate the sound in my room.It is still amazing to me as when I was working in recording studio control rooms, the only way to control room modes was the geometric and acoustic design of the control room. Aside from the room controlling reflections and acoustic treatments, the bass traps required to deal with very low frequencies at long wavelengths meant for a special acoustic design a room within a room. The bass would pass through the shell of the inner room and be “trapped” in the outer shell so as not to pass back into the inner room. You can imagine the construction costs. Now at the flick of a digital switch, for truly a fraction of the cost, one can have the same smooth solid bass response at every frequency. What a time to be alive!A very nice Bob Katz recording and master of an acoustic bass guitar, in addition to Rebecca’s wonderful vocal rendition. Spanish Harlem, in the key of G, uses the classic 1, 4, 5 progression. Here are the frequencies of the fundamental notes of the bassWhen your ears starting tuning in, it really becomes apparent the differences. Having nice solid, even sounding bass arriving at your ears is a real treat. The reason why I say our ears need to tune in is because we are so used to listening to uneven bass, we are simply used to it and don't give it a second thought. Remember JJ's presentation. But once you hear how smooth it can be with your existing loudspeakers in your room, it is impossible to go back. Just the ability to smooth out the bass response is well worth the price of the software, aside from the additional benefits we are about to discuss.I find it a great boon being able to switch on and off DLP while listening in real time. There is no delay or interruption of sound or glitches of any sort, just a smooth and transparent switch.

This makes is really easy to compare uncorrected to corrected or comparing different correction filters. This makes it easy to hear the differences instantly and then appreciate them over a period of time.It was the first song and first take of the recording for the album that captured the feeling so well. When I was recording, I was always trying to get bands to "practice" before we recorded, but I was secretly recording as invariably the first take is sometimes the best take. Case in point this tune, wow!Great bass line that sounds nice and smooth with Dirac enabled. It sounds so clear and precise with Dirac enabled, almost spooky hearing SRV fingers sliding up and down the strings with the Leslie effect enabled. Goosebumps territory.I wanted to see if the 5 measurements versus 17 measurements were audible in some way to my ears. I found the changes to be subtle with the 17 measurements offering a bit more clarity in the overall sound, especially moving to edges of my couch area. I must say the phantom center image was perfect between the speakers, no wandering of the center image versus frequency. Excellent spatial imaging with a 3D depth of field I only hear from speakers that are time aligned with both channels closely matching in frequency response.While I enjoyed the benefits of partial correction, my preference is for the full range correction in two areas. One advantage was smoothing any midrange and high frequency "peaks" which with the Purifi SPK4 demo kit were small, but makes a difference not only in the smoothness of the sound, but also the vocals and instruments in the midrange "sat" in the overall mix where I thought they should be rather than sitting in front of the mix being a bit forward in sound from 2 kHz to 5 kHz region.Personally, I find most speakers sound too "bright" to my ears and confirmed by my measurements.

https://www.interactivelearnings.com/forum/selenium-using-c/topic/16907/boss-chaos-c700-manual