

RAP-1 Room acoustic processor



The world's first non DSP architecture room acoustic processor

RAP-1 is the first room acoustic phase correction system with FIR filter instead of DSP architecture in the world.

After sampling the acoustic measurement of a single point or multiple points through the measuring microphone, the data analysis is carried out for the various phase superposition or cancellation caused by the sound wave reflection played by the speaker in the room, and the unique FIR filter coefficient is generated, and then the sound phase is corrected as a whole.

The biggest characteristic of RAP-1 is that it abandons the DSP architecture based on serial computing and adopts the high-speed FPGA processing platform with parallel algorithm. Our FIR filter processes each frequency and phase more than 8192 Tap, and the time spent is only 1% of that of DSP architecture, which ensures that there will be no new phase distortion in the digital processing.

ACCURATE

High precision full FIR phase correction.

The sound that people hear in the listening area is the collection of "direct sound" and "reflection sound". However, because the reflected sound and direct sound always arrive at the listener's ear at different times, the direct sound and various reflected sound will interfere with each other due to the time difference, and the in-phase sound will be superimposed, The opposite phase of the sound will produce cancellation, and the superposition and cancellation will distort the original flat frequency response characteristics.

RAP-1 uses a special acoustic algorithm to calculate and analyze the acoustic phase data sampled from the microphone, and uses the minimum phase FIR filters (minimum phase FLR filters) at 4096 TAP per channel to accurately correct the phase and frequency characteristics in the 20-20KHz frequency band, so as to ensure that the correct and straight frequency response and phase characteristics can be obtained in the listening area, Improve the definition of direct sound, reduce the interference of space reflected sound to the minimum, get rid of the uncontrollable room acoustic defect interference, and return you an accurate, real, clear and powerful low frequency. After processing, the stereo sound field positioning is more accurate, and the stage space feeling is more broad and profound.



REAL TIME

Processing delay as low as 0.25 ms

Due to the huge delay of traditional DSP serial algorithm architecture for high-order fir phase correction processing, most audio processors based on DSP architecture still adopt the processing mode of IIR + low-order filter, especially for the low-frequency band below 100Hz, the phase distortion is still very large. RAP-1 abandons DSP architecture and adopts high-speed FPGA platform based on parallel algorithm. 8096 tap logic gate performs FIR coefficient processing at the same time, which is equivalent to 512 DSP chips working at the same time. The processing speed is only 1% of that of traditional DSP audio processor, which avoids the new clock distortion and phase distortion caused by high latency in the processing process.

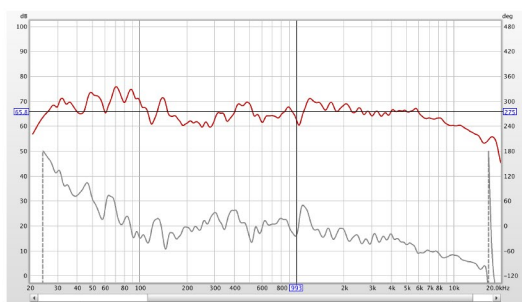


EASY

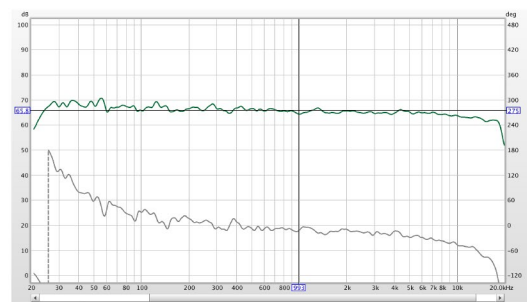
Easy to use operation interface

After RAP-1 is connected to the router through the network cable, the notebook computer can control it wirelessly through the WLAN. The software does not need complicated installation procedures, and it can be opened directly by clicking.

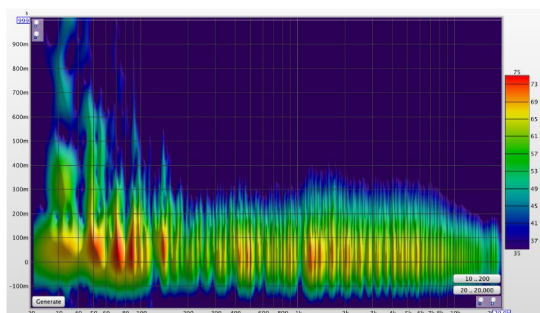
Simple single page operation interface, users only need to place the measurement microphone, click on a few simple steps on the software interface to complete the measurement operation and optimization processing. There is no complex setting process, no need for additional professional measurement equipment to assist and receive professional knowledge training. Ordinary users can master it skillfully, making professional acoustic calibration more simple and intelligent.



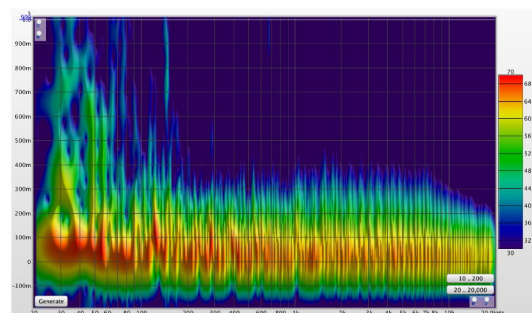
Fréquence and phase before



After



Direct sound energy distribution before



After

Advanced electronic X-cover function.

It can be used for two-way or three-way electronic frequency x-cover.

RAP-1 is a 6-channel stereo output design, which can be set as stereo, stereo + subwoofer, and stereo 2-way, stereo 3-way system.

Without complicated setting adjustment, you only need to specify the frequency division point and adjust the appropriate output level according to the sensitivity of each loudspeaker. RAP-1 will automatically optimize the frequency division characteristics for the most accurate.

Because it is based on the feedback of the measured microphone, and through the advanced acoustic algorithm and high-order FIR filter to optimize the speaker system, it can get the best connection between the speakers of the multi-channel speaker system, so it has a sound incomparable to the traditional analog or ordinary DSP digital frequency divider.

Adjust to your favorite sound

The frequency response curve can be adjusted freely according to personal preference.

After RAP-1 optimization, it will provide you with a flat frequency response curve. On this basis, you can adjust your favorite timbre characteristics according to your own preferences by setting the fir EQ curve.

Compared with the traditional IIR parameter EQ, fir EQ has no phase distortion and will not bring new phase distortion due to over adjustment, so as to bring you a balanced adjustment without distortion and timbre pollution. You can adjust according to your own preference as you like without worrying about damaging the corrected phase characteristics

RAP-1 Specification

• Digital input	AES/EBU×1@75 OHM
• Work Clock Input	1×BNC@75 OHM 3Vpp on BNC 32-192K
• Work Clock Output	1×BNC@75 OHM 3Vpp on BNC 32-192K
• Analog Input	XLR×2
• Analog Output	XLR×6
• Frequency	10-30000Hz±0.3dB
• Dynamic range	24bit>120dB
• Singal noise	>110dB
• Sample Rate	44.1 , 48 , 96 , 176.4 , 192KHz
• AC Power	220V/110V , Max 25W
• Dimensions	101.8(H)*480(W)*319.5(D)mm
• Shipping dimensions	232(H)*656(W)*490(D)mm
• Net weight	9.4Kg /each
• Shipping weight	13Kg /each

RAP-1^{SE} Specification

• Digital input	AES/EBU×1 @75 OHM
• Work Clock Input	1×BNC@75 OHM 3Vpp on BNC 32-192K
• Work Clock Output	1×BNC@75 OHM 3Vpp on BNC 32-192K
• Analog Input	XLR×2 , RCA×2
• Analog Output	XLR×6 , RCA×6
• Frequency	10-30000Hz±0.3dB
• Dynamic range	24bit>120dB
• Singal noise	>110dB
• Sample Rate	44.1 , 48 , 96 , 176.4 , 192KHz
• AC Power	220V/110V , Max 25W
• Dimensions	101.8(H)*480(W)*319.5(D)mm
• Shipping dimensions	232(H)*656(W)*490(D)mm
• Net weight	9.7Kg /each
• Shipping weight	13.9Kg /each

